Draft Environmental Impact Report

751 Gateway Boulevard Project

City of South San Francisco, California
State Clearinghouse No. 2020010281

Draft EIR Publication Date: September 22, 2020
Draft EIR Public Hearing Date: October 15, 2020
Draft EIR Public Comment Period: September 22–November 8, 2020

Written Comments Should Be Sent:

City of South San Francisco
Economic and Community Development Department
315 Maple Street
South San Francisco, California, 94080
Contact: Adena Friedman
(650) 877-8535
adena.friedman@ssf.net

State Clearinghouse No. 2020010281

September 2020

ICF

ICF. 2020. *751 Gateway Boulevard Project*. Draft Environmental Impact Report. September. (ICF 0662.19.) South San Francisco, CA. Prepared for the City of South San Francisco, CA.

Draft Environmental Impact Report

751 Gateway Boulevard Project

City of South San Francisco, California
State Clearinghouse No. 2020010281

Draft EIR Publication Date: September 22, 2020
Draft EIR Public Hearing Date: October 15, 2020
Draft EIR Public Comment Period: September 22–November 8, 2020

Written Comments Should Be Sent:

City of South San Francisco
Economic and Community Development Department
315 Maple Street
South San Francisco, California, 94080
Contact: Adena Friedman
(650) 877-8535
adena.friedman@ssf.net

State Clearinghouse No. 2020010281

September 2020

ICF

Contents

Tables

Figures

Acronyms and Abbreviations

$\mu g/m^3$	micrograms per cubic meter
AB	Assembly Bill
ABAG	Association of Bay Area Governments
ADA	Americans with Disabilities Act
AIA	Airport Influence Area
ALUC	San Mateo County Airport Land Use Commission
ALUCP	Airport Land Use Compatibility Plan
ALUCs	Airport Land Use Commissions
AMS	alternate mode share
amsl	above mean sea level
APNs	Assessor's Parcel Numbers
BAAQMD	Bay Area Air Quality Management District
BART	Bay Area Rapid Transit
BC	Business Commercial
BCDC	San Francisco Bay Conservation and Development Commission
bgs	below ground surface
BMPs	best management practices
BTU	British thermal unit
C/CAG	City/County Association of Governments
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CAFÉ standards	Corporate Average Fuel Economy Standards
cal BP	calibrated years before present
CAL FIRE	California Department of Forestry and Fire Protection
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
CalRecycle	California Department of Resources Recycling and Recovery
Caltrans	California Department of Transportation
CAMUTCD	California Manual on Uniform Traffic Control Devices
CAP	Climate Action Plan
CARB	California Air Resources Board
CCAs	Community Choice Aggregators
CCR	California Code of Regulations
CCR	Code of Regulations
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission

CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CH_4	methane
CMA	Congestion Management Agency
CMP	Congestion Management Program
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPPA	California Native Plant Protection Act of 1977
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CPUC	California Public Utilities Commission
CRHR	California Register of Historical Resources
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibel
dBC	C-weighted decibel
DPM	diesel particulate matter
DTSC	Department of Toxic Substances Control
EIR	Environmental Impact Report
EO	Executive Order
EPA	Environmental Protection Agency
ESPs	energy service providers
FAA	Federal Aviation Administration
FAR	floor area ratio
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GHG	greenhouse gas
GSAs	Groundwater Sustainability Agencies
GSPD	Gateway Specific Plan District
GSPs	Groundwater Sustainability Plans
GWP	global warming potential
HBW	home-based work
HFCs	hydroflourocarbons
HI	hazard index
HRA	health risk assessment

HVAC	heating, ventilation, and air conditioning
Hz	hertz
IOUs	investor-owned utilities
IPaC	Information for Planning and Consultation
IPCC	Intergovernmental Panel on Climate Change
IRP	2018 Integrated Resource Plan
ITE	Institute of Transportation Engineers
kBTU	thousand BTU
kW	kilowatt
kWh	kilowatt hour
L_{dn}	day-night level
LEED	Leadership in Energy and Environmental Design
L_{eq}	equivalent sound level
LID	Low-Impact Development
L_{max}	maximum sound level
L_{min}	minimum sound level
LOS	Level of Service
LRA	Local Responsibility Area
MBTA	Migratory Bird Treaty Act
mg/m^3	milligrams per cubic meter
MPOs	Metropolitan Planning Organizations
MRP	Municipal Regional Permit
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NCP	National Contingency Plan
NDCs	Nationally Determined Contributions
NHTSA	National Highway Traffic Safety Administration
NO	nitric oxide
NO_2	nitrogen dioxide
NOC	Notice of Completion
NOD	Notice of Determination
non-VHFHSZ	Non-Very High Fire Hazard Severity Zone
NOP	Notice of Preparation
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NWPR	Navigable Waters Protection Rule
O_3	ozone
OEHHA	Office of Environmental Health Hazard Assessment
OPR	Office of Planning and Research

OSHA	Occupational Safety and Health Administration
PCBs	polychlorinated biphenyls
PCE	Peninsula Clean Energy
PCWQCA	Porter-Cologne Water Quality Control Act
PPV	peak particle velocity
PFCs	perfluorocarbons
PG&E	Pacific Gas and Electric
PM	particulate matter
ppb	parts per billion
ppm	parts per million
R&D	research and development
RECs	Recognized Environmental Conditions
RHNA	Regional Housing Needs Allocation
RMS	root mean square
ROGs	reactive organic gases
RPS	Renewables Portfolio Standard
RTPs	Regional Transportation Plans
RWQCB	Regional Water Quality Control Board
SAFE	Safer Affordable Fuel-Efficient
SamTrans	San Mateo County Transit District
SB	Senate Bill
SCS	Sustainable Communities Strategy
SF_6	sulfur hexafluoride
SFBAAB	San Francisco Bay Area Air Basin
SFO	San Francisco International Airport
SFPUC	San Francisco Public Utilities Commission
SGMA	Sustainable Groundwater Management Act
SLCP	short-lived climate pollutant
SMCEHD	San Mateo County Environmental Health Department
SMCWPPP	San Mateo Countywide Water Pollution Prevention Program
SO_2	sulfur dioxide
SRAs	State Responsibility Areas
SSFFD	South San Francisco Fire Department
SSFPD	South San Francisco Police Department
SSFUSD	South San Francisco Unified School District
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TACs	Toxic Air Contaminants
TAZ	Transportation Analysis Zone

TDM	Transportation Demand Management
TPAs	Transit Priority Areas
U.S. 101	U.S. Route 101
USACE	U.S. Army Corps of Engineers
USC	United States Code
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UWMP	Urban Water Management Plan
VHFHSZs	Very High Fire Hazard Severity Zones
VMT	vehicle miles traveled
WDRs	Waste Discharge Requirements
WEAP	Worker Environmental Awareness Program
WETA	Water Emergency Transportation Authority
WSA	Water Supply Assessment

Chapter 1
Introduction

This chapter summarizes the 751 Gateway Boulevard Project (proposed project), outlines the purpose of this Environmental Impact Report (EIR), summarizes the environmental review process, and describes the organization of the draft EIR.

1.1 Project Summary

The project sponsor, 701 Gateway Center LLC, proposes to redevelop a 7.4-acre, irregularly shaped site within the City of South San Francisco's (City's) Gateway Specific Plan planning area with a research and development (R&D) facility and office building. The project site is in an area referred to as the Gateway Campus (consisting of eight buildings at 601, 611, and 651 Gateway Boulevard; 681 to 685 Gateway Boulevard; 701 Gateway Boulevard; 801 Gateway Boulevard; and 901 to 951 Gateway Boulevard). The project site is bounded by a commercial and office building (901 Gateway Boulevard) and a surface parking lot to the north, Gateway Boulevard to the east, a surface parking lot to the south, and commercial and office buildings to the west. The 7.4-acre project site (Assessor's Parcel Numbers 015-024-290 and 015-024-360) currently consists of an existing six-story, approximately 170,235-square-foot office building at 701 Gateway Boulevard and a surface parking lot with approximately 558 parking spaces.

The proposed project involves construction of a 148-foot-tall, seven-story building with approximately 208,800 square feet of space (60 percent R&D uses and 40 percent office uses). The new building would be constructed on the existing surface parking lot. The existing office building at 701 Gateway Boulevard would remain. The ground floor of the proposed building would include a "through lobby" with access from the north and south; the lobby would include an amenity space for tenants. An entry plaza and landscaped visitor lot would be constructed north of the proposed building. An entrance and screened service yard would be constructed south of the proposed building. The proposed project would improve pedestrian connections between the nearby Gateway Campus buildings at 701, 901, 951, and 801 Gateway Boulevard by creating a pedestrian hub central to the campus. The proposed project would also include surface parking lots with a total of 418 parking spaces on-site (including approximately 42 parking spaces in a lot north of the proposed building) for use of the tenants on-site and within the Gateway Campus. Construction of the proposed project, if the related entitlements are approved by the City, would begin in 2020 and occur over approximately 18 months, with an anticipated completion date in 2021.

1.2 Purpose of This Draft EIR

This EIR has been prepared by the South San Francisco Planning Division in the City of South San Francisco, the Lead Agency for the proposed project, in compliance with the provisions of CEQA and the CEQA Guidelines (California Public Resources Code Section 21000 et seq., and California Code of Regulations Title 14, Section 15000 et seq., "CEQA Guidelines"). The lead agency is the public agency that has the principal responsibility for carrying out or approving a project.

As stated in CEQA Guidelines Section 15121(a), an EIR is an informational document intended to inform public agency decision-makers and the public of the significant environmental effects of a project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the project. This EIR assesses potentially significant impacts as defined in CEQA Guidelines Section 15382 as substantial, or potentially substantial, adverse changes in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance.

The degree of specificity required in an EIR should "correspond to the degree of specificity involved in the underlying activity which is described in the EIR" (CEQA Guidelines Section 15146). Pursuant to CEQA Guidelines Section 15161, this is a project-level EIR, defined as an EIR that examines the environmental impacts of a specific development project. As stated above, the EIR analyzes a specific project site development plan.

Before any discretionary project approvals may be granted for a proposed project, the official or decision-making body responsible for taking action on that project must take action on the required environmental documents, including (if applicable) certifying that the EIR was completed in compliance with CEQA, that the decision-making body reviewed and considered the information in the final EIR, and that the EIR reflects the City's independent judgment and analysis. EIR adequacy is defined in CEQA Guidelines Section 15151, which states "[a]n EIR should be prepared with a sufficient degree of analysis to provide decision-makers with information which enables them to make a decision which intelligently takes account of environmental consequences."

CEQA requires that public agencies approve projects only after all feasible means available have been employed to substantially lessen the significant environmental effects of such projects. City decision-makers will use the certified EIR, along with other information and public processes, to determine whether to approve, modify, or disapprove the proposed project, and to require any feasible mitigation measures as conditions of project approval.

1.3 Environmental Review Process

The environmental review process for the proposed project includes a number of steps: publication and circulation of a Notice of Preparation (NOP) for public comment, publication of a draft EIR for public review and comment, preparation and publication of responses to public and agency comments on the draft EIR, and certification of the final EIR. These steps are described below.

1.3.1 Notice of Preparation

The City of South San Francisco Planning Division of the Economic and Community Development Department (Planning Division), issued an NOP of an EIR for the proposed 751 Gateway Project on January 21, 2020, in compliance with Title 14, Sections 15082(a), 15103, and 15375 of the California Code of Regulations (CCR). The NOP review period commenced on January 21, 2020, and concluded on February 20, 2020, and a scoping meeting was held on January 30, 2020. Two commenters spoke at the meeting. The Planning Division received three comment letters from interested parties during the public review and comment period and one letter from the State Clearinghouse providing the NOP to responsible agencies. The Planning Division has considered the comments made by the public in preparation of the draft EIR for the proposed project. The NOP comments letters are provided in Appendix A of this draft EIR.

Comments on the NOP raised the following issues:

Aesthetics

- Confirmation that landscaping on a Caltrans-owned parcel near the project site will be maintained.

Cultural and Tribal Cultural Resources

- Compliance with Assembly Bill 52.

Noise

- Noise impacts on sensitive receptors and associated mitigation measures.
- Consistency with Airport Land Use Compatibility Plan noise policies.

Land Use

- Consistency with the Airport Land Use Compatibility Plan policies concerning noise, safety, height restrictions/airspace protection, and overflight notification, as well as project consistency with land use criteria within the end safety zones described in the Plan.

Hydrology and Water Quality

- Project-related discharge rates and proposed drainage features to address location within the Colma Creek Flood Control Zone.

Project Description

- Confirmation of the project construction schedule.
- Confirmation of the proposed building foundation type.

Transportation

- Traffic impacts to the project site and surrounding area because many existing employees commute via vehicle to the area already.
- Pedestrian circulation through the project site and surrounding area.
- Site access and ensuring that access to the northern driveway on the project site is maintained.
- Confirmation that the parking garage behind the 801 Gateway Boulevard building would remain as is.
- Proposed onsite bus or shuttle services.

1.3.2 Draft Environmental Impact Report

This draft EIR has been prepared on behalf of the City of South San Francisco, the Lead Agency, in accordance with CEQA. It provides an analysis of the physical environmental impacts of construction and operation of the proposed project, and the project's contribution to the environmental impacts from foreseeable cumulative development in the project site vicinity and the City as a whole. It considers all environmental topic areas in Appendix G of the CEQA Guidelines and takes into consideration NOP comments.

Hard copies of the draft EIR, all documents referenced in this draft EIR, and the distribution list for the draft EIR are available at the Planning Counter, South San Francisco Planning Division, 315 Maple Avenue, South San Francisco, CA 94080. Due to the COVID-19 Pandemic, the Planning Division is not open to members of the public. If you would like to review a physical copy of the draft EIR, please call the Planning Division at (650) 877-8535 to make arrangements to review the document. The draft EIR is also available for viewing or downloading at http://www.ssf.net/ceqadocuments under 751 Gateway Boulevard.

How to Comment on the Draft Environmental Impact Report

The City, on September 22, 2020, filed a Notice of Completion (NOC) with the State Clearinghouse, indicating that this draft EIR has been completed and is available for review and comment. This draft EIR will be available for review by the public and interested parties, agencies, and organizations for a review period of at least 45 days, as required by California law. Reviewers should focus on the document's adequacy in identifying and analyzing the proposed project's significant effects on the environment and ways in which the significant effects of the proposed project might be avoided or mitigated (California Code of Regulations Section 15204(a)).

The 45-day review period for the draft EIR is from September 22, 2020, to November 8, 2020. Comments should be submitted in writing during this review period to:

Adena Friedman, Senior Planner
Department of Economic and Community Development
City of South San Francisco
315 Maple Avenue
South San Francisco, California 94080
Comments may also be sent via email to: adena.friedman@ssf.net

For comments sent via email, please include "EIR Comments: 751 Gateway Project" in the subject line and the name and physical address of the commenter in the body of the email. All comments on environmental issues received during the public comment period will be considered and addressed in the Final EIR.

There will be a public hearing before the Planning Commission during the 45-day public review and comment period for this draft EIR to solicit oral comments on the adequacy and accuracy of information presented in this draft EIR. The public hearing on this draft EIR has been scheduled before the Planning Commission for October 15, 2020, via teleconference beginning at 7:00 p.m. or later.

Join Zoom Meeting:
https://us02web.zoom.us/j/88231380027?pwd=Z3NGeVdTMFB0Uk5hTWFKWmtodFhhQT09

Meeting ID: 882 3138 0027

Password: 365780

One tap mobile:

+16699006833,,88231380027#,,,,0#,,365780# US (San Jose)

+13462487799,,88231380027#,,,,0#,,365780# US (Houston)

Dial by your location:

+1 669 900 6833 US (San Jose)

+1 346 248 7799 US (Houston)

+1 253 215 8782 US (Tacoma)

+1 301 715 8592 US (Germantown)

+1 312 626 6799 US (Chicago)

+1 929 205 6099 US (New York)

833 548 0282 US Toll-free

877 853 5257 US Toll-free

888 475 4499 US Toll-free

833 548 0276 US Toll-free

1.3.3 Final Environmental Impact Report

Following the close of the draft EIR public review and comment period, the City will prepare responses to comments, which will contain a summary of comments submitted during the public hearing and a copy of all written comments received on this draft EIR as well as the City's responses to significant environmental points raised in the review and consultation process and any necessary changes to the text. Responses to comments will be prepared and published in a final EIR. The final EIR will be available to all commenting agencies at least 10 days prior to the certification hearing, in accordance with CEQA requirements. The South San Francisco Planning Commission, as the decision-making body for this project, will review the final EIR documents and will determine whether or not the final EIR provides a full and adequate appraisal of the project and its alternatives.

The Planning Commission will review the final EIR for adequacy and certify that the EIR has been completed in compliance with CEQA and that it reflects the City's independent judgment pursuant to the requirements of CEQA Guidelines Section 15090. The City will consider certification of the final EIR and then consider the project separately for approval or denial. Findings on the feasibility of avoiding or reducing the project's significant environmental effects will be made and, if necessary, a Statement of Overriding Considerations will be prepared, balancing the benefits achieved by the proposed project against unavoidable environmental impacts, should the City choose to approve the project with remaining significant impacts that cannot be avoided.

A Notice of Determination (NOD) will be prepared and filed with the State Clearinghouse if the City approves the proposed project. The NOD will include a description of the project, the date of approval, and an indication of whether Findings and Statements of Overriding Considerations were prepared. The NOD will also provide the address where the EIR and record of project approval are available for review.

1.4 Report Organization

This draft EIR is organized into the following chapters.

- Chapter 1, *Introduction*, summarizes the purpose and organization of the draft EIR and the environmental review process.
- Chapter 2, *Executive Summary*, summarizes the proposed project and environmental consequences that would result from the implementation of the project (including significant and unavoidable impacts that cannot be mitigated to a level of less than significant, impacts reduced to a level of less than significant through mitigation, and impacts determined not to be significant), the alternatives to the proposed project that were analyzed, and a summary table of project impacts and mitigation measures.
- Chapter 3, *Project Description*, describes the existing setting, the project sponsor's objectives, the proposed project, and required approvals and actions including the agencies involved in the actions.
- Chapter 4, *Environmental Setting, Impacts, and Mitigation*, begins with Section 4.1, *Approach to Environmental Analysis*, which presents the methodology for environmental analysis, including a list of baseline projects and cumulative projects. Sections 4.2 through 4.9 are each devoted to a particular environmental topic. Each section describes the environmental setting and regulatory framework, provides an analysis of the potential environmental impacts of the project and cumulative impacts, and identifies mitigation measures (if necessary) to reduce significant impacts. The following topics are analyzed:
  - Air Quality (Section 4.2)
  - Biological Resources (Section 4.3)
  - Cultural Resources and Tribal Cultural Resources (Section 4.4)
  - Energy (Section 4.5)
  - Geology and Soils (Section 4.6)
  - Greenhouse Gas Emissions (Section 4.7)
  - Noise and Vibration (Section 4.8)
  - Transportation and Circulation (Section 4.9)

  Section 4.10, *Less-than-Significant Impacts*, summarizes the environmental effects found not to be significant. The following topics are analyzed:
  - Aesthetics
  - Agricultural and Forest Resources
  - Hazards and Hazardous Materials
  - Hydrology and Water Quality
  - Land Use
  - Mineral Resources
  - Population and Housing

   - Public Services
   - Recreation
   - Utilities
   - Wildfire
- Chapter 5, *Alternatives*, summarizes three alternatives to the proposed project as well as the comparative environmental consequences and benefits of each alternative. The No Project Alternative and two additional alternatives are analyzed (the Reduced Surface Parking Lot Demolition Alternative and the Reduced Building Footprint Alternative). This chapter also identifies the environmentally superior alternative and discusses any alternatives that were considered for analysis in the EIR but rejected, then gives the reasons for their rejection.
- Chapter 6, *Other CEQA Considerations*, contains the discussion of mandatory findings of significance (including cumulative impacts), growth-inducing impacts, significant impacts that cannot be avoided, significant irreversible environmental changes, and areas of known controversy and project-related issues that have not been resolved.
- Chapter 7, *Report Preparers*, identifies the Lead Agency, organizations, and individuals consulted during preparation of this draft EIR. In addition, the project sponsor team and the consultants working on the EIR are identified.

Appendices to this draft EIR are as follows:

- Appendix A Notice of Preparation and Comments
- Appendix B Air Quality and Greenhouse Gas Materials
- Appendix C Assembly Bill 52 Consultation Materials
- Appendix D Transportation Impact Analysis

Chapter 2
Executive Summary

This Draft Environmental Impact Report (EIR) has been prepared in accordance with the provision of the California Environmental Quality Act (CEQA) to evaluate the potential impacts of the proposed 751 Gateway Boulevard Project (proposed project) in the City of South San Francisco, San Mateo County, California (City). As required by Section 15123 of the CEQA Guidelines, this summary chapter is intended to highlight major areas of importance in the environmental analysis. Following the summary description of the proposed project, a summary table presents the environmental impacts of the proposed project, and mitigation measures identified to reduce significant impacts. Following the summary table is a description of the alternatives to the proposed project that are addressed in this EIR, including a description of the environmentally superior alternative. The final subsection in this chapter is a summary of environmental issues to be resolved and areas of known controversy.

2.1 Summary Description

This draft EIR analyzes the potential for environmental impacts resulting from implementation of the proposed 751 Gateway Boulevard Project. The proposed project would involve the redevelopment of an approximately 7.4-acre, irregularly shaped site within the City of South San Francisco's Gateway Specific Plan planning area with a research and development (R&D) facility and office building. The project site is in an area referred to as the Gateway Campus (consisting of eight buildings at 601, 611, and 651 Gateway Boulevard; 681 to 685 Gateway Boulevard; 701 Gateway Boulevard; 801 Gateway Boulevard; and 901 to 951 Gateway Boulevard). The project site is bounded by a commercial and office building (901 Gateway Boulevard) and a surface parking lot to the north, Gateway Boulevard to the east, a surface parking lot to the south, and commercial and office buildings to the west. The 7.4-acre project site consists of two parcels (Assessor's Parcel Numbers [APNs] 015-024-290 and 015-024-360). The project site is currently occupied by an existing 6-story, approximately 176,235-square foot (sf) office building at 701 Gateway Boulevard and a surface parking lot containing approximately 558 parking spaces. The project sponsor is 701 Gateway Center LLC. The Lead Agency is the City of South San Francisco. The proposed project would require entitlements to enable development of the project site, including, but not limited to, design review, precise plan approval, Transportation Demand Management (TDM) Plan approval, and a Conditional Use Permit required for a parking reduction.

The proposed project would maintain the existing zoning designation of Zone IV under the Gateway Specific Plan District. The existing zoning allows for development at a maximum floor area ratio (FAR) of 1.25, or a maximum of 402,930 sf, within the project site. The building at 701 Gateway Boulevard is approximately 170,235 sf. Based on the zoning, 232,695 sf of unrealized FAR remains available for the project site, and the proposed project would utilize a portion of that unrealized FAR. The total proposed FAR for the site, including both the existing building at 701 Gateway Boulevard and the proposed building at 751 Gateway Boulevard, would be 1.18.

The proposed building would be constructed on the site of an existing surface parking lot. The proposed project involves the construction of a 148-foot-tall, seven-story building with approximately 208,800 sf of usable space (60 percent R&D uses, and 40 percent office uses). The existing building at 701 Gateway Boulevard would remain. The ground floor of the proposed building would include amenity space and a "through lobby" with access from the north and south. In addition, an entry plaza and landscaped visitor lot would be constructed north of the proposed building. An entrance and screened service yard would be constructed south of the proposed building. Furthermore, the proposed project would also improve pedestrian connections between the nearby Gateway Campus buildings at 701, 901, 951, and 801 Gateway Boulevard, and would provide a total of 418 surface parking spaces on-site (including 42 parking spaces in a lot north of the proposed building) for use of the tenants on-site and within the Gateway Campus. Vehicular access to the project site would be via two existing driveways from Gateway Boulevard. Construction of the proposed project, if the related entitlements are approved by the City, would begin in 2020 over the course of 18 months, with an anticipated completion date in 2021. Construction activities would include the demolition of the existing surface parking lots and removal of trees and vegetation, which would be replaced in accordance with the project's landscape plan and consistent with the City's Tree Preservation Ordinance. Refer to Chapter 3, *Project Description*, for a detailed description of the project's components.

2.2 751 Gateway Boulevard Project Impacts and Mitigation Measures

Table 2-1 provides an overview of the following:

- Environmental impacts with the potential to occur as a result of the proposed project;
- Level of significance of the environmental impacts before implementation of any applicable mitigation measures;
  - NI: No Impact
  - LTS: Less than Significant
  - LTSM: Less than Significant with Mitigation
  - S: Significant
  - SUM: Significant and Unavoidable with Mitigation
- Mitigation measures that would avoid or reduce significant environmental impacts; and
- The level of significance for each impact after the mitigation measures are implemented.

A detailed description of project impacts and mitigation measures are discussed in Chapter 4, *Setting, Impacts, and Mitigation Measures*, of this document.

Table 2-1. Summary of Project Impacts and Mitigation Measures

Potential Environmental Impacts	Level of Significance before Mitigation	Recommended Mitigation Measures	Level of Significance after Mitigation
Aesthetics (refer to Section 4.10, *Less-than-Significant Impacts*)			
Impact AES-1: The proposed project would not have a substantial adverse effect on a scenic vista.	LTS	None required.	LTS
Impact AES-2: The proposed project would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State Scenic Highway.	NI	None required.	NI
Impact AES-3: The proposed project would not conflict with applicable zoning and other regulations governing scenic quality.	LTS	None required.	LTS
Impact AES-4: The proposed project would not create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area.	LTS	None required.	LTS
Impact C-AES-1: The proposed project, in combination with past, present, and reasonably foreseeable future projects, would not result in a significant cumulative impact on aesthetics.	LTS	None required.	LTS
Agriculture and Forest Resources (refer to Section 4.10, *Less-than-Significant Impacts*)			
Impact AG-1: The proposed project would not convert designated Farmland under the Farmland Mapping and Monitoring Program, nor would it conflict with any existing agricultural zoning or a Williamson Act contract, nor would it involve any changes to the environment that would result in the conversion of designated farmland.	NI	None required.	NI

Notes: NI= No Impact; LTS= Less than Significant; LTSM= Less than Significant with Mitigation; S= Significant; SUM= Significant and Unavoidable with Mitigation.

Potential Environmental Impacts	Level of Significance before Mitigation	Recommended Mitigation Measures	Level of Significance after Mitigation
Impact AG-2: The proposed project would not conflict with existing zoning for, or cause rezoning of, forestland, timberland, or timberland zoned Timberland Production, nor would it result in the loss or conversion of forestland to non-forest uses.	NI	None required.	NI
Impact C-AG-1: The proposed project, in combination with past, present, and reasonably foreseeable future projects, would not result in a significant cumulative impact on agricultural or forest resources.	NI	None required.	NI
Air Quality			
Impact AQ-1: The proposed project would not conflict with or obstruct implementation of the applicable air quality plan.	LTS	None required.	LTS
Impact AQ-2: The proposed project would not result in a cumulatively considerable net increase in any criteria pollutant for which the project region is classified as nonattainment under an applicable federal or state ambient air quality standard.	Construction: S Operation: LTS	Construction: **Mitigation Measure AQ-1: Use Clean Diesel-Powered Equipment during Construction to Control Construction-Related NO_X Emissions** The project sponsor shall ensure that all off-road diesel-powered equipment used during construction is equipped with EPA-approved Tier 4 Final engines. The construction contractor shall submit evidence of the use of EPA-approved Tier 4 Final engines or cleaner for project construction to the City prior to the commencement of construction activities. **Mitigation Measure AQ-2: Implement BAAQMD Basic Construction Mitigation Measures** The project sponsor shall require all construction contractors to implement the basic construction mitigation measures recommended by BAAQMD. The emissions reduction measures shall include, at a minimum, the following:	Construction: LTSM Operation: LTS

Notes: NI= No Impact; LTS= Less than Significant; LTSM= Less than Significant with Mitigation; S= Significant; SUM= Significant and Unavoidable with Mitigation.

Potential Environmental Impacts	Level of Significance before Mitigation	Recommended Mitigation Measures	Level of Significance after Mitigation
		• All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, unpaved access roads) shall be watered two times a day. • All haul trucks shall be covered when transporting soil, sand, or other loose material offsite. • All visible mud or dirt track-out material on adjacent public roads shall be removed using wet-power vacuum-type street sweepers at least once a day. The use of dry-power sweeping is prohibited. • All vehicle speeds shall be limited to 15 miles per hour on unpaved roads. • All roadways, driveways, and sidewalks that are to be paved shall be paved as soon as possible. Building pads shall be laid as soon as possible after grading, unless seeding or a soil binder is used. • All construction equipment shall be maintained and properly tuned in accordance with manufacturers' specifications. All equipment shall be checked by a certified visible-emissions evaluator. • Idling times shall be minimized, either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California Airborne Toxics Control Measure). • Publicly visible signs shall be posted with the telephone number and name of the person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations. Operation: None required.	

Notes: NI= No Impact; LTS= Less than Significant; LTSM= Less than Significant with Mitigation; S= Significant; SUM= Significant and Unavoidable with Mitigation.

Potential Environmental Impacts	Level of Significance before Mitigation	Recommended Mitigation Measures	Level of Significance after Mitigation
Impact AQ-3: The proposed project would not expose sensitive receptors to substantial pollutant concentrations.	Construction: S Operation: LTS	Construction: Implement **Mitigation Measures AQ-1 and AQ-2**, above. Operation: None required.	Construction: LTSM Operation: LTS
Impact AQ-4: The proposed project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.	LTS	None required.	LTS
Impact C-AQ-1: The proposed project in combination with past, present, and reasonably foreseeable future projects would not result in a cumulatively considerable impact on air quality plan consistency.	LTS	None required.	LTS
Impact C-AQ-2: The proposed project would not result in a cumulatively considerable contribution to significant cumulative impacts related to a net increase in criteria pollutants for which the region is in nonattainment for an applicable federal or state ambient air quality standard.	S	Implement **Mitigation Measures AQ-1 and AQ-2**, above.	LTSM
Impact C-AQ-3: The proposed project in combination with past, present, and reasonably foreseeable future projects would not contribute to cumulative health risks for sensitive receptors.	S	Implement **Mitigation Measures AQ-1 and AQ-2**, above.	LTSM
Impact C-AQ-4: The proposed project in combination with past, present, and reasonably foreseeable future projects would not contribute to emissions (such as those leading to odors) adversely affecting a substantial number of people.	LTS	None required.	LTS

Notes: NI= No Impact; LTS= Less than Significant; LTSM= Less than Significant with Mitigation; S= Significant; SUM= Significant and Unavoidable with Mitigation.

Potential Environmental Impacts	Level of Significance before Mitigation	Recommended Mitigation Measures	Level of Significance after Mitigation
Biological Resources			
Impact BIO-1: The proposed project would not 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.	S	**Mitigation Measure BI-1: Preconstuction Nesting Bird Surveys and Buffer Areas** The project sponsor shall protect nesting birds and their nests during construction by implementation of the following measures: a. To the extent feasible, conduct initial activities, including, but not limited to, vegetation removal, tree trimming or removal, ground disturbance, building or parking lot demolition, site grading, and other construction activities which may compromise breeding birds or the success of their nests outside the nesting season (February 15–September 15). b. If construction occurs during the bird nesting season, a qualified wildlife biologist* shall conduct a nesting bird preconstruction survey within 14 days prior to the start of construction or demolition at areas that have not been previously disturbed by project activities or after any construction breaks of 14 days or more. The survey shall be performed within 100 feet of the applicable construction phase area in order to locate any active nests of passerine species and within 300 feet of the applicable construction phase area to locate any active raptor (birds of prey) nests, and this survey shall be of those areas that constitute suitable habitat for these species. c. If active nests are located during the preconstruction nesting bird survey, a qualified biologist shall determine if the schedule of construction activities could affect the active nests; if so, the following measures would apply: 1. If the qualified biologist determines that construction is not likely to affect an active nest, construction may proceed without restriction;	LTSM

Notes: NI= No Impact; LTS= Less than Significant; LTSM= Less than Significant with Mitigation; S= Significant; SUM= Significant and Unavoidable with Mitigation.

Potential Environmental Impacts	Level of Significance before Mitigation	Recommended Mitigation Measures	Level of Significance after Mitigation
		however, a qualified biologist shall regularly monitor the nest at a frequency determined appropriate for the surrounding construction activity to confirm there is no adverse effect. Spot-check monitoring frequency would be determined on a nest-by-nest basis, considering the particular construction activity, duration, proximity to the nest, and physical barriers that may screen activity from the nest. 2. If it is determined that construction may cause abandonment of an active nest, the qualified biologist shall establish a no-disturbance buffer around the nest(s), and all project work shall halt within the buffer to avoid disturbance or destruction until a qualified biologist determines that the nest is no longer active. Typically, buffer distances are 100 feet for passerines and 300 feet for raptors; however the buffers may be shortened if an obstruction, such as a building, is within line-of-sight between the nest and construction. 3. Modifying nest buffer distances, allowing certain construction activities within the buffer, and/or modifying construction methods in proximity to active nests shall be approved by the qualified biologist and in coordination with the Planning Division. To the extent necessary to remove or relocate an active nest, such removal or relocation shall be coordinated with the Planning Division, and the removal or relocation shall be in compliance with the California Fish and Game Code and other applicable laws. 4. Any work that must occur within established no-disturbance buffers around active nests shall be monitored by a qualified biologist. If adverse	

Notes: NI= No Impact; LTS= Less than Significant; LTSM= Less than Significant with Mitigation; S= Significant; SUM= Significant and Unavoidable with Mitigation.

Potential Environmental Impacts	Level of Significance before Mitigation	Recommended Mitigation Measures	Level of Significance after Mitigation
		effects in response to project work within the buffer are observed and could compromise the nest, work within the no-disturbance buffer(s) shall halt until the nest occupants have fledged. 5. Any birds that begin nesting within the project area and survey buffers amid construction activities are assumed to be habituated to construction-related or similar noise and disturbance levels. Work may proceed around these active nests subject to Measure c.2 above. * The experience requirements for a "qualified biologist" shall include a minimum of 4 years of academic training and professional experience in biological sciences and related resource management activities, and a minimum of 2 years of experience conducting surveys for each species that may be present within the project area.	
Impact BIO-2: The proposed project would not 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.	NI	None required.	NI
Impact BIO-3: The proposed project would not have a substantial adverse effect on state or federally protected wetlands, including, but not limited to, marsh, vernal pools, coastal areas, etc., through direct removal, filling, hydrological interruption, or other means.	NI	None required.	NI
Impact BIO-4: The proposed project 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.	S	Implement **Mitigation Measure BI-1**, above. **Mitigation Measure BI-2: Lighting Measures to Reduce Impacts on Birds** During design, the project sponsor shall ensure that a qualified biologist experienced with bird strikes and building/lighting design issues shall identify lighting-	LTSM

Notes: NI= No Impact; LTS= Less than Significant; LTSM= Less than Significant with Mitigation; S= Significant; SUM= Significant and Unavoidable with Mitigation.

Potential Environmental Impacts	Level of Significance before Mitigation	Recommended Mitigation Measures	Level of Significance after Mitigation
		related measures to minimize the effects of the building's lighting on birds. The project sponsor shall incorporate such measures, which may include the following and/or other measures, into the building's design and operation. a. Use strobe or flashing lights in place of continuously burning lights for obstruction lighting. Use flashing white lights rather than continuous light, red light, or rotating beams. b. Install shields onto light sources not necessary for air traffic to direct light towards the ground. c. Extinguish all exterior lighting (i.e., rooftop floods, perimeter spots) not required for public safety. d. When interior or exterior lights must be left on at night, the operator of the buildings shall examine and adopt alternatives to bright, all-night, floor-wide lighting, which may include installing motion-sensitive lighting, using desk lamps and task lighting, reprogramming timers, or using lower-intensity lighting. e. Windows or window treatments that reduce transmission of light out of the building shall be implemented to the extent feasible. **Mitigation Measure BI-3: Building Design Measures to Minimize Bird Strike Risk** During design, the project sponsor shall ensure that a qualified biologist experienced with bird strikes and building/lighting design issues shall identify measures related to the external appearance of the building to minimize the risk of bird strikes. The project sponsor shall incorporate such measures, which may include the following and/or other measures, into the building's design. a. Minimize the extent of glazing. b. Use low-reflective glass and/or patterned or fritted glass.	

Notes: NI= No Impact; LTS= Less than Significant; LTSM= Less than Significant with Mitigation; S= Significant; SUM= Significant and Unavoidable with Mitigation.

Potential Environmental Impacts	Level of Significance before Mitigation	Recommended Mitigation Measures	Level of Significance after Mitigation
		c. Use window films, mullions, blinds, or other internal or external features to "break up" reflective surfaces rather than having large, uninterrupted areas of surfaces that reflect, and thus to a bird may not appear noticeably different from, vegetation or the sky.	
Impact BIO-5: The proposed project would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	LTS	None required.	LTS
Impact BIO-6: The proposed project would not conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.	NI	None required.	NI
Impact C-BIO-1: The proposed project would not result in a cumulatively considerable contribution to significant cumulative impacts on biological resources.	S	Implement **Mitigation Measures BI-1, BI-2**, **and BI-3**, above.	LTSM
Cultural Resources			
Impact CR-1: The proposed project would not cause a substantial adverse change in the significance of a historical resource, pursuant to Section 15064.5.	NI	None required.	NI
Impact CR-2: The proposed project would not cause a substantial adverse change in the significance of an archaeological resource, pursuant to Section 15064.5.	S	**Mitigation Measure CR-1: Cultural Resources Worker Environmental Awareness Program (WEAP)** The project applicant shall ensure that a qualified archaeologist shall conduct a WEAP training for all construction personnel on the project site prior to construction and ground-disturbing activities. The training shall include basic information about the types of artifacts that might be encountered during construction activities, and procedures to follow in the event of a discovery. This training shall be provided for any additional personnel added to the project even after the initiation of construction and ground-disturbing activities.	LTSM

Notes: NI= No Impact; LTS= Less than Significant; LTSM= Less than Significant with Mitigation; S= Significant; SUM= Significant and Unavoidable with Mitigation.

Potential Environmental Impacts	Level of Significance before Mitigation	Recommended Mitigation Measures	Level of Significance after Mitigation
		Mitigation Measure CR-2: Halt Construction Activity, Evaluate Find, and Implement Mitigation for Archaeological, Historical, and Tribal Resources In the event that previously unidentified archaeological, historical, or tribal resources are uncovered during site preparation, excavation, or other construction activity, the project applicant shall cease or ensure the ceasing of all such activity within 25 feet of the discovery until the resources have been evaluated by a qualified professional, and specific measures can be implemented to protect these resources in accordance with sections 21083.2 and 21084.1 of the California Public Resources Code. If the find is significant, the project applicant shall ensure that a qualified archaeologist excavate the find in compliance with state law, keeping project delays to a minimum. If the qualified archaeologist determines the find is not significant then proper recordation and identification will ensue and the project shall continue without delay.	
Impact CR-3: The proposed project would not disturb any human remains, including those interred outside of formal cemeteries.	S	**Mitigation Measure CR-3: Halt Construction Activity, Evaluate Remains, and Take Appropriate Action in Coordination with Native American Heritage Commission** In the event that human remains are uncovered during site preparation, excavation, or other construction activity, the project applicant shall cease or ensure the ceasing of all such activity within 25 feet of the discovery until the remains have been evaluated by the County Coroner, and appropriate action taken in coordination with the NAHC, in accordance with section 7050.5 of the CHSC or, if the remains are Native American, section 5097.98 of the California Public Resources Code.	LTSM

Notes: NI= No Impact; LTS= Less than Significant; LTSM= Less than Significant with Mitigation; S= Significant; SUM= Significant and Unavoidable with Mitigation.

Potential Environmental Impacts	Level of Significance before Mitigation	Recommended Mitigation Measures	Level of Significance after Mitigation
Impact CR-4: The proposed project would not cause a substantial adverse change in the significance of a tribal cultural resource, as defined in Public Resource Code Section 21074.	S	Implement **Mitigation Measures CR-1 and CR-2**, above.	LTSM
Impact C-CR-1: The proposed project would not result in a cumulatively considerable contribution to significant cumulative impacts on archeological resources, human remains, and tribal cultural resources.	S	Implement **Mitigation Measures CR-1, CR-2**, **and CR-3**, above.	LTSM
Energy			
Impact EN-1: The proposed project would not result in a potentially significant environmental impact due to the wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation.	Construction: S Operation: LTS	Construction: **Implement Mitigation Measure GHG-1,** below. Operation: None required.	Construction: LTSM Operation: LTS
Impact EN-2: The proposed project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency.	LTS	None required.	LTS
Impact C-EN-1: The proposed project in combination with past, present, and reasonably foreseeable projects would not result in the wasteful, inefficient, or unnecessary consumption of energy resources during construction or operation.	LTS	None required.	LTS
Impact C-EN-2: The proposed project in combination with past, present, and reasonably foreseeable projects would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency.	LTS	None required.	LTS

Notes: NI= No Impact; LTS= Less than Significant; LTSM= Less than Significant with Mitigation; S= Significant; SUM= Significant and Unavoidable with Mitigation.

Potential Environmental Impacts	Level of Significance before Mitigation	Recommended Mitigation Measures	Level of Significance after Mitigation
Geology and Soils			
Impact GEO-1: The proposed project would not directly or indirectly cause potential substantial adverse effects, including risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic ground shaking, seismically related ground failure, including liquefaction, or landslides.	LTS	None required.	LTS
Impact GEO-2: The proposed project would not result in substantial soil erosion or the loss of topsoil.	LTS	None required.	LTS
Impact GEO-3: The proposed project would not be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project.	LTS	None required.	LTS
Impact GEO-4: The proposed project would not 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.	LTS	None required.	LTS
Impact GEO-5: The proposed project would not have soils that would be incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.	NI	None required.	NI
Impact GEO-6: The proposed project could directly or indirectly destroy a unique paleontological resource on site or unique geologic feature.	S	**Mitigation Measure GEO-1: Halt Construction Activity, Evaluate Find, and Implement Mitigation for Paleontological Resources** In the event that previously unidentified paleontological resources are uncovered during site preparation, excavation, or other construction activity, the project sponsor shall cease or ensure that all such activity within 25 feet of the discovery cease until the resources have	LTSM

Notes: NI= No Impact; LTS= Less than Significant; LTSM= Less than Significant with Mitigation; S= Significant; SUM= Significant and Unavoidable with Mitigation.

Potential Environmental Impacts	Level of Significance before Mitigation	Recommended Mitigation Measures	Level of Significance after Mitigation
		been evaluated by a qualified professional, and specific measures can be implemented to protect these resources in accordance with sections 21083.2 and 21084.1 of the California Public Resources Code. If the find is significant, a qualified paleontologist shall excavate the find in compliance with state law, keeping project delays to a minimum. If the qualified paleontologist determines the find is not significant then proper recordation and identification shall ensue and the project will continue without delay.	
Impact C-GEO-1: The project, in combination with past, present, and reasonably foreseeable future projects, would not result in a significant cumulative impact on geology and soils.	LTS	None required.	LTS
Impact C-GEO-2: The proposed project would not result in a cumulatively considerable contribution to significant cumulative impacts on paleontological resources.	S	Implement **Mitigation Measure GEO-1,** above.	LTSM
Greenhouse Gas Emissions			
Impact GHG-1a: The proposed project would not generate GHG emissions, either directly or indirectly, that may have significant impact on the environment during construction.	S	**Mitigation Measure GHG-1: Require Implementation of BAAQMD-recommended Construction BMPs** The project sponsor shall require its contractors, as a condition in contracts (e.g., standard specifications), to reduce construction-related GHG emissions by implementing BAAQMD's recommended BMPs as set forth in BAAQMD's 2017 CEQA Guidelines, including (but not limited to) the following measures.[1] • Ensure alternative-fuel (e.g. biodiesel, electric) construction vehicles/equipment make up at least 15 percent of the fleet;	LTSM

[1] Ibid.

Notes: NI= No Impact; LTS= Less than Significant; LTSM= Less than Significant with Mitigation; S= Significant; SUM= Significant and Unavoidable with Mitigation.

Potential Environmental Impacts	Level of Significance before Mitigation	Recommended Mitigation Measures	Level of Significance after Mitigation
		• Use local building materials (at least 10 percent) sourced from within 100 miles of the planning area; and • Recycle and reuse at least 50 percent of construction waste or demolition materials. The project sponsor shall submit evidence of compliance to the city prior to the start of construction.	
Impact GHG-1b: The proposed project would generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment during operation.	S	Implement **Mitigation Measure TR-1,** below. **Mitigation Measure GHG-2: Operational GHG Reduction Measures** The project sponsor shall: • Plant 44 additional trees on existing surface parking lots; and • Install 28 more electric vehicle (EV) charging spots than required by the 2019 Building Code.	SUM
Impact GHG-2: The proposed project would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.	S	Implement **Mitigation Measure TR-1,** below.	SUM
Hazards and Hazardous Materials (refer to Section 4.10, *Less-than-Significant Impacts*)			
Impact HAZ-1: The proposed project would not create a significant hazard for the public or the environment through the routine transport, use, or disposal of hazardous materials.	LTS	None required.	LTS
Impact HAZ-2: The proposed project would not create a significant hazard for the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.	LTS	None required.	LTS
Impact HAZ-3: The proposed project would not emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school.	LTS	None required.	LTS

Notes: NI= No Impact; LTS= Less than Significant; LTSM= Less than Significant with Mitigation; S= Significant; SUM= Significant and Unavoidable with Mitigation.

Potential Environmental Impacts	Level of Significance before Mitigation	Recommended Mitigation Measures	Level of Significance after Mitigation
Impact HAZ-4: The proposed project would not be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, create a significant hazard for the public or the environment.	LTS	None required.	LTS
Impact HAZ-5: The proposed project would not result in a safety hazard or excessive noise for people residing or working in the project area.	LTS	None required.	LTS
Impact HAZ-6: The proposed project would not impair implementation of, or physical interfere with, an adopted emergency response plan or emergency evacuation plan.	LTS	None required.	LTS
Impact HAZ-7: The proposed project would not expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires.	NI	None required.	NI
Impact C-HAZ-1: The proposed project, in combination with past, present, and reasonably foreseeable future projects, would not result in a significant cumulative impact on hazards and hazardous materials.	LTS	None required	LTS
Hydrology and Water Quality (refer to Section 4.10, *Less-than-Significant Impacts*)			
Impact HY-1: The proposed project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface water or groundwater quality.	LTS	None required.	LTS
Impact HY-2: The proposed project would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project would impede sustainable groundwater management of the basin.	LTS	None required.	LTS

Notes: NI= No Impact; LTS= Less than Significant; LTSM= Less than Significant with Mitigation; S= Significant; SUM= Significant and Unavoidable with Mitigation.

Potential Environmental Impacts	Level of Significance before Mitigation	Recommended Mitigation Measures	Level of Significance after Mitigation
Impact HY-3: The proposed project would not substantially alter the existing drainage pattern of the site or area in a manner that would result in substantial erosion or siltation onsite or offsite; substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite; 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 floodflows.	LTS	None required.	LTS
Impact HY-4: In flood hazard, tsunami, or seiche zones, the proposed project would not risk release of pollutants due to project inundation.	LTS	None required.	LTS
Impact HY-5: The proposed project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.	LTS	None required.	LTS
Impact C-HY-1: The proposed project, in combination with past, present, and reasonably foreseeable future projects, would not result in a significant cumulative impact on hydrology and water quality.	LTS	None required.	LTS
Land Use (refer to Section 4.10, *Less-than-Significant Impacts*)			
Impact LU-1: The proposed project would not physically divide an established community.	LTS	None required.	LTS
Impact LU-2: The proposed project would not result in 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.	LTS	None required.	LTS

Notes: NI= No Impact; LTS= Less than Significant; LTSM= Less than Significant with Mitigation; S= Significant; SUM= Significant and Unavoidable with Mitigation.

Potential Environmental Impacts	Level of Significance before Mitigation	Recommended Mitigation Measures	Level of Significance after Mitigation
Impact C-LU-1: The proposed project, in combination with past, present, and reasonably foreseeable future projects, would not result in a significant cumulative impact on land use.	LTS	None required.	LTS
Mineral Resources (refer to Section 4.10, *Less-than-Significant Impacts*)			
Impact MIN-1: The proposed project would not 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 and/or a locally important mineral resource recovery site delineated in a local general plan, specific plan, or other land use plan.	NI	None required.	NI
Noise and Vibration			
Impact NOI-1: The proposed project would not generate 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.	S	**Mitigation Measure NOI-1: Construction Noise Control Plan to Reduce Noise Outside of the Standard Construction Hours in the City of South San Francisco.** The project sponsor and/or the contractor(s) for the proposed project shall obtain a permit to complete work outside of the standard construction hours outlined in the City Municipal Code. In addition, the project sponsor and/or the contractor(s) for the proposed project shall develop a construction noise control plan to reduce noise levels to within the City's daytime and nighttime noise standards. Specifically, the plan shall demonstrate that noise from construction activities that occur daily between 7:00 and 8:00 a.m. weekdays and Saturday will comply with the applicable City noise limit of 65 dBA at the nearest existing land use, and construction activities that occur between 10:00 p.m. and 7:00 a.m. will comply with the applicable City noise limit of 60 dBA at the nearest existing land use. Measures to help reduce noise from construction activity during non-standard construction hours to these levels shall be incorporated into this plan and may include, but are not limited to, the following.	LTSM

Notes: NI= No Impact; LTS= Less than Significant; LTSM= Less than Significant with Mitigation; S= Significant; SUM= Significant and Unavoidable with Mitigation.

Potential Environmental Impacts	Level of Significance before Mitigation	Recommended Mitigation Measures	Level of Significance after Mitigation
		• Require all construction equipment be equipped with mufflers and sound control devices (e.g., intake silencers and noise shrouds) that are in good condition (at least as effective as those originally provided by the manufacturer) and appropriate for the equipment. • Maintain all construction equipment to minimize noise emissions. • Locate construction equipment as far as feasible from adjacent or nearby noise-sensitive receptors. • Require all stationary equipment be located to maintain the greatest possible distance to the nearby existing buildings, where feasible. • Require stationary noise sources associated with construction (e.g., generators and compressors) in proximity to noise-sensitive land uses to be muffled and/or enclosed within temporary enclosures and shielded by barriers, which can reduce construction noise by as much as 5 dB. • Use noise-reducing enclosures around noise-generating equipment during nighttime/non-standard daytime hours. Prohibit the use of impact tools (e.g., jack hammers) during these hours. • Prohibit idling of inactive construction equipment for prolonged periods during nighttime hours (i.e., more than 2 minutes). • Advance notification shall be provided to surrounding land uses disclosing the construction schedule, including the various types of activities that would be occurring throughout the duration of the construction period. • The construction contractor shall provide the name and telephone number an on-site construction liaison. If construction noise is found	

Notes: NI= No Impact; LTS= Less than Significant; LTSM= Less than Significant with Mitigation; S= Significant; SUM= Significant and Unavoidable with Mitigation.

Potential Environmental Impacts	Level of Significance before Mitigation	Recommended Mitigation Measures	Level of Significance after Mitigation
		to be intrusive to the community (complaints are received), the construction liaison shall investigate the source of the noise and require that reasonable measures be implemented to correct the problem. • Use electric motors rather than gasoline- or diesel-powered engines to avoid noise associated with compressed air exhaust from pneumatically powered tools during nighttime hours. Where the use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust could be used; this muffler can lower noise levels from the exhaust by about 10 dB. External jackets on the tools themselves could be used, which could achieve a reduction of 5 dB. **Mitigation Measure NOI-2: Operational Noise Study to Determine Attenuation Measures to Reduce Noise from Project Mechanical Equipment** Once equipment models and design features to attenuate noise have been selected, the project sponsor shall conduct a noise analysis to estimate actual noise levels of project-specific mechanical equipment, including heating and cooling equipment (such as boilers, chillers, cooling towers, and exhaust fans), to reduce potential noise impacts resulting from project mechanical equipment. Feasible methods to reduce noise below the significant threshold include, but are not limited to, selecting quieter equipment, siting equipment further from the roofline, and/or enclosing all equipment in a mechanical equipment room designed to reduce noise. This analysis shall be conducted, and its results and reduction methods provided to the City, prior to the issuance of building permits. The analysis shall be prepared by persons qualified in acoustical analysis and/or engineering and shall demonstrate with reasonable certainty that the mechanical equipment selected for the project and the attenuation	

Notes: NI= No Impact; LTS= Less than Significant; LTSM= Less than Significant with Mitigation; S= Significant; SUM= Significant and Unavoidable with Mitigation.

Potential Environmental Impacts	Level of Significance before Mitigation	Recommended Mitigation Measures	Level of Significance after Mitigation
		features incorporated into project design would ensure noise from these equipment do not result in noise at the nearest existing land use of 65 dBA L_{eq} during the daytime and 60 dBA L_{eq} during the nighttime. The project sponsor shall incorporate all recommendations from the acoustical analysis necessary to ensure that noise sources would meet applicable requirements of the noise ordinance into the building design and operations.	
Impact NOI-2: The proposed project would not generate excessive ground-borne vibration or ground-borne noise levels.	LTS	None required.	LTS
Impact NOI-3: The proposed project would not expose people residing or working in the project area to excessive noise levels for a project located within the vicinity of a private airstrip or an airport land use plan or, where such plan has not been adopted, within two miles of a public airport or public use airport.	NI	None required.	NI
Impact C-NOI-1: The proposed project would not result in a cumulatively considerable contribution to the generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project site in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies.	S	Implement **Mitigation Measure NOI-2,** above.	LTSM
Impact C-NOI-2: The proposed project, in combination with past, present, and reasonably foreseeable future projects, would not expose persons to or generate excessive ground-borne vibration or ground-borne noise levels.	LTS	None required.	LTS

Notes: NI= No Impact; LTS= Less than Significant; LTSM= Less than Significant with Mitigation; S= Significant; SUM= Significant and Unavoidable with Mitigation.

Potential Environmental Impacts	Level of Significance before Mitigation	Recommended Mitigation Measures	Level of Significance after Mitigation
Population and Housing (refer to Section 4.10, *Less-than-Significant Impacts*)			
Impact PH-1: The proposed project would not induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes or businesses) or indirectly (for example, through extension of roads or other infrastructure).	LTS	None required.	LTS
Impact PH-2: The proposed project would not displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere.	NI	None required.	NI
Impact C-PH-1: The proposed project would not result in a cumulatively considerable contribution to a significant impact on population and housing.	LTS	None required.	LTS
Public Services (refer to Section 4.10, *Less-than-Significant Impacts*)			
Impact PS-1: The proposed project would not require the provision of new or physically altered fire and emergency medical services in order to maintain acceptable service ratios, response times, or other performance objectives.	LTS	None required.	LTS
Impact PS-2: The proposed project would not require the provision of new or physically altered police protection services in order to maintain acceptable service ratios, response times, or other performance objectives.	LTS	None required.	LTS
Impact PS-3: The proposed project would not require the provision of new or physically altered schools or other public facilities in order to maintain acceptable service ratios or other performance objectives.	LTS	None required.	LTS

Notes: NI= No Impact; LTS= Less than Significant; LTSM= Less than Significant with Mitigation; S= Significant; SUM= Significant and Unavoidable with Mitigation.

Potential Environmental Impacts	Level of Significance before Mitigation	Recommended Mitigation Measures	Level of Significance after Mitigation
Impact C-PS-1: The proposed project, in combination with past, present, and reasonably foreseeable future projects, would not result in a significant cumulative impact on public services.	LTS	None required.	LTS
Recreation (refer to Section 4.10, *Less-than-Significant Impacts*)			
Impact REC-1: The proposed project would not require the provision of new or physically altered park facilities in order to maintain acceptable service ratios or other performance objectives.	LTS	None required.	LTS
Impact REC-2: The proposed project would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated.	LTS	None required.	LTS
Impact REC-3: The proposed project would not include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.	LTS	None required.	LTS
Impact C-REC-1: The proposed project, in combination with past, present, and reasonably foreseeable future projects, would not result in a significant cumulative impact on recreation.	NI	None required.	NI
Transportation and Circulation			
Impact TR-1: Existing home-based work (HBW) vehicle miles traveled (VMT) per employee in the travel demand model transportation analysis zone (TAZ) that encompasses the project result in greater than 16.8 percent below the regional average HBW VMT per employee under Existing Plus Project and Cumulative Plus Project conditions.	S	**Mitigation Measure TR-1: First- and Last-mile Strategies** The project sponsor shall fund the design and construction of the following off-site improvements to support the project's first- and last-mile strategies necessary to support auto trip reduction measures. • The project shall provide a fair-share contribution towards the City's cost of facilities and improvements identified below for the purposes of upgrading Poletti	SUM

Notes: NI= No Impact; LTS= Less than Significant; LTSM= Less than Significant with Mitigation; S= Significant; SUM= Significant and Unavoidable with Mitigation.

Potential Environmental Impacts	Level of Significance before Mitigation	Recommended Mitigation Measures	Level of Significance after Mitigation
		Way sidewalk to a Class I shared-use bicycle and pedestrian pathway between the Caltrain Station at East Grand Avenue, and the street's northern terminus as identified in the *Active South City: Bicycle and Pedestrian Master Plan* (currently in draft form), or if said Master Plan is in the process of being amended or updated at the time of the first building permit for the project, then the project shall instead provide a fair-share contribution in an equivalent amount towards improvements and upgrades of equivalent design and purpose, as determined by the City's Chief Planner in his reasonable discretion. The Gateway Property Owners Association is currently in the process of dedicating the Poletti Way right-of-way to the City and the dedication is expected to be completed by the end of 2020. The improvement will include curb ramps, curb and gutter, signage, markings, and other changes necessary to meet Caltrans and City of South San Francisco Class I bikeway standards. Specific improvements will include upgrades at vehicular crossings (such as driveways and minor streets) to provide 10-foot minimum wide barrier-free accessible ramps that permit direct, two-way bicycle and pedestrian travel. Adequate warning and regulatory signage and markings will be provided to alert road users of potential conflicts per the *California Manual on Uniform Traffic Control Devices* (CAMUTCD). Existing pavement conditions will be assessed and reconstructed if necessary, per City of South San Francisco standards. The project's obligation to pay a fair share contribution toward this improvement is contingent upon the City (i) adopting a final *Active South City Bicycle and Pedestrian Master Plan* that includes the improvement, or City approval of a plan for improvements of equivalent design and purpose;	

Notes: NI= No Impact; LTS= Less than Significant; LTSM= Less than Significant with Mitigation; S= Significant; SUM= Significant and Unavoidable with Mitigation.

Potential Environmental Impacts	Level of Significance before Mitigation	Recommended Mitigation Measures	Level of Significance after Mitigation
		(ii) acquiring any necessary right of way; and (iii) implementing a program that will require fair share contributions from other developments in the East of 101 area that will benefit from the improvement. • The project shall provide a fair share contribution toward the City's cost of facilities and improvements identified below for the purposes of extending Class II bicycle lanes on Gateway Boulevard between East Grand Avenue and Oyster Point Boulevard, assuming 1,100 linear feet of frontage. This improvement will include striping new bicycle lanes and restriping existing lanes. Extending bicycle lanes will support enhanced bicycle access from south of the project site as identified in the *Active South City: Bicycle and Pedestrian Master Plan* (currently in draft form). If said Master Plan is in the process of being amended or updated at the time of the first building permit for the project, then the project shall instead provide a fair-share contribution in an equivalent amount towards improvements and upgrades of equivalent design and purpose, as determined by the City's Chief Planner in his reasonable discretion. • The project shall participate in first-/last-mile shuttle program(s) to Caltrain, BART, and the ferry terminal. Shuttles may be operated by Commute.org and/or a future East of 101 transportation management agency. The project may provide an on-site loading zone for potential future private shuttles or pick-up/drop-off operations; however public shuttle shall utilize on-street shuttle stops located adjacent to the project site in order to minimize additional travel time for shuttles. Southbound shuttles on Gateway Boulevard shall use the existing shuttle stop at the intersection of Gateway Boulevard and the Gateway Business Park driveway (approximately 500 feet south of the project site) or the project may choose to construct a new southbound	

Notes: NI= No Impact; LTS= Less than Significant; LTSM= Less than Significant with Mitigation; S= Significant; SUM= Significant and Unavoidable with Mitigation.

Potential Environmental Impacts	Level of Significance before Mitigation	Recommended Mitigation Measures	Level of Significance after Mitigation
		shuttle stop along the project frontage on Gateway Boulevard. A new shuttle stop shall accommodate small shuttles and larger buses and shall be designed in close coordination with the City and the shuttle operators taking into consideration planned roadway improvements, other new developments, and rider needs. Northbound shuttles on Gateway Boulevard shall use the future shuttle stop at the Gateway Business Park driveway (directly across the street from the project site) as proposed as part of the Gateway of Pacific project. • The project shall provide a more direct connection to on-street shuttle stops by adding directional curb ramps and high visibility crosswalks at the northern leg of the Gateway Boulevard/Gateway Business Park driveway/Project driveway intersection. Since no crosswalk currently existing across the northern leg of this intersection, the project shall review existing intersection signal timing and adjust if necessary, to accommodate the new pedestrian phase. Add high-visibility crosswalks on the south side of the Oyster Point Boulevard / Gateway Boulevard intersection (southern and eastern legs of the intersection) to improve access to shuttle stops on Oyster Point Boulevard.	
Impact TR-2: The proposed project would not cause vehicle queues approaching a given movement downstream of Caltrans freeway facilities to exceed existing storage space for that movement or add vehicle trips to existing freeway off-ramp vehicle queues that exceed storage capacity resulting in a potentially hazardous condition.	LTS	None required.	LTS

Notes: NI= No Impact; LTS= Less than Significant; LTSM= Less than Significant with Mitigation; S= Significant; SUM= Significant and Unavoidable with Mitigation.

Potential Environmental Impacts	Level of Significance before Mitigation	Recommended Mitigation Measures	Level of Significance after Mitigation
Impact TR-3: The proposed project would not produce a detrimental impact to existing bicycle or pedestrian facilities, or conflict with adopted plans and programs.	LTS	None required.	LTS
Impact TR-4: The proposed project would not produce a detrimental impact to local transit or shuttle service, or conflict with adopted plans and programs.	S	Implement **Mitigation Measure TR-1,** above.	LTSM
Impact TR-5: The proposed project would not substantially increase hazards due to a geometric design feature or incompatible uses.	LTS	None required.	LTS
Impact TR-6: The proposed project would not result in inadequate emergency access.	LTS	None required.	LTS
Utilities (refer to Section 4.10, *Less-than-Significant Impacts*)			
Impact UT-1: The proposed project would not require or result in the relocation or construction of new or expanded water, wastewater treatment, stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects.	LTS	None required.	LTS
Impact UT-2: The proposed project would have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years.	LTS	None required.	LTS
Impact UT-3: The proposed project would result in a determination by the wastewater treatment provider that 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.	LTS	None required.	LTS

Notes: NI= No Impact; LTS= Less than Significant; LTSM= Less than Significant with Mitigation; S= Significant; SUM= Significant and Unavoidable with Mitigation.

Potential Environmental Impacts	Level of Significance before Mitigation	Recommended Mitigation Measures	Level of Significance after Mitigation
Impact UT-4: The proposed project would not 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. In addition, the proposed project would comply with federal, state, and local management and reduction statutes and regulations related to solid waste.	LTS	None required.	LTS
Impact C-UT-1: The proposed project, in combination with past, present, and reasonably foreseeable future projects, would not result in a significant cumulative impact on utilities and service systems.	LTS	None required.	LTS
Wildfire (refer to Section 4.10, *Less-than-Significant Impacts*)			
Impact WF-1: The proposed project would not substantially impair an adopted emergency response plan or emergency evacuation plan.	LTS	None required.	LTS
Impact WF-2: The proposed project would not, because of slope, prevailing winds, or other factors, exacerbate wildfire risks and thereby expose project occupants to pollutant concentrations form a wildfire or the uncontrolled spread of a wildfire.	LTS	None required.	LTS
Impact WF-3: The proposed project would not require the installation or maintenance of associate infrastructure, such as roads, fuel breaks, emergency water sources, power lines, or other utilities, that may exacerbate the fire risk or that may result in temporary or ongoing impacts on the environment.	NI	None required.	NI

Notes: NI= No Impact; LTS= Less than Significant; LTSM= Less than Significant with Mitigation; S= Significant; SUM= Significant and Unavoidable with Mitigation.

Potential Environmental Impacts	Level of Significance before Mitigation	Recommended Mitigation Measures	Level of Significance after Mitigation
Impact WF-4: The proposed project would not 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.	NI	None required.	NI
Impact C-WF-1: The proposed project, in combination with past, present, and reasonably foreseeable future projects, would not result in a significant cumulative impact on a statewide or locally adopted emergency response plan or emergency evacuation plan.	LTS	None required.	LTS
Source: ICF, 2020.			

Notes: NI= No Impact; LTS= Less than Significant; LTSM= Less than Significant with Mitigation; S= Significant; SUM= Significant and Unavoidable with Mitigation.

2.2.1 Alternatives

CEQA Guidelines Section 15126.6 requires an EIR to evaluate the No Project Alternative and a reasonable range of alternatives to the project that would feasibly attain most of the project's basic objectives, but that would also avoid or substantially reduce any identified significant environmental impacts of the project. The proposed project would result in significant and unavoidable impacts to greenhouse gas emissions (related to vehicle miles traveled [VMT]) and transportation and circulation (related to VMT). In addition, the proposed project would result in impacts to air quality, biological resources, cultural resources and tribal cultural resources, energy, geology and soils, and noise that would be less than significant with mitigation. There are no project alternatives that would feasibly attain most of the proposed project's basic objectives but would avoid or substantially lessen any identified significant adverse environmental impacts of the proposed project. Accordingly, the range of project alternatives presents options that would avoid or reduce a less-than-significant impact with mitigation.

As described in Chapter 5, *Alternatives*, three alternatives are evaluated in this EIR:

- Alternative A—No Project Alternative
- Alternative B—Reduced Surface Parking Lot Demolition Alternative
- Alternative C—Reduced Building Footprint Alternative

As also described in Chapter 5, the EIR also evaluated, but ultimately rejected six alternatives that were considered by the City but rejected as infeasible during the scoping and environmental review process.

2.2.1.1 Alternative A: No Project Alternative

Under Alternative A—No Project Alternative, the existing land uses and site conditions at the project site would not change. The existing six-story, approximately 170,235-square-foot office building on the project site would remain, as would the existing surface parking, which has approximately 558 parking spaces. There would be no tree removal. Under the Alternative A, the FAR at the project site would remain at 0.53. Alternative A would not preclude potential future development of the project site with a range of land uses that are permitted at the project site.

2.2.1.2 Alternative B: Reduced Surface Parking Lot Demolition Alternative

Alternative B—Reduced Surface Parking Lot Demolition Alternative would demolish a smaller part of the existing surface parking lot at the project site, resulting in the same building as the proposed project but with a reduced area for parking, streetscape, and landscape improvements compared to the proposed project. Alternative B would redevelop approximately half of the proposed parking area in the northeast corner of the project site (shown in Figure 3-4 as a parking lot with 46 parking spaces in a lot north of the proposed building) with new parking, landscaping, trees, pedestrian entryway elements, and streetscape features. Most of the northeastern portion of the project site, which abuts an unnamed street to the north, Gateway Boulevard to the east, and the proposed entry plaza to the west, would remain in its current state as an existing surface parking lot with the exception of possible asphalt resurfacing and new striping for the parking spaces. This alternative would result in approximately 32 more parking spaces than the proposed project, for a total of approximately 450 parking spaces. The 376 existing parking spaces in the rectangular parking lots in the southern portion of the project site would be included in this alternative, as is also proposed for the project.

Alternative B would retain approximately 32 existing trees in the northeastern part of the project site that are proposed for removal under the project, bringing the total number of trees to be removed to 143 compared to 175 under the proposed project. Additionally, existing shrubs and other landscaping in the northeastern part of the project site would remain and would not be renovated. The Gateway Campus site plan would be redesigned for the reduced development area under this alternative and would most likely result in a reimagined Gateway pedestrian connection with a potentially reduced art wall, biotreatment planting, and tree planting plan. It is anticipated that the landscaped square footage and permeable and impermeable surface areas of the project site would remain approximately the same as the proposed project. Site access and circulation would be otherwise similar to that proposed for the project.

The building design under Alternative B would be the same in height, square footage, bulk, architecture, and materials as the proposed project and would similarly be designed to meet LEED Gold certification and International WELL Building Institute WELL and Fitwel standards.

2.2.1.3 Alternative C: Reduced Building Footprint Alternative

Alternative C—Reduced Building Footprint Alternative would involve constructing a building that is the same height as the proposed project with the same ratio of office, R&D, and retail (i.e., café and fitness center) uses, but with a reduced building footprint and approximately 25 percent less square footage, with a total of 156,600 gsf. The site plan would be similar to the proposed project.

Similar to the proposed project, Alternative C would involve demolishing and removing an existing surface parking lot and the construction of a new building on the existing parking lot; however, the finished building would have a smaller footprint. Similar to the project, Alternative C would include surface parking lots with a total of 418 parking spaces on-site (including approximately 42 parking spaces in a lot north of the proposed building) for tenant use both on-site and within the Gateway Campus. Site access and circulation would be similar to that proposed for the project. Alternative C would include the same overall pedestrian and landscape improvements to the site as the proposed project, and would also improve pedestrian connections between the nearby Gateway Campus buildings at 701, 901, 951, and 801 Gateway Boulevard by creating a pedestrian hub central to the campus. Alternative C would result in project site coverage of similar proportions of pervious to impervious surfaces (or increased pervious surfaces compared to the project, as would be expected with a smaller building footprint), three biotreatment areas, and a similar number of overall and new street trees planted on site compared to the project. The design of the building under Alternative C would be similar in architecture and materials as the proposed project and would similarly be designed to meet LEED Gold certification and International WELL and Fitwel standards.

2.2.2 Environmentally Superior Alternative

CEQA Guidelines Section 15126.6(e)(2) requires identification of an environmentally superior alternative (the alternative that has the fewest significant environmental impacts) from among the other alternatives evaluated if the proposed project has significant impacts that cannot be mitigated to a less-than-significant level. If Alternative A, the No Project Alternative, is found to be the environmentally superior alternative, the EIR must identify an environmentally superior alternative among the other alternatives.

Alternative B and Alternative C would result in the same significant and unavoidable impacts with mitigation related to transportation and circulation and GHG emissions because neither alternative would reduce the average HBW VMT per employee. Among the alternatives to the project, Alternative B would offer a lower level of impact by reducing the site-specific impacts that would be less than significant with mitigation. Specifically, Alternative B would require less ground disturbance and fewer tree removals, which would reduce impacts to biological resources, cultural resources and tribal resources, and geology and soils (paleontology) to a greater extent than Alternative C. Therefore, Alternative B is the environmentally superior alternative.

2.2.3 Areas of Known Controversy and Issues to be Resolved

The City of South San Francisco Planning Division of the Economic and Community Development Department (Planning Division), issued a Notice of Preparation (NOP) of an EIR for the proposed 751 Gateway Boulevard Project on January 21, 2020, in compliance with Title 14, Sections 15082(a), 15103, and 15375 of the California Code of Regulations. The NOP review period commenced on January 21, 2020, and concluded on February 20, 2020, and a scoping meeting was held on January 30, 2020. Two commenters spoke at the meeting. The Planning Division received three comment letters from interested parties during the public review and comment period, and one letter from the State Clearinghouse providing the NOP to responsible agencies. The Planning Division has considered the comments made by the public in preparation of the draft EIR for the proposed project. A copy of the NOP and all comments are provided in Appendix A. Based on the comments received during the scoping process, there are no known controversy or issues to be resolved.

Chapter 3
Project Description

3.1 Overview

The project sponsor, 701 Gateway Center LLC, proposes to redevelop a 7.4-acre, irregularly shaped site within the City of South San Francisco's (City's) Gateway Specific Plan planning area with a research and development (R&D) facility and office building. The project site is in an area referred to as the Gateway Campus (consisting of eight buildings at 601, 611, and 651 Gateway Boulevard; 681 to 685 Gateway Boulevard; 701 Gateway Boulevard; 801 Gateway Boulevard; and 901 to 951 Gateway Boulevard). The project site is bounded by a commercial and office building (901 Gateway Boulevard) and a surface parking lot to the north, Gateway Boulevard to the east, a surface parking lot to the south, and commercial and office buildings to the west. The 7.4-acre project site (Assessor's Parcel Numbers 015-024-290 and 015-024-360) currently consists of an existing six-story, approximately 170,235-square-foot office building at 701 Gateway Boulevard and a surface parking lot with approximately 558 parking spaces. The project proposes to construct a new building, referred to as 751 Gateway Boulevard, on the site of an existing surface parking lot in the northern portion of the project site.

The proposed project would maintain the existing zoning designation of Zone IV under the Gateway Specific Plan District (GSPD). The existing zoning allows for development at a maximum floor area ratio (FAR) of 1.25, or a maximum of 402,930 square feet, within the project site. The building at 701 Gateway Boulevard is approximately 170,235 square feet. Based on the zoning, 232,695 square feet of unrealized FAR remains available for the project site, a portion of which the proposed project would utilize. The total proposed FAR for the site, including both the existing building at 701 Gateway Boulevard and the proposed building at 751 Gateway Boulevard, would be 1.18.

The proposed project involves construction of a 148-foot-tall, seven-story building with approximately 208,800 square feet of space (60 percent R&D uses and 40 percent office uses). The new building would be constructed on the existing surface parking lot. The existing office building at 701 Gateway Boulevard would remain. The ground floor of the proposed building would include a "through lobby" with access from the north and south; the lobby would include an amenity space for tenants. An entry plaza and landscaped visitor lot would be constructed north of the proposed building. An entrance and screened service yard would be constructed south of the proposed building. The proposed project would improve pedestrian connections between the nearby Gateway Campus buildings at 701, 901, 951, and 801 Gateway Boulevard by creating a pedestrian hub central to the campus. The proposed project would also include surface parking lots with a total of 418 parking spaces on-site (including approximately 42 parking spaces in a lot north of the proposed building) for use of the tenants on-site and within the

Gateway Campus. Construction of the proposed project, if the related entitlements are approved by the City, would begin in 2020 and occur over approximately 18 months, with an anticipated completion date in 2021.[1]

3.1.1 Project Objectives

The project sponsor identified the following objectives for the project:

- Create state-of-the-art R&D facilities consistent with the *South San Francisco General Plan* (General Plan) designation for the site as well as General Plan goals and policies.
- Develop a building that is aesthetically compatible with the surrounding vicinity, with height, massing and design treatment that is compatible with other recent development in the East of 101 Area.
- Promote the City's ongoing development of the "East of 101 Area" into a nationally recognized biotechnology and R&D center to attract other life science uses.
- Further the City's policies for developing the East of 101 Area with new opportunities for continued evolution from manufacturing and warehousing/distribution to biotechnology and R&D.
- Redevelop underutilized parcels within the project site at a higher density to build on the synergy of R&D development and to take advantage of opportunities offered in the East of 101 Area to create a vibrant, attractive and efficiently-designed R&D campus.
- Develop an R&D campus with a high level of design quality, as called for in the design policies and guidelines of the *East of 101 Area Plan*.
- Build a project that creates quality jobs for the City.
- Provide sufficient space for tenants to employ key scientific and business personnel in proximity to each other to foster efficient collaboration and productivity.
- Capitalize on the project's proximity to the new Caltrain station to provide transit-oriented employment opportunities, encourage employees to commute using public transit, and reduce VMT and air emissions by reducing single-occupancy vehicle trips.
- Enhance the visual quality of development around the existing Gateway Campus by providing a high-quality, modern building and functional and attractive landscape areas. The project will take advantage of and enhance access to the Caltrain station by upgrading the pedestrian and bicycle connections within and to the Gateway campus.

---

1 Subsequent to the preparation of this draft EIR, the project sponsor indicated that construction of the proposed project could begin in 2021 and end in 2022, which is a delay of approximately six months compared with the construction schedule analyzed in Chapter 4, *Environmental Setting, Impacts, and Mitigation*. The anticipated buildout year for the project assumed in the EIR analysis is 2021. Equipment and vehicle emission factors decline as a function of time due to increasingly stringent air emission standards. Therefore, if construction of the project were to extend to 2022, the air quality and greenhouse gas analyses in this draft EIR would likely be conservative, as actual emissions would likely be lower in 2022 than what was assumed for the project analysis. In addition, this potential change to the project schedule would not result in any changes to the environmental analysis for any of the environmental topic sections because the overall duration of construction and construction intensity would remain the same.

- Promote alternatives to automobile transportation to further the City's transportation objectives by emphasizing linkages, transportation demand management (TDM), pedestrian access, and ease of movement between buildings.
- Enhance vehicular, bicycle, and pedestrian circulation and access in the area surrounding the project site.
- Build a project that is viable in the East of 101 Area, based on market conditions and project service requirements for the area.
- Incorporate flexibility for office and R&D uses to ensure that the project is responsive to tenant demands, based on market conditions.
- Maximize positive fiscal impacts for the City through the creation of jobs, enhancement of property values, and generation of property taxes and development fees.

3.1.2 Project Location

The project site is located in the City of South San Francisco. The City is located south of the City of Brisbane and north of the City of San Bruno. The City is built on the bay plain and on the northern foothills of the Coastal Range. The City is located along major transportation routes, including U.S. 101, Interstate 380, Interstate 280, and the Union Pacific Railroad. Figure 3-1, shows the location of the project site and the regional vicinity.

The project site is within the City's Gateway Specific Plan area, within the East of 101 area. The Gateway Specific Plan area consists of approximately 23 acres of land and is bounded by Oyster Point Boulevard to the north, Eccles Avenue to the east, East Grand Avenue to the south, and the Caltrain right-of-way to the west.

3.2 Existing Setting

The project site is located in the Gateway Campus, an area with primarily commercial and office uses. As shown in Figure 3-2, the project site is bounded by a commercial and office building (901 Gateway Boulevard) and a surface parking lot to the north, Gateway Boulevard to the east, a surface parking lot to the south, and commercial and office buildings to the west.

The project site is served by Gateway Boulevard as the primary arterial road, fed by Oyster Point Boulevard (running east to west) to the north and East Grand Avenue (running east to west) to the south. In addition, the project site is approximately 0.5 mile north of the South San Francisco Caltrain station and approximately 0.2 mile east of U.S. 101. San Francisco International Airport (SFO) is approximately 2 miles south of the project site.

3.2.1 Regional Setting

The City of South San Francisco encompasses approximately 4,298 acres and is largely composed of single-use areas, with industry in the eastern and southeastern portions of the City and single-family homes to the north and west. Much of the City is already urbanized, and the amount of vacant land is limited. Growth in the City typically occurs mostly in the form of redevelopment and intensification.

Figure 3-1
Project Location
751 Gateway Boulevard Project

Graphics ... 00662.19 (1-16-20) AB

Figure 3-2
Existing Project Site
751 Gateway Boulevard Project

3.2.2 Surrounding Land Uses

The project site is within an area comprised of numerous business parks near the intersection of Gateway Boulevard and Oyster Point Boulevard, as shown in Figure 3-2. The project site is within the Gateway Campus, which includes eight buildings at 601, 611, and 651 Gateway Boulevard; 681 to 685 Gateway Boulevard, 701 Gateway Boulevard, 801 Gateway Boulevard, and 901 to 951 Gateway Boulevard. The Gateway Campus is composed of three- to 16-story buildings, consisting of approximately 1.4 million square feet of office, R&D, childcare, and amenity uses and approximately 4,330 parking spaces. North of the project site across Oyster Point Boulevard is the Cove at Oyster Point, which is composed of four- to six-story buildings consisting of office and biotechnology uses. South of the project site across an unnamed street that connects Poletti Way to Gateway Boulevard is the Genentech Campus, which is composed of three- to six-story office and R&D buildings. The Genentech Campus also includes a five-story parking garage and amenities such as retail uses and childcare uses.

The Caltrain right-of-way is located along the western boundary of the Gateway Campus. Oyster Point Park is approximately 0.7 mile east of the project site and the Bay Trail is approximately 0.2 mile north of the project site.

3.2.3 Site Setting

The 7.4-acre project site (assessor's parcel numbers 015-024-290 and 015-024-360) consists of a six-story, approximately 170,235-square-foot office building at 701 Gateway Boulevard and surface parking lots with approximately 558 parking spaces. The existing building at 701 Gateway Boulevard was constructed in 1998. Approximately 450 employees work at the existing office building at 701 Gateway Boulevard. Approximately 19 percent of the project site is covered with pervious surfaces, and 81 percent of the project site is covered with impervious surfaces. A summary of the existing characteristics of the project site is provided in Table 3-1.

Table 3-1. Summary of Existing Site Characteristics

Feature	Existing Project Site
Assessor's Parcel Numbers	015-024-290 and 015-024-360
Lot size	7.4 acres (approximately 322,344 square feet)
General Plan land use/zoning	Business Commercial (BC)/Gateway Specific Plan District
Existing uses at 701 Gateway Boulevard	170,235 square feet of office space
Building height	Approximately 97 feet
Number of stories	6
Existing FAR[1]	0.53
Vehicle parking	558 spaces

Source: 701 Gateway Center LLC, 2019

Notes:

1 Floor area ratio (FAR) is the relationship between the total amount of usable floor area that a building has, or has been permitted for the building, and the total area of the lot on which the building stands. A higher FAR number is more likely to indicate a dense or urban construction. The South San Francisco Municipal Code Sections 20.040.008 and 20.40.009, allow certain areas to be excluded from the calculation of square feet of Floor Area and FAR.

3.2.3.1 Existing Land Use and Zoning Designations

The project site is identified in the 1999 General Plan as Business Commercial (BC). The BC land use designation allows for a mix of business and professional offices, visitor service establishments, and retail establishments. More specifically, the General Plan describes the permitted uses for the site as administrative, financial, business, and professional uses; medical and public offices; R&D facilities; and visitor-oriented and regional commercial uses. The land use designation was created to encourage the type of commercial and hotel growth that is currently occurring along South Airport, Gateway, and Oyster Point Boulevards as well as the South Spruce corridor within the City. The base maximum permitted FAR in the BC land use designation is 0.5, but increases may be permitted up to a total FAR of 1.0 for uses such as R&D facilities, or for development meeting specific TDM, off-site improvement, or specific design standards. A FAR of up to 1.25 is permitted in the Gateway Business Park Master Plan area and in certain portions of the Oyster Point Specific Plan area for projects that include a TDM program. In addition, the General Plan provides that the zoning ordinance can provide specific exceptions to FAR limitations for uses with low employment densities, such as research facilities, or low peak-hour traffic generation.

The City of South San Francisco is organized into several geographic areas, referred to as planning areas. The project site is in the Gateway Specific Plan Area, which includes a variety of commercial and R&D land uses, and is zoned GSPD. The GSPD is divided into five zones and the project site is located in Zone IV. The maximum number of buildings allowed within the GSPD is 50, with a maximum height of 250 feet.[2] The maximum surface area covered by structures (lot coverage) is limited to 50 percent, and development is permitted up to a maximum FAR of 1.25, or a maximum of 402,930 square feet, within the project site.

Figure 3-3 illustrates the existing General Plan land use and zoning designations of the project site and surrounding area.

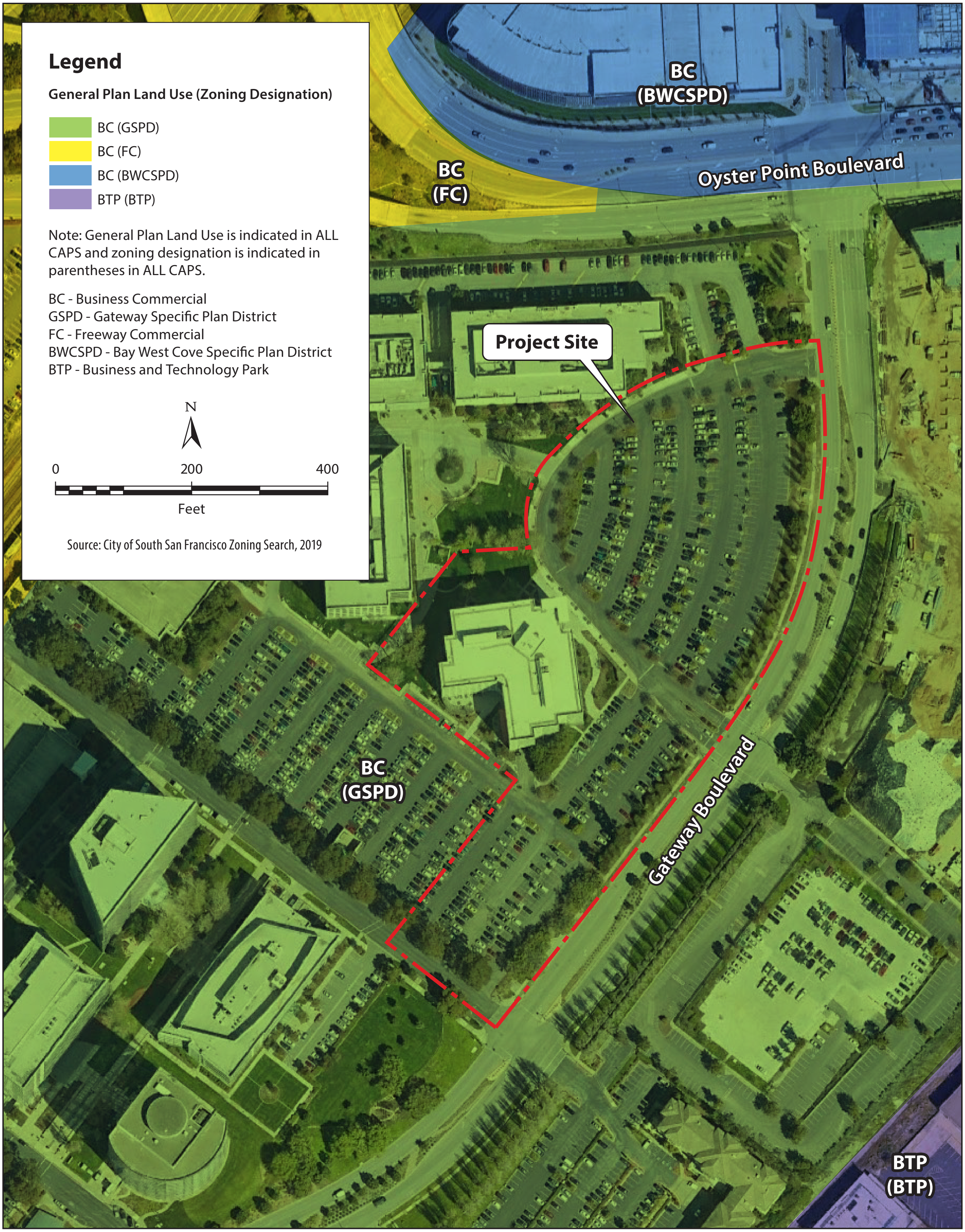
East of 101 Area Plan Designation

The project site is designated as Gateway Specific Plan Area in the *East of 101 Area Plan*.[3] The City interprets the *East of 101 Area Plan* as a design-level document. Per policy IM-5, the *Gateway Specific Plan* is not affected by the land use regulations of the *East of 101 Area Plan*. Development standards and density determinations, including FAR, are established in the General Plan, which was updated after the adoption of, and takes precedence over, the *East of 101 Area Plan*. Moreover, when *East of 101 Area Plan* policies are in conflict with or inconsistent with the General Plan, the General Plan policies supersede requirements outlined in the *East of 101 Area Plan*. Applicable design-level policies of the *East of 101 Area Plan* include all policies of the Design Element; Land Use Element policies LU-8a (Gateway Specific Plan uses), and LU-8b (Gateway Specific Plan FAR). Policy LU-8a provides that the uses allowed in the Gateway Specific Plan Area are those specified in the Gateway Specific Plan. Policy LU-8b provides that the maximum FAR in the Gateway Specific Plan Area is that specified in the Gateway Specific Plan.

---

2 Building heights east of U.S. 101 are allowed the maximum height limits permissible under Federal Aviation Regulations Part 77. General Plan Figure 2-2 establishes a 261-foot height limit for the project site, whereas Exhibit IV-13 of the 2012 SFO Comprehensive Airport Land Use Compatibility Plan establishes a 300-foot height limit for the project site.

3 The land use entitlements of the Gateway Specific Plan are not affected by the *East of 101 Area Plan* and supersede any standards or entitlements set forth in the *East of 101 Area Plan*. However, development within the project site would be required to conform with other policies of the *East of 101 Area Plan*, such as design guidelines.



Graphics...00406.17 (1-16-20) AB

Figure 3-3
Existing General Plan Land Use and Zoning Designations
751 Gateway Boulevard Project

Height Limits

In general, height limitations or restrictions in the East of 101 Area are defined by the SFO sphere of influence.[4] Development on the project site is limited to 300 feet in height by elevation according to the *Comprehensive Airport Land Use Compatibility Plan for the Environs of San Francisco International Airport* prepared in 2012,[5] but may be restricted based on notification and consultation with the Federal Aviation Administration (FAA) under Part 77.9 of the Code of Federal Regulations (CFR). The Gateway Specific Plan and GSPD establish a 250-foot height limit within the GSPD.

3.2.3.2 Existing Parking, Circulation, and Access

The project site contains two driveways on Gateway Boulevard, one driveway from the existing internal access drive immediately south of the building at 951 Gateway Boulevard, and one driveway on an unnamed street that connects Poletti Way to Gateway Boulevard, as shown in Figure 3-2. Vehicles access the building at 701 Gateway Boulevard via the two driveways on Gateway Boulevard and travel to either the 376-space semi-circular parking lot in the northern portion of the project site, the rectangular parking lots in the southern portion of the project site that include a total of 170 spaces, or the 18 spaces immediately west of the building at 701 Gateway Boulevard. In total, there are approximately 558 surface parking spaces on the site. On-street parking is not permitted on the streets surrounding the project site. In addition, there is a loading dock on the southeast side of the existing building at 701 Gateway Boulevard.

The Gateway Campus, excluding 801 Gateway Boulevard and 901- 951 Gateway Boulevard, currently has a total of 3,457 parking spaces, which provides a parking ratio of 3.19 spaces per 1,000 gross square feet. Of these spaces, in addition to the 558 spaces that serve the project site (office) (3.25 spaces/1,000 gross square feet), there are 369 spaces that serve 681-685 Gateway Boulevard (lab) (2.55 spaces/1,000 gross square feet), 711 spaces that serve 601 Gateway Boulevard (office) (3.29 spaces/1,000 gross square feet), 857 spaces that serve 611 Gateway Boulevard (office) (3.29 spaces/1, 000 gross square feet), and 956 spaces that serve 651 Gateway Boulevard (office) (3.29 spaces/1,000 gross square feet).

The project site is served by a Class II bicycle lane along a segment of Oyster Point Boulevard north of the project site.[6] Pedestrian access is provided by a sidewalk along Gateway Boulevard adjacent to the project site.

4 City of South San Francisco Zoning Ordinance, 2017.20.110.003(A).

5 City/County Association of Governments of San Mateo County. 2012. *Comprehensive Airport Land Use Compatibility Plan for the Environs of San Francisco International Airport*. Exhibit IV-14, p. IV-45.

6 A Class II bicycle lane is a striped bicycle lane separated from traffic.

3.2.3.3 Existing Landscaping and Site Conditions

Landscaping on the project site is limited to trees and ornamental landscaping features such as parking and building buffers. The project site contains approximately 227 trees, including 35 protected trees.[7,8] The project site, which is approximately 34 to 21 feet above mean sea level, slopes gently from west to east, toward Gateway Boulevard.[9]

3.2.3.4 Existing Utility Infrastructure

Potable Water[10]

The project site is served by the California Water Service Company, which purchases most of its water from the San Francisco Public Utilities Commission. There is a 12-inch water main in Gateway Boulevard. There is a 12-inch lateral that serves the 701 Gateway Boulevard building and a 4-inch service line that connects to the lateral. In addition, there is an existing 8-inch fire water main that serves the 701 Gateway Boulevard building and connects to the 12-inch lateral and loops around the buildings located at 701, 801, and 901 Gateway Boulevard.

Stormwater[11]

There are several storm drains located around the perimeter of the northern surface parking lot. In addition, there is an 18-inch storm drain line in Gateway Boulevard that flows north and a 30-inch storm drainpipe in Gateway Boulevard that flows south.

Sanitary Sewer System[12]

The project site is served by an existing sanitary sewer system. There is an existing pump station located immediately north of the project site at the intersection of Gateway Boulevard and Oyster Point Boulevard. There is a 10-inch sewer main in Gateway Boulevard that runs from the pump station and connects to an 8-inch lateral that serves the 701 Gateway Boulevard building. The 10-inch sewer main also has a 12-inch gravity pipe outfall that continues south in Gateway Boulevard.

Natural Gas and Electric

The project site is served by the existing natural gas and electric service provided by Pacific Gas and Electric (PG&E). There are underground electrical lines in the eastern portion of the northern surface parking lot. There is a 4-inch natural gas main in Gateway Boulevard.

---

7 Arborwell. 2020. *701 Gateway Boulevard Tree Inventory & Assessment, 701 Gateway Boulevard, South San Francisco, California*. February 12.

8 The City of South San Francisco defines a protected tree as any tree of the following species with a circumference of 75 inches or more when measured 54 inches above natural grade: blue gum (*Eucalyptus globulus*), black acacia (*Acacia melanoxylon*), myoporum (*Myoporum laetum*), sweetgum (*Liquidambar styraciflua*), glossy privet (*Lingustrum lucidum*), lombardy poplar (*Populus nigra*).

9 Langan. 2019. *Geotechnical Investigation, 751 Gateway Boulevard, South San Francisco, California*. November 7.

10 BKF Engineers. 2020. *701 and 751 Gateway Boulevard, South San Francisco Wet Utilities*. March 5, 2020.

11 Ibid.

12 Ibid.

Telecommunications

There are numerous telecommunication providers in the City for DSL, wireless, cable, and fiber optics. Various communication companies (e.g., AT&T, Comcast, CenturyLink/Level3 and Zayo) provide service via underground conduits located in the vicinity of the project site.

Refuse and Recycling

The project site is served by South San Francisco Scavenger Company and Blue Line Transfer, Inc., which are located approximately 1 mile southeast of the project site. The building at 701 Gateway Boulevard has one off-street loading dock for trash and recycling pickup services.

3.3 Description of the Proposed Project

As discussed in detail below, the proposed project would include construction of a building, consisting of R&D and office uses and amenity uses supportive to the proposed uses on the project site and existing uses in the Gateway Campus. The proposed project would also include surface parking, streetscape improvements, and infrastructure for utilities.

3.3.1 Proposed Project Buildout

The proposed project would maintain the existing zoning designation of Zone IV under the GSPD. Based on the zoning, 232,695 square feet of unrealized FAR is associated with the project site. The proposed project would use a portion of the unrealized FAR associated with the project site; the proposed total FAR for the site, including both the existing building at 701 Gateway Boulevard and the proposed building at 751 Gateway Boulevard, would be 1.18.

3.3.2 Proposed Project Site Plan

The proposed project involves construction of a 148-foot-tall, seven-story building with approximately 208,800 square feet of space (60 percent R&D uses and 40 percent office uses). The new building would be constructed on the existing surface parking lot. The existing office building at 701 Gateway Boulevard would remain. The proposed building would be constructed on the site of an existing surface parking lot in the northern portion of the project site. The proposed project would also include two surface parking lots with a total of 418 parking spaces. Upon project completion, approximately 26 percent of the project site would be covered with pervious surfaces, and 74 percent of the project site would be covered with impervious surfaces. A summary of the proposed project features is provided in Table 3-2. Figure 3-4 illustrates the proposed project site plan.

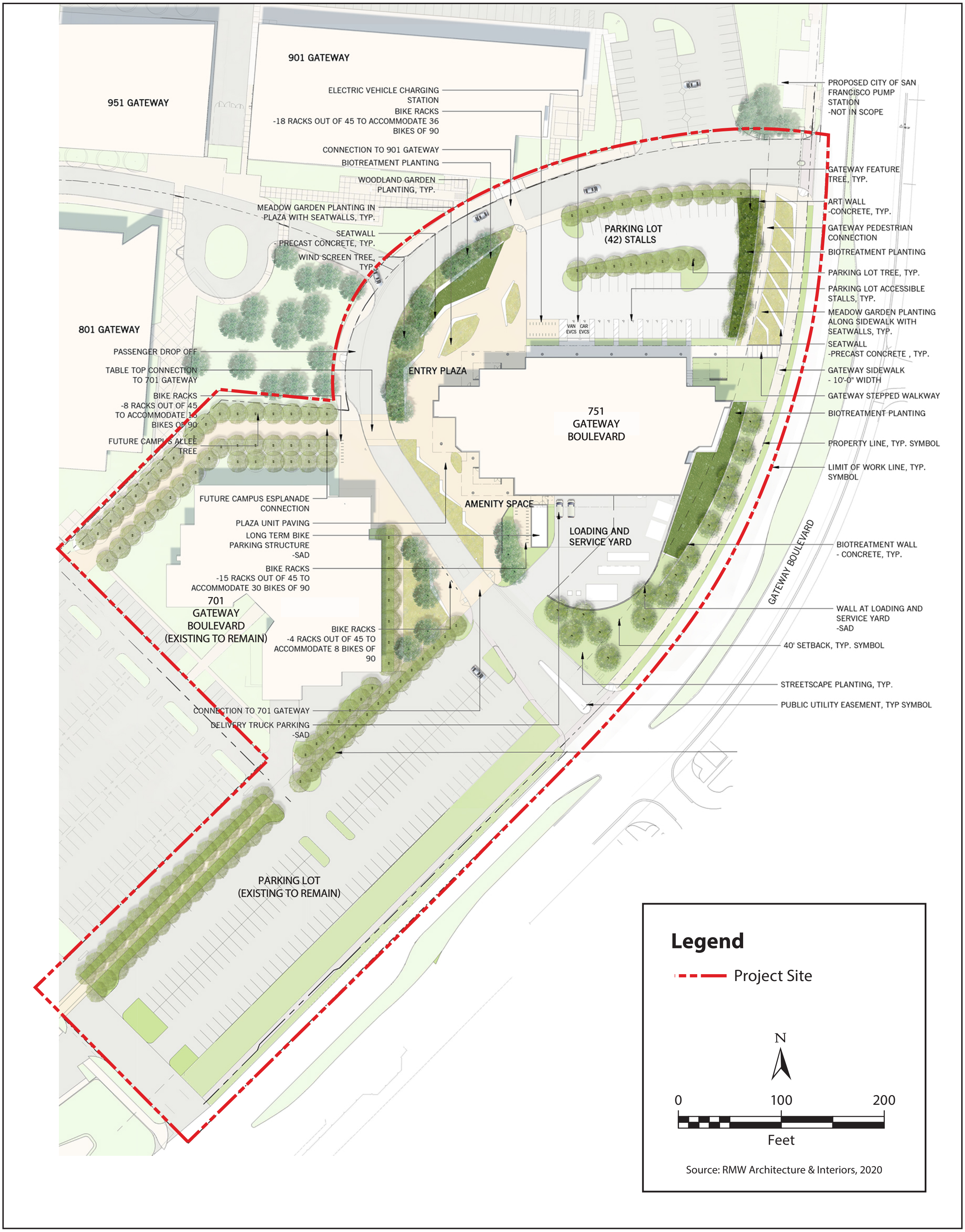
Table 3-2. Proposed Project Features

Feature	Proposed Project
Existing uses at 701 Gateway Boulevard (to remain)	170,235 square feet of office space
Total proposed new uses at 751 Gateway Boulevard	208,800 square feet
R&D	*118,000 square feet*
Office	*78,700 square feet*
Amenity (including café and fitness center)	*12,100 square feet*
Building height	148 feet
Number of stories	7
Site FAR[1]	1.18
Vehicle parking	418 spaces (including nine accessible spaces, 25 electric vehicle charging spaces, and 60 carpool spaces)
Short-term bicycle parking spaces	90 spaces
Long-term bicycle parking spaces	36 spaces
Trees	164 trees (accounting for the 175 existing trees to be removed, 52 existing trees to remain, and additional 112 trees to be planted)

Source: 701 Gateway Center LLC, 2019.

Notes:

[1] Floor area ratio (FAR) is the relationship between the total amount of usable floor area that a building has, or has been permitted for the building, and the total area of the lot on which the building stands. A higher FAR number is more likely to indicate a dense or urban construction. The South San Francisco Municipal Code Sections 20.040.008 and 20.40.009, allow certain areas to be excluded from the calculation of square feet of Floor Area and FAR.



Graphics...00406.17 (2-21-20) AB

ICF

Figure 3-4
Conceptual Project Site Plan
751 Gateway Boulevard Project

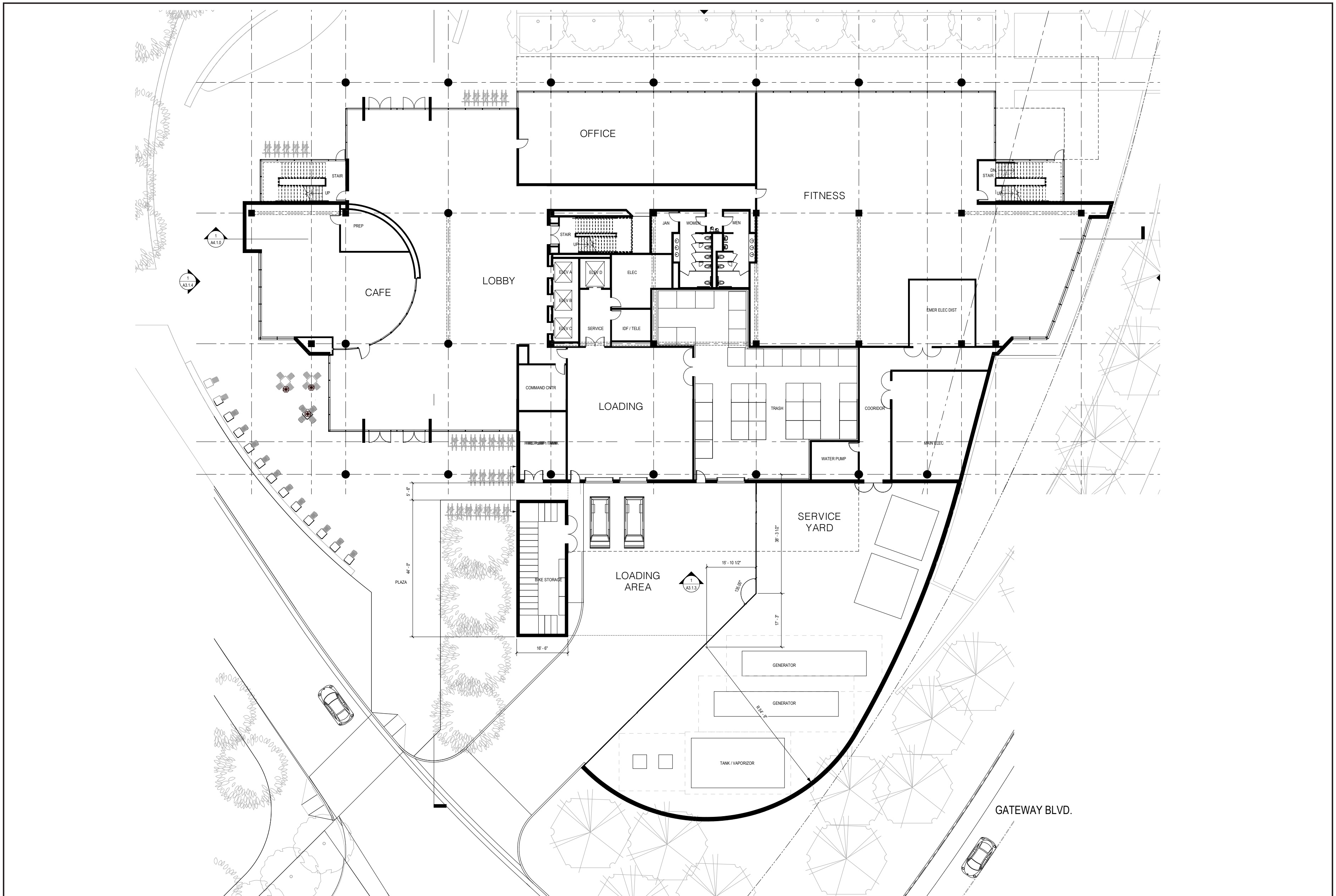
Figure 3-5 and Figure 3-6 show the interior configuration for the proposed building. The ground floor (floor 1) of the proposed building would include a "through lobby" with access from the north and south in the western portion of the building. The lobby would include an amenity space, including a café, which would be open to the public. In addition, floor 1 would include a fitness center, which would only be open to occupants of the Gateway Campus. Floor 2 would include additional lobby space. Floors 3 through 7 would be used for R&D and office space. Figure 3-7 and Figure 3-8 show the elevations for the proposed building.

A service and loading yard would be constructed south of the proposed building (Figure 3-5). The yard would be screened by a 15-foot aluminum wall along Gateway Boulevard that would be similar to the architecture of the proposed building; the screen along the southern and western portion of the yard would be constructed of a perforated aluminum panel. The yard would contain an emergency generator and loading docks. The proposed project would include one diesel 1,250-kilowatt (kW) generator (1,562-kilovolt amps) equipped with a level 3 enclosure. The generator would be required to meet the Bay Area Air Quality Management District's (BAAQMD's) permitting requirements for stationary sources. Periodic testing of the generator would be completed; testing is anticipated to consist of one test per week for 30 to 45 minutes per test at a load of 100 percent for up to 50 hours per year maximum, as limited by the BAAQMD. Other than testing, the generator would only operate during emergencies. The proposed project would include an aboveground tank to store diesel fuel for the proposed generator. The proposed project would include two loading docks in the yard, which would accommodate weekly trash and recycling pickups, daily deliveries (e.g., FedEx, postal service), building equipment servicing (e.g., PG&E checking meters), and occupants while moving in/moving out. In addition, all major heating, ventilation, and air conditioning (HVAC) equipment that would serve the proposed building would be located on the roof in a screened enclosure or in the rooftop penthouse for the chiller and boiler. The screened enclosure would comprise aluminum panels as an extension of the building.

3.3.2.1 Project Site Access, Circulation, and Parking

The existing access to the project site (two driveways on Gateway Boulevard, one driveway from the internal access drive south of the building at 951 Gateway Boulevard, and one driveway on an unnamed street that connects Poletti Way to Gateway Boulevard) would be retained under the proposed project (Figure 3-4). In addition, the existing internal access drive within the project site, which would curve around the proposed building and the proposed northern surface parking lot, would be retained under the proposed project. The proposed project would include a new shuttle stop/passenger pickup/drop-off zone for employee shuttles along the western portion of the access drive north of the existing building at 701 Gateway Boulevard. Emergency vehicle access to the project site would be provided by Gateway Boulevard and the proposed parking lot to be constructed north of the proposed building would serve as the main point of entry for emergency vehicles.

The parking for the proposed project would be provided as part of a master parking plan for the portion of the Gateway Campus consisting of 601 Gateway Boulevard, 611 Gateway Boulevard, 651 Gateway Boulevard, 681–685 Gateway Boulevard, 701 Gateway Boulevard, and 751 Gateway Boulevard. The master parking plan would provide 3,099 parking spaces, which would provide a ratio of 2.4 spaces/1,000 gross square feet for this portion of the Gateway Campus. Of these spaces, 1,916 spaces would serve 601, 611, and 651 Gateway Boulevard (office) in a shared parking



Source: RMW Architecture & Interiors, 2020

Graphics ... 00662.19 (2-21-20) AB

Figure 3-5
Conceptual Floor Plan (Floor 1)
751 Gateway Boulevard Project

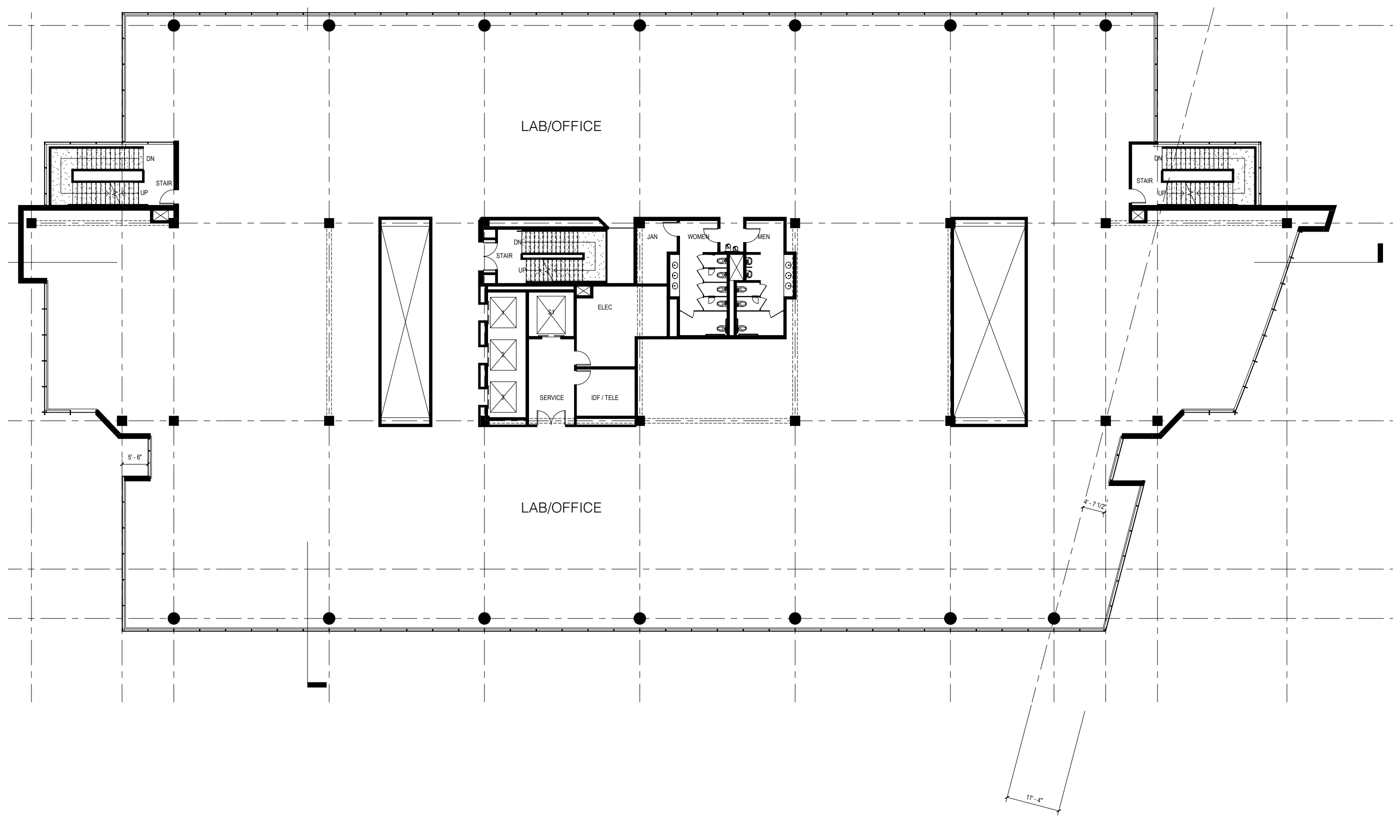
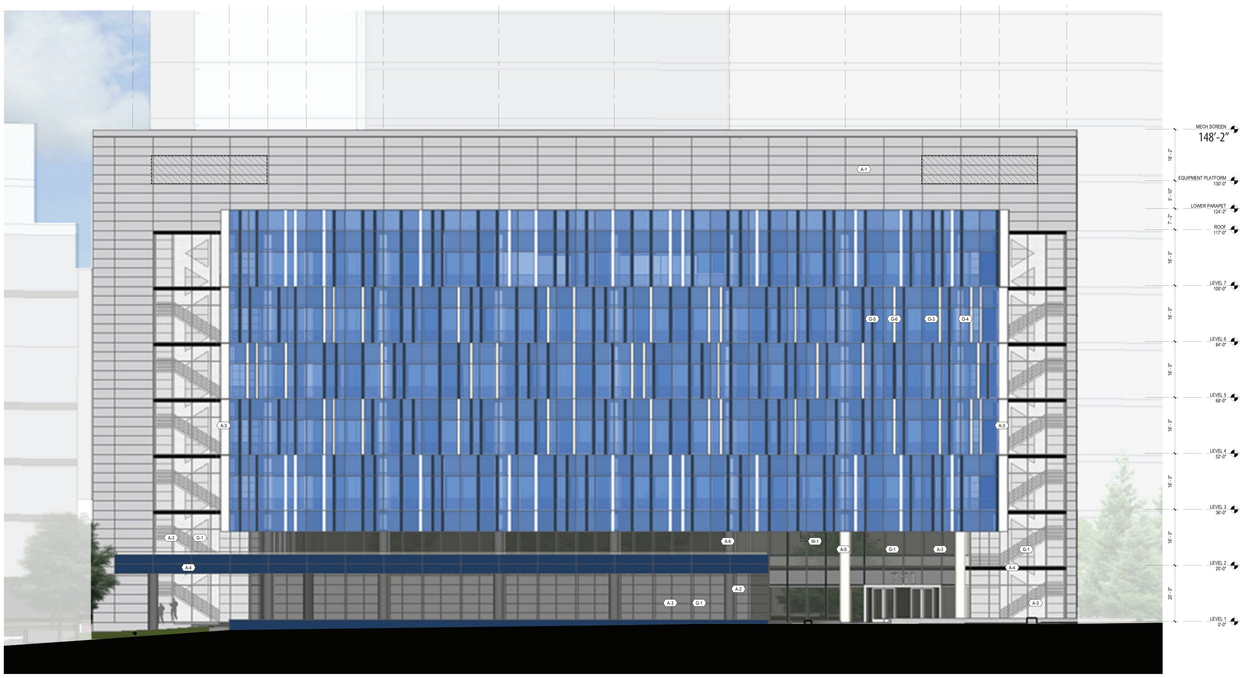
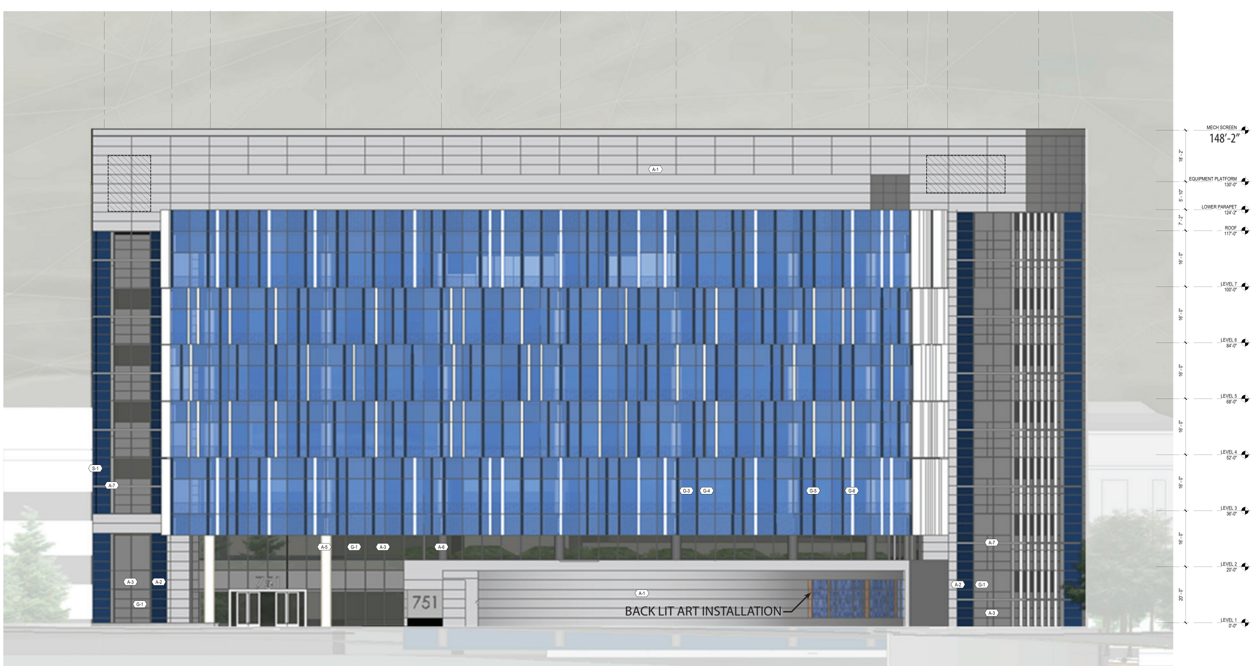


Figure 3-6
Conceptual Floor Plan (Floors 3 to 7)
751 Gateway Boulevard Project



North Elevation

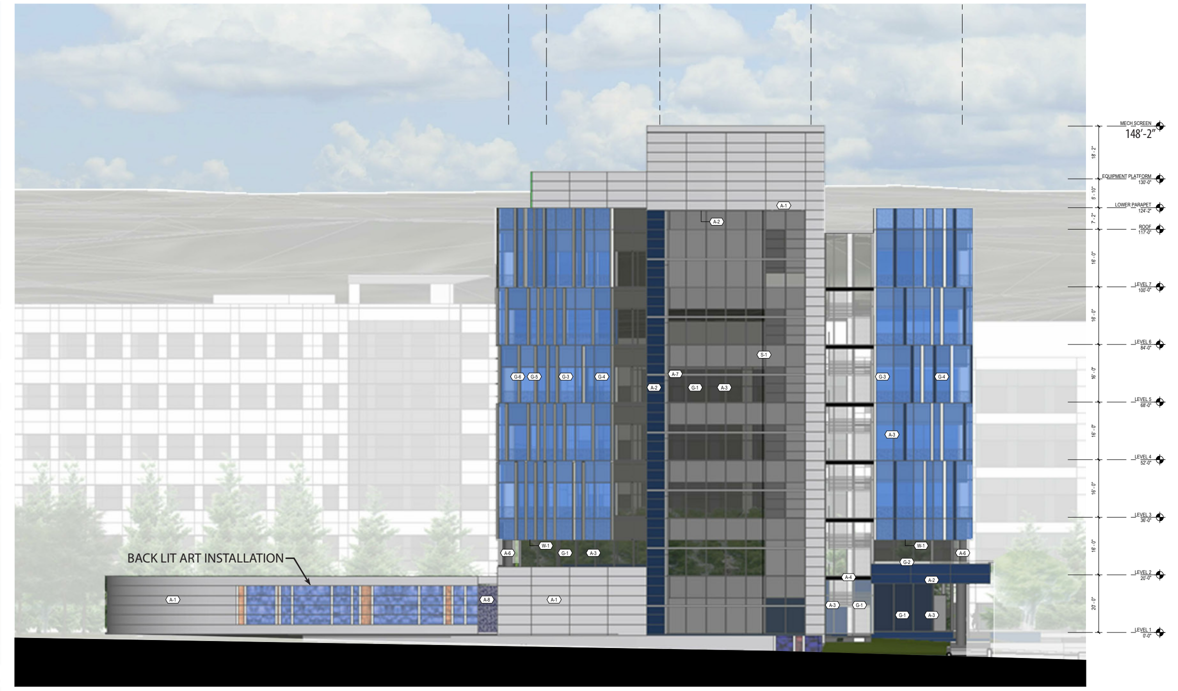


South Elevation

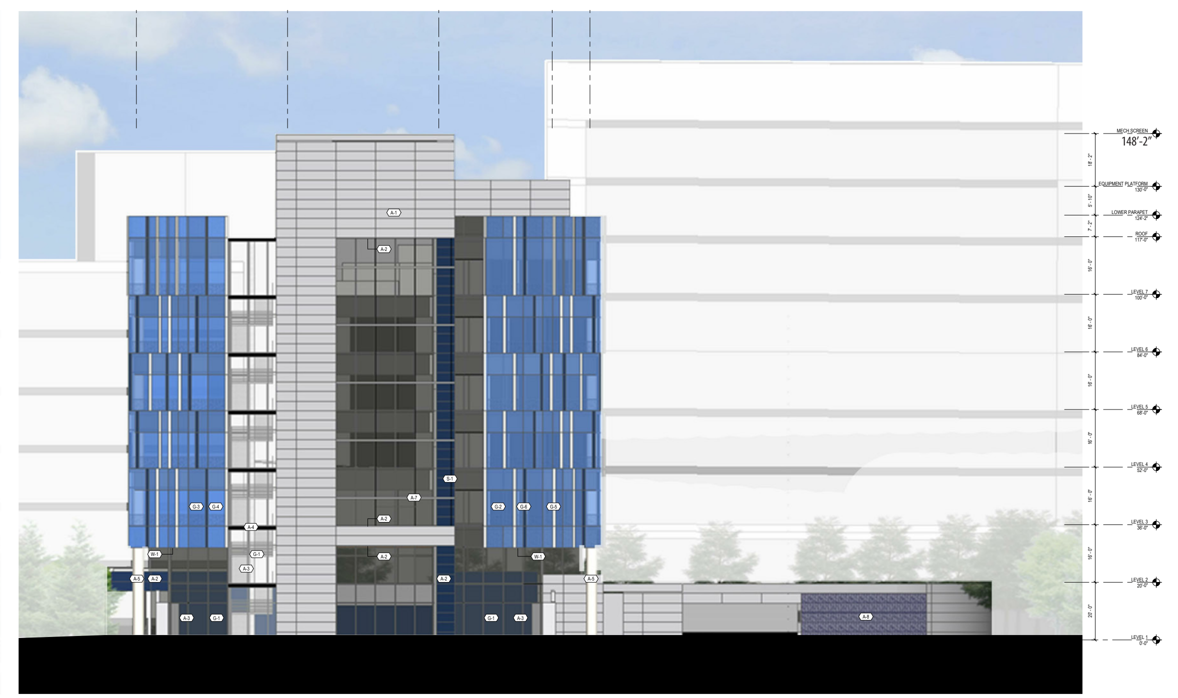
Source: RMW Architecture & Interiors, 2019

Graphics...00406.17 (1-15-20) AB

Figure 3-7
Conceptual Elevations (North and South)
751 Gateway Boulevard Project



East Elevation



West Elevation

Source: RMW Architecture & Interiors, 2019

Graphics...00406.17 (1-15-20) AB

Figure 3-8
Conceptual Elevations (East and West)
751 Gateway Boulevard Project

arrangement (2.5 spaces/1,000 gross square feet), 289 spaces would serve 681-685 Gateway Boulevard (lab) (2 spaces/1,000 gross square feet), 434 spaces would serve 701 Gateway Boulevard (office)(2.5 spaces/1,000 gross square feet), and 418 spaces would serve 751 Gateway Boulevard (lab) (2 spaces/1,000 gross square feet).

The project site would include a total of 418 parking spaces, including 42 parking spaces in a lot to be constructed north of the proposed building and 376 existing spaces in the rectangular parking lots in the southern portion of the project site. Of the total parking spaces, the proposed project would include nine accessible spaces that would be compliant with the Americans with Disabilities Act (ADA), 25 electric vehicle charging spaces, and 60 carpool spaces.

The proposed project would include 90 short-term bicycle parking spaces and 36 long-term bicycle parking spaces. The short-term bicycle parking spaces would be provided near the proposed entry plaza north of the proposed building, between the proposed outdoor amenity space and the service and loading yard south of the proposed building, and along the western side of the internal access drive near the existing building at 701 Gateway Boulevard. The long-term bicycle parking spaces would also be provided between the proposed outdoor amenity space and the service and loading yard. In addition, the proposed fitness center would include showers and clothes locker facilities.

A pedestrian walkway, also known as the Gateway pedestrian connection, would be constructed along Gateway Boulevard in the portion of the project site. The approximately 470-foot landscaped walkway would run parallel to the sidewalk and would connect pedestrians from the northern portion of the project site to the proposed building. In addition, pedestrian walkways would be constructed along the existing internal access drive to connect the proposed building to the rest of the Gateway Campus. The proposed project would also include a widened sidewalk and landscaping on the west side of Gateway Boulevard along the project frontage.

3.3.2.2 Site Landscaping and Open Space

The proposed project would include an outdoor entry plaza northwest of the proposed building and an outdoor amenity space southwest of the proposed building. Both the entry plaza and the amenity space would include landscaping, outdoor gathering areas, and seating areas. In addition, the project would include new landscaping along the perimeter of the site. The proposed project would include approximately 59,800 square feet of planted landscaped areas (not accounting for the proposed biotreatment areas, discussed below) and approximately 53,700 square feet of hardscape landscaped areas, for a total of 58,100 square feet of landscaped areas.

The proposed project would also include three biotreatment areas (e.g., planting areas), one near the entry plaza, one between the lot north of the proposed building and the Gateway pedestrian connection, and one immediately east of the proposed building. The biotreatment areas would total approximately 5,500 square feet.

The proposed project would include a total of 164 trees, accounting for the 175 existing trees to be removed (including three heritage trees and one protected tree), the 52 existing trees to remain, and the additional 112 trees to be planted.

3.3.2.3 Building Design

The proposed building would be constructed with contemporary materials and detailing, including white, light-blue, and dark-blue vision glass; solid aluminum panels; perforated aluminum panels; and metal railings and columns. The architectural style, which would include both vertical and horizontal elements (Figure 3-7 and 3-8), would include massing breaks, building openings, and wall planes that would combine architectural and landscaping features. The building construction type, per the California Building Code, would be Type III for the building frame. In addition, an interpretive art installation would be located along the pedestrian entry on Gateway Boulevard (Figure 3-7 [south elevation] and Figure 3-8 [east elevation]). Signage and lighting would be included at site entrances, along walkways, and in parking lots.

3.3.2.4 Employees

The proposed project would result in approximately 731 net new employees at the project site.[13] Upon project completion, there would be approximately 1,181 total employees on-site (including the 450 employees in the 701 Gateway building who would remain).

3.3.2.5 Infrastructure

As discussed above, the project site is serviced by existing water, wastewater, stormwater, natural gas, electric, telecommunications, and waste and recycling services. New on-site facilities would be connected to new services through the installation of new, localized connections. Expansion or an increase in capacity of off-site infrastructure would occur as required by the utility providers. The project could include off-site infrastructure improvements outside of the project site but within the Gateway Campus. Detailed descriptions of the proposed utility infrastructure are provided below.

Potable Water[14]

New water utilities would be placed around the perimeter of the project site and throughout the site. A new 6-inch lateral would connect to the existing 12-inch lateral on the project site. Two new 8-inch laterals for fire needs would be constructed as part of the project. One 8-inch lateral would connect to the existing 12-inch lateral on the project site. The other 8-inch lateral would connect to the 12-inch water main in Gateway Boulevard.

Stormwater[15]

The existing 18-inch storm pipe on the project site would be relocated around the proposed building and service and loading yard. New storm drain collector pipes and biotreatment areas (discussed above) would be constructed within the project site to drain to the existing 18-inch storm drain line in Gateway Boulevard.

---

13 The estimated number of employees is based on data provided by the project applicant; it assumes 60 percent of the proposed square footage (approximately 118,000 square feet) is R&D space and 40 percent of the proposed square footage (approximately 78,700 square feet) is office space. The average square footage per R&D employee is assumed to be 350, and the average square footage per office employee is assumed to be 200. The estimated number of employees associated with the proposed fitness center and café is accounted for in the estimate of the number of employees associated with the proposed R&D and office uses.

14 BKF. 2020. *701 and 751 Gateway Boulevard, South San Francisco Wet Utilities*. March 5.

15 Ibid.

Sanitary Sewer System[16,17]

The 12-inch gravity pipe outfall in Gateway Boulevard may need to be upsized as part of the proposed project. A new 8-inch lateral would be constructed on the project site to serve the proposed building. In addition, the existing 8-inch lateral that serves the 701 Gateway Boulevard building would need to be replaced with a 10-inch lateral.

Natural Gas and Electric

Electrical service and natural gas service would continue to be provided by PG&E. The proposed building would connect to the PG&E grid. Specifically, the project would construct 4-inch electrical conduits to connect to the existing electricity lines in Gateway Boulevard. In addition, the project would construct a 4-inch natural gas lateral to connect to a new natural gas meter that would connect to the existing 4-inch natural gas line in Gateway Boulevard.

Telecommunications

The project site would continue to be served by the existing telecommunication providers. The project would construct 3- to 4-inch communication conduits to connect to the existing communication lines in Gateway Boulevard.

Refuse and Recycling

The project site would continue to be served by the South San Francisco Scavenger Company and Blue Line Transfer Inc. Trash processing and loading areas at the proposed building would be on the south side of the building. Loading docks would be in the service and loading yard south of the proposed building and away from automobile and pedestrian circulation areas.

Mechanical Equipment

The proposed heating, ventilation, and air conditioning (HVAC) systems and mechanical equipment for the project would include two chillers and three boilers to serve the heating and cooling needs in the building, which would be located in a rooftop penthouse. Nine pumps would also be located in the penthouse. Four air-handling units, two cooling towers and six large exhaust fans would also be located on the roof behind a screen.

3.3.2.6 Sustainability

The proposed project would be designed to enhance resource efficiency and ensure good indoor environmental quality, as well as reduce energy consumption, water consumption, and waste generation. Examples of the proposed sustainability measures include low-flow shower heads, aerators, and toilets; Energy Star–rated appliances; electric vehicle charging spaces; and a waste diversion program that would separate compost, bottles/cans, paper and cardboard, and landfill materials. Proposed design elements, such as connectivity with employee shuttles (via the new shuttle stop along the western portion of the access drive north of the existing building at 701 Gateway Boulevard) and bicycle parking, would encourage alternative transportation modes. The

[16] Ibid.
[17] BKF. 2020. *751 Gateway Blvd – Sanitary Sewer Analyses.* March 27.

project would be designed to meet the standards of the South San Francisco Municipal Code and CALGreen building requirements. In addition, the project would be designed to meet LEED Gold certification as well as International WELL and Fitwel Building Institute Standards. [18,19] The proposed project would include construction of rooftop solar photovoltaic panel–ready connectivity to allow for the potential future installation of solar panels.

The proposed project would also be designed to conserve resources and protect water quality through the management of stormwater runoff as part of green infrastructure through low-impact development (LID). This approach implements engineered controls to allow stormwater filtering, storage, and flood control. Biotreatment areas would be located adjacent to the proposed building.

3.3.2.7 Construction

Construction of the project is scheduled to commence with site preparation in 2020 and end in winter 2021, lasting approximately 18 months, if the related entitlements are approved by the City. The project would include the following construction stages: (1) site preparation and demolition, (2) foundation installation, (3) building structure construction, (4) exterior and roof buildout, (5) interior buildout, and (6) commissioning and final inspections.

The hours of construction would be stipulated by the Building Division, and the project contractor would be required to comply with Section 8.32.050 of the South San Francisco Municipal Code (the South San Francisco Noise Ordinance), which includes regulations related to noise generated by construction. Project construction would typically occur Monday through Friday, between 7:00 a.m. and 5:00 p.m., although some work is anticipated to occur on Saturdays between 9:00 a.m. and 8:00 p.m. or on Sundays between 10:00 a.m. and 6:00 p.m. Approximately 15 instances of nighttime construction work would occur for concrete pours. Nighttime construction would begin approximately at 4:00 a.m. and be completed by 5:00 p.m. Construction is not anticipated to occur on major legal holidays.

Construction materials and equipment would be staged entirely on-site, in areas where construction is not occurring. Construction workers would park on the project site or use existing parking within the Gateway Campus. No temporary road closures that would affect the public right-of-way would be required during project construction. However, temporary sidewalk rerouting on Gateway Boulevard is expected to occur. Roadway traffic control would be used as needed during construction.

The proposed building would be constructed on a mat slab foundation. Piles would not be required. Demolition of the existing surface parking lot would generate approximately 300 cubic yards of concrete and asphalt waste. The proposed project would require grading or disturbing an area of approximately 149,000 square feet during construction. The proposed project would excavate

---

[18] The proposed project would be designed to meet WELL tenant-ready standards, but may not formally certify. The WELL standards are performance-based building standards for measuring and monitoring features within the built environment that may affect human health through air, water, light, and other concepts. The standards provide ways for buildings to be designed to improve human comfort and enhance health and wellness within the built environment.

[19] The Fitwel standards include evidence-based design and operational strategies that enhance a building's environment for its occupants. The Fitwel standards have seven health impact categories for evaluating a building, including, but not limited to, access to healthy food, opportunities for physical activity, and promotion of occupant safety.

approximately 1,850 cubic yards of soil that would be reused as fill on-site, and would import an additional 750 cubic yards of soil to be used as fill on-site. To accommodate utility trenches, the project would require a maximum depth of excavation reaching approximately 9 feet below ground surface. Construction activities for the proposed project would result in an average of up to approximately 13 daily construction truck trips during the most intensive construction stage and a maximum of approximately 110 daily construction worker round trips.

A stormwater pollution prevention plan (SWPPP) would be implemented during project construction. Project construction would use water from a metered hydrant (up to 1,600 gallons a day, maximum). No dewatering would be required during project construction.

For construction and demolition, 100 percent of all inert solids (building materials) and 65 percent of non-inert solids (all other materials) would be recycled as required by the City under Chapter 15.60 of the South San Francisco Municipal Code.

3.3.3 Transportation Demand Management Plan

The proposed project would require submittal of a TDM plan to the Planning Division for review and approval as part of the entitlement process, per the requirements of the South San Francisco Municipal Code and the General Plan. The City's TDM program is intended to reduce the amount of traffic generated by new development, reduce the share of drive-alone traffic during peak periods, and incentivize the use of alternative modes of transportation. The TDM plan may be refined during the planning review process for project entitlements. The TDM plan lays out policies and strategies to reduce peak-hour travel demand and encourage alternative modes of transportation that reduce single-occupant vehicle use. Although SSFMC Section 20.400 does not call out a specific alternate mode-share (AMS) requirement for the Gateway Specific Plan District, similar zoning districts, as well as General Plan requirements in the East of 101 area, require an AMS of 35–40 percent for development of a FAR of 1.0–1.25. This standard would be applied to the 751 Gateway Boulevard Project, consistent with City requirements and policies to increase AMS and decrease single-occupancy vehicle traffic. . Although the regulatory TDM requirements call for a 35–40 percent AMS, the CEQA analysis assumes a higher and more conservative drive-alone share (AMS of 26 percent), consistent with the City/County Association of Governments of San Mateo County model and analysis for other similar projects within the City and the region. The proposed project would include a flexible TDM plan, which would include the requirements listed below, to achieve an alternative mode use goal[20] of 35 percent for the proposed project within the first three years of reporting, with an increase to 40 percent in the fourth year of reporting:[21]

- Carpool and vanpool ride-matching services
- Designated employer contact
- Direct route to transit
- Guaranteed ride home for emergency situations

[20] The alternative mode use goal indicates the percentage of total trips that would use alternative transportation modes rather than single-occupancy vehicle trips.

[21] Silvani Transportation Consulting. 2019. *Proposed Transportation Management Plan: 751 Gateway Blvd., South San Francisco CA.* December.

- Information boards and kiosks
- Passenger loading zones
- Pedestrian connections
- Promotional programs (e.g., new tenant and employee orientation packets on transportation alternatives)
- Showers and clothes lockers
- Shuttle program
- Transportation Management Association participation
- Short- and long-term bicycle parking
- Free parking for carpools and vanpools

As part of the TDM plan, additional measures may be implemented (e.g., compressed work week, on-site amenities, and telecommuting). To ensure that the measures from the TDM plan would be effective and implemented, the SSFMC requires that the applicant administer an annual commuter survey to monitor the plan and report the results to the City on an annual basis. If the TDM plan requirements are not met, the applicant would be required to adjust its TDM strategies in order to meet the project's required AMS.

3.3.4 Lead Agency Approvals

Table 3-3 lists the anticipated permits and approvals that would be required for the proposed project.

Table 3-3. Required Permits and Approvals for the Proposed Project

Agency	Permit/Review Required
City of South San Francisco	Planning Commission: • Design Review • Precise Plan Approval • TDM Plan Approval • Conditional Use Permit to Authorize a Parking Reduction to 2.5 spaces/1,000 gross square feet in a shared parking format for the 751 Gateway Boulevard portion of the Gateway Campus • EIR Certification, Adoption of CEQA Findings of Fact, Adoption of Mitigation Monitoring and Reporting Program, Adoption of Statement of Overriding Considerations (if required) Engineering Division: • Grading Permit(s) • Encroachment Permit(s) • Site Plan Check • Hauling Permit(s) Building Division: • Building Permit(s) • Certificate of Occupancy Parks and Recreation Department: • Protected Tree Removal Permit Other: • Fire Code Compliance
California Regional Water Quality Control Board	Clean Water Act Section 402 National Pollutant Discharge Elimination System General Construction Stormwater Permit and Stormwater Pollution Prevention Plan
Bay Area Air Quality Management District	Stationary source permit for the generator
Federal Aviation Administration	Notice of Proposed Construction and Alteration and Federal Aviation Administration Determination per Code of Federal Regulations Title 14, Part 77.9

Chapter 4
Environmental Setting, Impacts, and Mitigation

4.1 Approach to Environmental Analysis

4.1.1 Introduction to Analysis

This section describes the format of the environmental analysis in each environmental topic section of the chapter; discusses the effect of Public Resources Code Section 21099 on the scope of California Environmental Quality Act (CEQA) analysis for the project; and explains the general approaches to baseline setting and cumulative analysis in this EIR.

In December 2015, the California Supreme Court found that "CEQA generally does not require an analysis of how existing environmental conditions will impact a project's future users or residents," unless the project "could exacerbate hazards that are already present." The Supreme Court identified several exceptions to this general rule in which CEQA could apply to impacts of the environment on the project, all of which are statutory provisions in CEQA that specifically require consideration of impacts of the environment, such as consideration of projects near airports, school construction projects, and statutory exemptions from housing and transit priority projects. (*California Building Industry Assoc. v. Bay Area Air Quality Management District* (2015) 62 Cal.4th 369). None of these exceptions apply to the project; as such, this environmental impact report does not draw significance conclusions for those topics for which the environment could have an effect on the project.

4.1.2 Format of the Environmental Analysis

Sections 4.2 through 4.10 address the physical environmental effects of the proposed project on the required CEQA environmental topics, as follows:

Section 4.2, *Air Quality*

Section 4.3, *Biological Resources*

Section 4.4, *Cultural Resources and Tribal Cultural Resources*

Section 4.5, *Energy*

Section 4.6, *Geology and Soils*

Section 4.7, *Greenhouse Gas Emissions*

Section 4.8, *Noise and Vibration*

Section 4.9, *Transportation and Circulation*

Section 4.10, *Less-than-Significant Impacts*

4.10.1, *Aesthetics*

4.10.2, *Agricultural and Forest Resources*

4.10.3, *Hazards and Hazardous Materials*

4.10.4, *Hydrology and Water Quality*

4.10.5, *Land Use*

4.10.6, *Mineral Resources*

4.10.7, *Population and Housing*

4.10.8, *Public Services*

4.10.9, *Recreation*

4.10.10, *Utilities*

4.10.11, *Wildfire*

Sections 4.2 through 4.9 contain the following subsections: Environmental Setting, Regulatory Framework, and Impacts and Mitigation Measures, described below. In accordance with CEQA Guidelines Section 15128, Section 4.10 provides a brief discussion of topics where the proposed project would have less-than-significant impacts or no impacts, and therefore are not discussed in detail in this EIR. For each topic, Section 4.10 includes a brief description of the regulatory framework, significance criteria, and approach to analysis, and the lead agency's reasons for determining that there would be no impact or a less than significant impact.

4.1.2.1 Environmental Setting

The Environmental Setting subsection describes the existing conditions in the project site and the project vicinity as they relate specifically to that environmental topic. The description of existing environmental conditions serves as the "baseline" for measuring the changes to the environment that would result from the project and for determining whether those environmental effects would be significant. In general, existing conditions are the physical conditions that existed at the time that the Notice of Preparation (NOP) for the proposed project is issued (CEQA Guidelines Section 15125(a)).

However, in accordance with CEQA Guidelines Section 15125(a), the EIR baseline may include projects that are approved and may be under construction. The EIR baseline may also take into account former conditions or circumstances that have changed prior to publication of the NOP. The modified existing conditions that serve as the baseline for the analysis of environmental impacts are further described below in Section 4.1.4, *Approach to Baseline Setting*.

4.1.2.2 Regulatory Framework

The Regulatory Framework subsection describes federal, state, regional, and local regulatory requirements that are directly applicable to the environmental topic.

4.1.2.3 Impacts and Mitigation Measures

The Impacts and Mitigation Measures subsection describes the physical environmental impacts of the proposed project for each topic, as well as any mitigation measures that could reduce potentially significant impacts to less-than-significant levels. This subsection begins with a listing of the significance criteria used to assess the severity of the environmental impacts for that particular topic based on the CEQA Guidelines Appendix G checklist. Environmental topic sections also include a topic-specific "Approach to Analysis" explaining the parameters, assumptions, and data used in the analysis.

Under the "Impact Evaluation" discussion, the project-level impact analysis for each topic begins with an impact statement that reflects the applicable significance criteria. Some significance criteria may be combined in a single impact statement, if appropriate. Each impact statement is keyed to a subject area abbreviation (e.g., AQ for Air Quality) and an impact number (e.g., 1, 2, 3) for a combined alpha-numeric code (e.g., Impact AQ-1, Impact AQ-2, Impact AQ-3). When potentially significant impacts are identified, mitigation measures are presented, if feasible, to avoid, eliminate, or reduce significant adverse impacts of the project. Each mitigation measure is numbered to correspond to the impact statement to which it pertains (e.g., Mitigation Measure MM-AQ-1 corresponds to Impact AQ-1). If there is more than one mitigation measure for the same impact statement, the mitigation measure numbers include a lowercase letter suffix (e.g., Mitigation Measures MM-AQ-1a and AQ-1b).

Each impact statement describes the impact that would occur without mitigation. The level of significance of the impact is indicated in parentheses at the end of the impact statement based on the following terms:

- No Impact – No adverse physical changes (or impacts) to the environment are expected.
- Less than Significant – Impact that does not exceed the defined significance criteria or would be eliminated or reduced to a less-than-significant level through compliance with existing local, state, and federal laws and regulations.
- Less than Significant with Mitigation – Impact that is reduced to a less-than-significant level through implementation of the identified mitigation measures.
- Significant and Unavoidable with Mitigation – Impact that exceeds the defined significance criteria and can be reduced through compliance with existing local, state, and federal laws and regulations and/or implementation of all feasible mitigation measures, but cannot be reduced to a less-than-significant level.
- Significant and Unavoidable – Impact that exceeds the defined significance criteria and cannot be eliminated or reduced to a less-than-significant level through compliance with existing local, state, and federal laws and regulations and for which there are no feasible mitigation measures.

In accordance with CEQA Guidelines Section 15130, the potential for the proposed project to result in significant cumulative impacts when combined with other current and future projects is described in a separate subsection following the project-level impact analysis for each environmental topic. Cumulative impact statements are numbered consecutively for each impact statement with an alpha-numeric code to signify it is a cumulative impact.

4.1.3 Public Resources Code Section 21099

Public Resources Code Section 21099 requires that the Office of Planning and Research (OPR) amend the CEQA Guidelines to provide an alternative to level of service (LOS) for evaluating traffic impacts of proposed projects. The new Guidelines must establish criteria that "promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." Public Resources Code Section 21099(b)(2) states that upon certification of the revised guidelines for determining transportation impacts pursuant to Section 21099(b)(1), automobile delay, as described solely by level of service or similar measures of vehicular capacity or traffic congestion, shall not be considered a significant impact on the environment under CEQA.

Senate Bill (SB) 743[1] is intended to better align CEQA transportation impact analysis practices and mitigation outcomes with the State's goals to reduce greenhouse gas (GHG) emissions, encourage infill development, and improve public health through more active transportation. SB 743 creates several key statewide changes to CEQA, as described in Section 4.9, *Transportation and Circulation*. To aid in SB 743 implementation, the following State guidance has been produced:

1 Full text of SB 743: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140SB743

- OPR's *Technical Advisory on Evaluating Transportation Impacts in CEQA*[2]
- California Air Resources Board's (CARB's) *2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals*[3]
- California Department of Transportation's (Caltrans') *Local Development–Intergovernmental Review Program Interim Guidance, Implementing Caltrans Strategic Management Plan 2015–2020 Consistent with SB 743*[4]

A vehicle miles traveled (VMT) impact analysis is provided in Section 4.9, *Transportation and Circulation*. The topic of automobile delay, nonetheless, may be considered by decision-makers, independent of the environmental review process, as part of their decision to approve, modify, or disapprove the proposed project. Therefore, a discussion of automobile delay is provided for informational purposes. The VMT metric does not apply to the analysis of impacts on non-automobile modes of travel such as riding transit, walking, and bicycling.

4.1.4 Approach to Baseline Setting

Project development characteristics are typically compared to the existing physical environment to isolate impacts caused by the project on its surroundings. In other words, the existing condition (also referred to as the environmental setting) is normally the baseline against which the project's impacts are measured to determine whether impacts are significant. Therefore, the Environmental Setting subsection of each topic describes existing conditions on and around the project site. These existing conditions are ordinarily established as of the date that the NOP is published. In some circumstances, however, it is appropriate to use a different baseline to identify project impacts to account for circumstances that can change over time during the course of the environmental review, project construction, and operation.

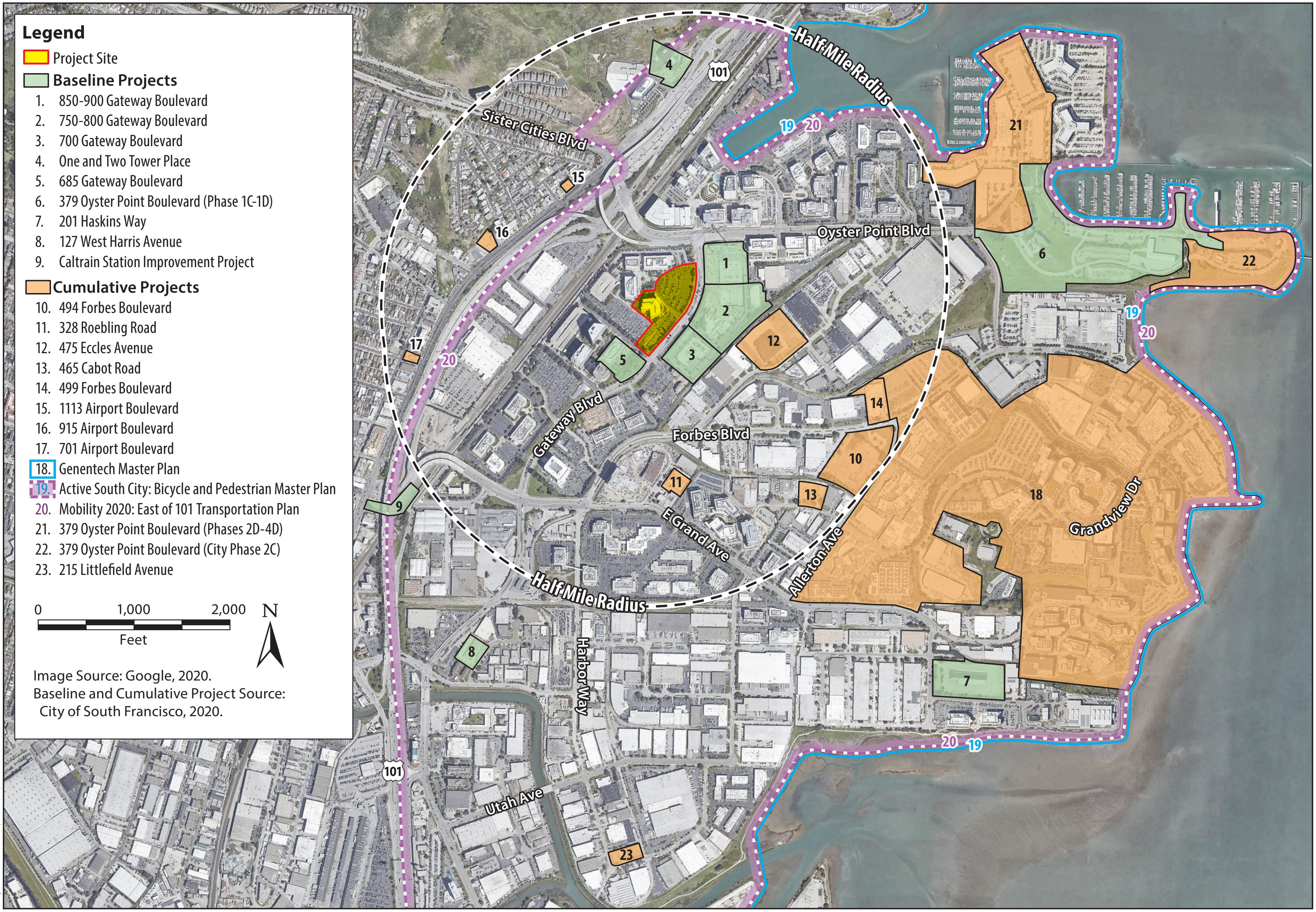
Figure 4.1-1 shows the location of baseline projects and cumulative projects in the City that were considered in the analysis for the proposed project. Baseline projects are development projects within 0.5 mile of the project site that are approved and may currently be under construction. As discussed below, the final adjusted baseline also accounts for several projects in the City that are located more than 0.5 mile from the project site, but are within the same infrastructure network as the project site. The baseline condition for the proposed project includes the existing uses on the two project site parcels (Assessor's Parcel Numbers 015-024-290 and 015-24-360).

---

[2] Office of Planning and Research. 2018. *Technical Advisory on Evaluating Transportation Impacts in CEQA*. December. Available: http://opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf. Accessed: June 10, 2020.

[3] California Air Resources Board. 2017. *2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals*. January. Available: https://ww2.arb.ca.gov/sites/default/files/2019-01/2017_sp_vmt_reductions_jan19.pdf. Accessed: June 10, 2020.

[4] California Department of Transportation. 2016. *Local Development–Intergovernmental Review Program Interim Guidance, Implementing Caltrans Strategic Management Plan 2015–2020 Consistent with SB 743*. November. Available: https://dot.ca.gov/programs/transportation-planning/office-of-smart-mobility-climate-change/sb-743. Accessed: June 10, 2020.



Graphics...00662.19 (8-3-2020) JC

Figure 4.1-1
Location of Baseline and Cumulative Projects
751 Gateway Boulevard Project

The baseline projects listed below are considered part of the baseline condition against which the proposed project would be evaluated for environmental impacts, with the exception of the transportation analysis; the baseline condition for the transportation analysis represents existing conditions as of 2019 because the transportation analysis uses data collected in fall 2019 (before the COVID-19 pandemic, which substantially altered traffic patterns) for the existing office and research and development (R&D) campus adjacent to the project site.

For several physical environmental topics, project-related impacts are unlikely to interact with conditions greater than a 0.5-mile radius from the project site (e.g., aesthetics, geology and soils, hazards and hazardous materials, and noise and vibration). However, some impacts related to air quality, biological resources, greenhouse gas (GHG) emissions, population growth, and water quality can affect existing conditions on a more regional scale. Several other projects in the City are located more than 0.5 mile from the project site and are confined by the same infrastructure network, particularly regarding transportation and circulation, public services, and utilities and service systems. Therefore, the impacts generated by these projects have also been considered to provide a final adjusted baseline in order to properly reflect conditions against which the proposed project is analyzed.

Cumulative projects, which are discussed in more detail in Section 4.1.5 below, are considered reasonably foreseeable future development projects, transportation projects, or planning projects for which the City had an application on file but that have not been approved and for which construction had not commenced as of publication of the NOP for the proposed project (January 21, 2020) and/or projects that the City has otherwise determined are reasonably foreseeable.

The following baseline projects are located within an approximately 0.5-mile radius of the project site (the numbers are keyed to Figure 4.1-1):

1. **850–900 Gateway Boulevard:** Phase 1 of Gateway Business Park Master Plan, which includes construction of two office/R&D buildings (12 and five stories) totaling 451,485 square feet with a two-level subterranean parking garage and a 47,938-square-foot amenity building on a 6.3-acre site. (Entitled April 2013; construction to be completed in quarter 3 of 2020)
2. **750–800 Gateway Boulevard**: Phase 2 of Gateway Business Park Master Plan, which includes construction of an office/R&D building consisting of eight-story and nine-story building wings connected by an atrium, totaling 390,534 square feet, with a two-level subterranean parking garage and a seven-level parking structure on a 5.0-acre site. *(Entitled December 2018; construction to be completed in quarter 3 of 2021)*
3. **700 Gateway Boulevard**: Phase 3 of Gateway Business Park Master Plan, which includes construction of one office/R&D building (11 stories) totaling 314,395 square feet with a five-level parking garage on a 4.5-acre site. *(Entitled December 2018; construction to be completed in quarter 3 of 2021)*
4. **One and Two Tower Place**: Construction of two office towers totaling 665,000 square feet, including 24,000 square feet of commercial space, a 200-seat performing arts center, day care center for 100 children, and an amenity building, consisting of a 110-room hotel, wellness center, restaurant, retail, and various amenities adjacent and connected to the North Tower. *(North Tower construction complete, amenity building construction to be completed in quarter 4 of 2020, hotel to be determined)*

5. **685 Gateway Boulevard**: Precise Plan modification to construct a new 15,400-square-foot amenity building and outdoor dining area on a 3-acre site shared with the 681 Gateway Campus. *(Entitled March 2019; construction to be completed in quarter 3 of 2020)*

The following baseline projects are located in the East of 101 area (the numbers are keyed to Figure 4.1-1)

6. **379 Oyster Point Boulevard (Phase 1C-1D)**: Construction of three 6-story office/R&D buildings totaling 508,000 square feet on a 10-acre parcel, including a parking structure, new road alignment with utilities, new park at Oyster Point Boulevard and Marina Boulevard, Bay Trail improvements, and a new open space parcel. *(Entitled March 2011; construction to be completed in quarter 3 of 2020)*
7. **201 Haskins Way:** Demolition of the existing building and construction of a new 280,765-square-foot office/R&D building and a five-level parking garage on a 6.5-acre site. *(Entitled March 2019; construction to be completed in quarter 1 of 2021)*
8. **127 West Harris Avenue:** Construction of a five-story hotel with 128 rooms on a 64,117-square-foot lot. *(Entitled August 2015; construction to be completed in quarter 3 of 2020)*
9. **Caltrain Station Improvement Project:** The project will realign the existing South San Francisco Caltrain station to allow easier pedestrian access to downtown, as well as improve station safety and disabled access. An underpass and plaza will be constructed to allow pedestrians access from downtown to the newly renovated station and to the east side of U.S. 101*. (Construction initiated quarter 4 of 2017; construction to be completed in 2021)*

4.1.5 Approach to Cumulative Impact Analysis

Cumulative impacts are two or more individual effects which, when considered together, are considerable or which compound or increase environmental impacts. The individual effects may be changes resulting from a single project or a number of separate projects. Cumulative impacts are impacts of the project in combination with other closely related past, present, and reasonably foreseeable probable future projects (CEQA Guidelines Section 15355(a)-(b)). The following factors are considered to determine the level of cumulative analysis in this EIR:

- Similar Environmental Impacts – A relevant project contributes to effects on resources that are also affected by a proposed project. A relevant future project is defined as one that is “reasonably foreseeable,” such as a proposed project for which an application has been filed with the approving agency or has approved funding.
- Geographic Scope and Location – A relevant project is located within the geographic area within which effects could combine. The geographic scope varies on a resource-by-resource basis. For example, the geographic scope for evaluating cumulative effects on air quality consists of the affected air basin, while the geographic scope for evaluating cumulative effects on traffic typically consists of the roadways within the region that could carry additional vehicles as a result of net new VMT generated by the proposed project.
- Timing and Duration of Implementation – Effects associated with activities for a relevant project (e.g., short-term construction or demolition, or long-term operations) would likely coincide in timing with the related effects of a proposed project.

CEQA Guidelines Section 15130(b)(1) sets forth two primary approaches to the analysis of cumulative impacts. The analysis can be based on (1) a list of past, present, and probable future projects producing related impacts that could combine with those of a proposed project or (2) a summary of projections contained in a general plan or related planning document. For the purposes of this EIR, past and present projects that are approved and may be under construction are discussed as a part of the baseline, as established above. Any additional reasonably foreseeable probable future projects are considered further in cumulative impact analysis. The cumulative impact analysis in this draft EIR generally employs either a list-based approach or a projections approach, depending on which approach best suits the individual resource topic being analyzed.

The cumulative analyses for those topics using a list-based approach typically consider individual projects from a list of nearby future projects anticipated in the project vicinity (i.e., within approximately 0.5 mile of the project site). The particular projects to be considered in the cumulative analysis for each topic vary by environmental topic and are appropriately tailored to the particular environmental topic based on the potential for combined localized environmental impacts under the topic.

Presented below is a numbered list of reasonably foreseeable probable future projects. Generally, these are projects for which the City had an application on file but that have not been approved as of publication of the NOP for the proposed project (January 21, 2020) and/or projects that the City has otherwise determined are reasonably foreseeable. These projects are mapped on Figure 4.1-1 on p. 4.1-5.

For some physical environmental topics, project-related impacts are unlikely to interact with conditions greater than a 0.5-mile radius from the project site (e.g., aesthetics, geology and soils, hazards and hazardous materials, and noise and vibration). However, some impacts related to air quality, biological resources, GHG emissions, population growth, and water quality can affect existing conditions on a more regional scale. Several other City projects are located more than 0.5 mile from the project site and are confined by the same infrastructure network, particularly with regard to transportation and circulation, public services, and utilities and service systems.

The following cumulative projects are located within an approximate 0.5-mile radius of the project site (the number is keyed to Figure 4.1-1):

10. **494 Forbes Boulevard**: Construction of two four-to-five story research and development office buildings totaling 326,020 square feet and a three-level parking structure on a 7.5 acre site. *(Original entitlement December 2012, Design Review Modification – Planning Commission hearing November 2019; construction date to be determined)*
11. **328 Roebling Road**: Demolition of an existing building (79,501 square feet), and construction two office/R&D buildings totaling 105,536 square feet and at grade and subterranean parking on a 2.97-acre site. *(Entitled June 2020; construction date to be determined)*
12. **475 Eccles Avenue**: Construction of two four-story office/R&D buildings totaling approximately 262,287 square feet, and a five-level parking structure on a 6.1-acre site. *(Entitled August 2016; construction date to be determined)*
13. **465 Cabot Road**: Construction of a new 34,365 square foot two-story office and service center. *(Entitled October 2018; permit issued September 2019)*

14. **499 Forbes Boulevard**: Construction of a five-story office/R&D building totaling 128,737 square feet, and a four-level parking structure on a 3-acre site. *(Under review; construction date to be determined)*

15. **1113 Airport Boulevard**: Construction of 12 additional guest rooms to the second and third floor of an existing 24-room hotel. *(Entitled January 2017; construction date to be determined)*

16. **915 Airport Boulevard**: Construction of a five-story hotel with 115 rooms on a 28,894-square-foot site. *(Under review; construction date to be determined)*

17. **701 Airport Boulevard**: Construction of a five-story hotel with 131 rooms on a 20,239-square-foot site. *(Incomplete. Project review on hold by the applicant; construction date to be determined)*

18. **Genentech Master Plan**: The Master Plan outlines a potential expansion that would allow the Central Campus to grow to approximately six million square feet during the 10-year planning period. This expansion represents a 100 percent increase in space compared with the current Central Campus development. The Master Plan indicates that Genentech will meet its potential space requirements by both the redevelopment of buildings that Genentech currently owns and occupies and by the redevelopment of expansion property that Genentech has recently acquired or may acquire in the ten-year planning period. *(Planning period is ongoing)*

19. ***Active South City: Bicycle and Pedestrian Master Plan***: The *Active South City: Bicycle and Pedestrian Master Plan* will update existing plans and identify needs and opportunities to improve walking and bicycling in the City The plan recommends a comprehensive and integrated system of bikeways that promote bicycle riding for transportation and recreation. The recommendations are intended to provide safer, more direct bicycle routes through residential neighborhoods, employment and shopping areas, and to transit stops. The development of this plan is set forth in the City's General Plan. *(Plan development is ongoing)*

20. **Mobility 2020 – East of 101 Transportation Plan:** The plan strives to achieve a more balanced transportation system where walking, biking, transit use, and carpooling are as convenient as driving. The Mobility Plan identifies projects, policies, and programs to support the transition to a robust multimodal network. *(Plan implementation is ongoing)*

The following cumulative projects are located in the East of 101 area (the number is keyed to Figure 4.1-1):

21. **379 Oyster Point Boulevard (Phases 2D-4D):** Current entitlements allow up to 1.7 million square feet of office/R&D buildings in Phases 2–4 on current Oyster Point Business Park properties. *(Master Plan approved March 2011, Precise Plan submitted August 2019; construction date to be determined)*

22. **379 Oyster Point Boulevard (City Phase 2C):** Phase IIC improvements will take place on City-owned land managed by the Harbor District. They include a new pump station, repairs to the landfill clay cap, improved parking areas and landscaping. To complement the planned improvements, a planning effort will take place to set a vision for new land uses in the marina area. This effort will be conducted in partnership with the Harbor District and public stakeholders. *(Schedule for planning; construction date has not yet been determined)*

23. **215 Littlefield Avenue:** Construction of an 11,585-square-foot addition and exterior modifications to a newspaper and radio building. *(Planning Commission approved February 2020; construction date to be determined)*

The 1999 General Plan is currently being updated as part of the *Shape SSF 2040 General Plan*.[5] The 1999 General Plan remains active until completion and adoption of the new general plan. The general plan update is currently in progress and is not considered in the cumulative analysis. It is anticipated that approval of the general plan update will occur in quarter 4 of 2022.

[5] City of South San Francisco. 2020. Shape SSF 2040 General Plan. Available: https://shapessf.com/. Accessed: May 8, 2020.

4.2 Air Quality

4.2.1 Introduction

This section describes the environmental and regulatory setting for air quality. It also describes impacts associated with air quality that would result from implementation of the proposed project and mitigation for significant impacts where feasible and appropriate.

4.2.2 Environmental Setting

The project site is located within the San Francisco Bay Area Air Basin (SFBAAB). Ambient air quality is affected by climatological conditions, topography, and the types and amounts of pollutants emitted. The following sections summarize how air pollution moves through the air, water, and soil within the air basin as well as how it is chemically changed in the presence of other chemicals and particles. This section also summarizes regional and local climate conditions, existing air quality conditions, and the sensitive receptors that may be affected by the project-generated emissions.

4.2.2.1 Pollutants of Concern

Criteria Pollutants

The federal and state governments have established ambient air quality standards for six criteria pollutants. Ozone is considered a regional pollutant because its precursors affect air quality on a regional scale. Pollutants such as carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead are considered local pollutants that tend to accumulate in the air locally. Particulate matter (PM) is both a regional and local pollutant. The primary criteria pollutants generated by the project are ozone precursors (nitrogen oxides [NO_X] and reactive organic gases [ROGs]), CO, and PM.[1,2,3]

All criteria pollutants can have human health effects at certain concentrations. The ambient air quality standards for these pollutants are set to protect public health and the environment with an adequate margin of safety (Clean Air Act [CAA] Section 109). Epidemiological, controlled human exposure, and toxicology studies evaluate potential health and environmental effects of criteria pollutants, and form the scientific basis for new and revised ambient air quality standards.

The principal characteristics of the primary criteria pollutants generated by the project, as well as possible health and environmental effects from exposure, are discussed below.

---

[1] As discussed above, there are also ambient air quality standards for SO_2, lead, sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. However, these pollutants are typically associated with industrial sources, which are not included as part of the project. Accordingly, they are not evaluated further.

[2] Most emissions of NO_X are in the form of nitric oxide. Conversion to NO_2 occurs in the atmosphere as pollutants disperse downwind. Accordingly, NO_2 is not considered a local pollutant of concern for the project and is not evaluated further.

[3] Reşitoğlu, Ibrahim A. 2018. *NO_X Pollutants from Diesel Vehicles and Trends in Control Technologies.* Published November 5. DOI: 10.5772/intechopen.81112. Available: https://www.intechopen.com/online-first/nox-pollutants-from-diesel-vehicles-and-trends-in-the-control-technologies. Accessed: January 6, 2020.

Ozone, or smog, is a photochemical oxidant that is formed when ROG and NO_X (both by-products of the internal combustion engine) react with sunlight. ROG compounds are made up primarily of hydrogen and carbon atoms. Internal combustion associated with motor vehicle usage is the major source of hydrocarbons. Other sources of ROG are emissions associated with the use of paints and solvents, the application of asphalt paving, and the use of household consumer products such as aerosols. The two major forms of NO_X are nitric oxide (NO) and NO_2. NO is a colorless, odorless gas that forms from atmospheric nitrogen and oxygen when combustion takes place under high temperature and/or high pressure. NO_2 is an irritating reddish-brown gas that forms when NO and oxygen combine. In addition to serving as an integral participant in ozone formation, NO_X acts as an acute respiratory irritant and increases susceptibility to respiratory pathogens.

Ozone poses a higher risk to those who already suffer from respiratory diseases (e.g., asthma), such as children, older adults, and people who are active outdoors. Exposure to ozone at certain concentrations can make breathing more difficult, cause shortness of breath and coughing, inflame and damage the airways, aggravate lung diseases, increase the frequency of asthma attacks, and cause chronic obstructive pulmonary disease. Studies show associations between short-term ozone exposure and non-accidental mortality, including deaths from respiratory issues. Studies also suggest long-term exposure to ozone may increase the risk of respiratory-related deaths.[4] The concentration of ozone at which health effects are observed depends on an individual's sensitivity, level of exertion (i.e., breathing rate), and duration of exposure. Studies show large individual differences in the intensity of symptomatic responses, with one study finding no symptoms to the least responsive individual after a 2-hour exposure to 400 parts per billion of ozone and a 50 percent decrease in forced airway volume in the most responsive individual. Although the results vary, evidence suggests that sensitive populations (e.g., asthmatics) may be affected on days when the 8-hour maximum ozone concentration reaches 80 parts per billion.[5] The average background level of ozone in the Bay Area is approximately 45 parts per billion.[6]

In addition to human health effects, ozone has been tied to crop damage, typically in the form of stunted growth, leaf discoloration, cell damage, and premature death. Ozone can also act as a corrosive and oxidant, resulting in property damage (e.g., degradation of rubber products and other materials).

Carbon monoxide is a colorless, odorless, toxic gas produced by incomplete combustion of carbon substances, such as gasoline or diesel fuel. In the study area, high CO levels are of greatest concern during the winter when periods of light winds combine with ground-level temperature inversions from evening through early morning. These conditions trap pollutants near the ground, reducing the dispersion of vehicle emissions. Moreover, motor vehicles exhibit increased CO emission rates at low air temperatures. The primary adverse health effect associated with CO is

---

4 U.S. Environmental Protection Agency. 2018a. *Ground-level Ozone Basins.* Last updated: October 31. Available: https://www.epa.gov/ground-level-ozone-pollution/ground-level-ozone-basics#wwh. Accessed: January 6, 2020.

5 U.S. Environmental Protection Agency. 2016. *Health Effects of Ozone in the General Population.* Last updated September 12, 2016. Available: https://www.epa.gov/ozone-pollution-and-your-patients-health/health-effects-ozone-general-population. Accessed: January 6, 2020.

6 Bay Area Air Quality Management District. 2017a. *Final 2017 Clean Air Plan.* Adopted: April 19. Available: https://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en. Accessed: January 6, 2020.

interference with normal oxygen transfer to the blood, which may result in tissue oxygen deprivation. Exposure to CO at high concentrations can also cause fatigue, headaches, confusion, dizziness, and chest pain. There are no ecological or environmental effects of CO at or near existing background CO levels.[7]

Particulate matter consists of finely divided solids or liquids (e.g., soot, dust, aerosols, fumes, mists). Two forms of particulates are generally considered: inhalable course particles, or PM10, and inhalable fine particles, or PM2.5. A particulate discharge into the atmosphere results primarily from industrial, agricultural, construction, and transportation activities. However, wind on arid landscapes also contributes substantially to local particulate loading.

Particulate pollution can be transported over long distances and may affect human health adversely, especially people who are naturally sensitive or susceptible to breathing problems. Numerous studies have linked PM exposure to premature death in people with preexisting heart or lung disease, nonfatal heart attacks, an irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms. Studies show that long-term exposure to PM2.5 was associated with an increased risk of mortality, ranging from a 6 to 13 percent increased risk for every 10 micrograms per cubic meter ($\mu g/m^3$) of PM2.5.[8] Every 1 $\mu g/m^3$ reduction in PM2.5 results in a 1 percent reduction in the mortality rate for individuals over 30 years old.[9] Studies also show an increase in overall mortality of approximately 0.5 percent for every 10 mg/m^3 increase in PM10 measured the day before death.[10] However, PM10 levels have been greatly reduced since 1990. Peak concentrations have declined by 60 percent, and annual average values have declined by 50 percent.[11] Depending on the composition, both PM10 and PM2.5 can also affect water quality and acidity, deplete soil nutrients, damage sensitive forests and crops, affect ecosystem diversity, and contribute to acid rain.[12]

Toxic Air Contaminants

Although ambient air quality standards have been established for criteria pollutants, no ambient standards exist for toxic air contaminants (TACs). Many pollutants are identified as TACs because of their potential to increase the risk of developing cancer or because of their acute or chronic health

---

7 California Air Resources Board. 2020a. *Carbon Monoxide & Health.* Available: https://ww2.arb.ca.gov/resources/carbon-monoxide-and-health. Accessed: January 6, 2020.

8 California Air Resources Board. 2010. *Estimate of Premature Deaths Associated with Fine Particle Pollution (PM2.5) in California Using a U.S. Environmental Protection Agency Methodology*. August 31. Available: https://ww3.arb.ca.gov/research/health/pm-mort/pm-report_2010.pdf. Accessed: February 18, 2020.

9 Bay Area Air Quality Management District. 2017a. *Final 2017 Clean Air Plan.* Adopted: April 19. Available: https://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en. Accessed: January 6, 2020.

10 U.S. Environmental Protection Agency. 2005. *Final Report: The National Morbidity, Mortality, and Air Pollution Study: Morbidity and Mortality from Air Pollution in the United States*. Last updated February 18, 2020. Available: https://cfpub.epa.gov/ncer_abstracts/index.cfm/fuseaction/display.highlight/abstract/2399/report/F. Accessed: January 6, 2020.

11 Bay Area Air Quality Management District. 2017a. *Final 2017 Clean Air Plan.* Adopted: April 19. Available: https://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en. Accessed: January 6, 2020.

12 U.S. Environmental Protection Agency. 2018b. *Particulate Matter (PM) Pollution*. Late updated: June 2018. Available: https://www.epa.gov/pm-pollution/health-and-environmental-effects-particulate-matter-pm. Accessed: January 6, 2020.

risks. For TACs that are known or suspected carcinogens, the California Air Resources Board (CARB) has consistently found that there are no levels or thresholds below which exposure is risk free. Individual TACs vary greatly in the risks they present. At a given level of exposure, one TAC may pose a hazard that is many times greater than another. In California, TACs are identified and their toxicity is studied by the Office of Environmental Health Hazard Assessment (OEHHA). The primary TACs of concern associated with the project are asbestos and diesel particulate matter (DPM).

Asbestos is the name given to several naturally occurring fibrous silicate minerals. Before the adverse health effects of asbestos were identified, asbestos was widely used as insulation and fireproofing in buildings, and it can still be found in some older buildings. It is also found in its natural state in rock or soil. The inhalation of asbestos fibers into the lungs can result in a variety of adverse health effects, including inflammation of the lungs, respiratory ailments (e.g., asbestosis, which is scarring of lung tissue that results in constricted breathing), and cancer (e.g., lung cancer and mesothelioma, which is cancer of the linings of the lungs and abdomen).

DPM is generated by diesel-fueled equipment and vehicles. Within the Bay Area, the Bay Area Air Quality Management District (BAAQMD) has found that of all controlled TACs, emissions of DPM are responsible for about 82 percent of the total ambient cancer risk.[13] Short-term exposure to DPM can cause acute irritation (e.g., eye, throat, and bronchial), neurophysiological symptoms (e.g., lightheadedness and nausea), and respiratory symptoms (e.g., cough and phlegm). The U.S. Environmental Protect Agency (EPA) has determined that diesel exhaust is "likely to be carcinogenic to humans by inhalation."[14]

Odors

Offensive odors can be unpleasant and lead to citizen complaints to local governments and air districts. According to CARB's *Air Quality and Land Use Handbook,*[15] land uses associated with odor complaints are typically sewage treatment plants, landfills, recycling facilities, manufacturing plants, and agricultural areas. CARB provides recommended screening distances for siting new receptors near existing odor sources.

4.2.2.2 Climate and Meteorology

Although the primary factors that determine air quality are the locations of air pollutant sources and the amount of pollutants emitted from those sources, meteorological conditions and topography are also important factors. Atmospheric conditions, such as wind speed, wind direction, and air temperature gradients, interact with the physical features of the landscape to determine the movement and dispersal of air pollutants. Unique geographic features define the 15 air basins throughout the state, each with its own distinctive regional climate. The air quality study area is located on the San Francisco Peninsula in the SFBAAB.

---

13 Bay Area Air Quality Management District. 2017a. *Final 2017 Clean Air Plan.* Adopted: April 19. Available: https://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en. Accessed: January 6, 2020.

14 U.S. Environmental Protection Agency. 2003. *Diesel Engine Exhaust.* CASRN N.A. February 28. Available: https://cfpub.epa.gov/ncea/iris/iris_documents/documents/subst/0642_summary.pdf#nameddest=woe. Accessed: January 6, 2020.

15 California Air Resources Board. 2005. *Air Quality and Land Use Handbook: A Community Health Perspective.* April. Available: https://ww3.arb.ca.gov/ch/handbook.pdf. Accessed: January 6, 2020.

The Peninsula subregion extends from northwest of San José to the Golden Gate Bridge. The Santa Cruz Mountains run along the center of the peninsula, with elevations above 2,000 feet at the southern end but decreasing to 500 feet in South San Francisco. Coastal towns experience a high incidence of cool, foggy weather in the summer. San Francisco lies at the northern end of the peninsula. Because most of South San Francisco's topography is below 200 feet, marine air can flow easily across most of the City, making its climate cool and windy. Cities in the southeastern peninsula experience warmer temperatures and fewer foggy days because the marine layer is blocked by the ridgeline to the west.

The regional climate within the SFBAAB is considered semi-arid, characterized by warm summers, mild winters, infrequent seasonal rainfall, moderate onshore breezes in the daytime, and moderate humidity. A wide range of meteorological and emissions-related sources, such as the dense population centers, heavy vehicular traffic, and industrial activity, influence air quality in the SFBAAB.

Annual average wind speeds range from 5 to 10 mph throughout the peninsula. The tendency is for the higher wind speeds to be found along the western coast. However, winds on the east side of the peninsula can also be high in certain locales because low-lying areas in the mountains, at San Bruno Gap and Crystal Springs Gap, commonly allow the marine layer to pass across the peninsula.

The prevailing winds are westerly along the peninsula's western coastline. Individual sites can show significant differences, however. For example, Fort Funston in western San Francisco County shows a southwesterly wind pattern, while Pillar Point in San Mateo County to the south shows a northwesterly wind pattern. Sites on the east side of the mountains also show a westerly pattern, although their wind patterns are influenced by local topographic features. That is, an increase in elevation of a few hundred feet will induce flows around that feature instead of over it during stable atmospheric conditions. This can change the wind pattern by as much as 90 degrees over short distances. On mornings without a strong pressure gradient, areas on the east side of the peninsula often experience easterly flows in the surface layer. These are induced by upslope flows on the east-facing slopes and the bay breeze. The bay breeze is rarely seen after noon because the stronger sea breeze dominates the flow pattern.

On the peninsula, there are two important gaps in the Santa Cruz Mountains. The larger of the two is San Bruno Gap, extending from Fort Funston on the ocean side to San Francisco International Airport on the bay side. Because the gap is oriented in the same northwest-to-southeast direction as the prevailing winds, and because elevations along the gap are under 200 feet, marine air is easily able to penetrate into the bay.

The other gap in the Santa Cruz Mountains is Crystal Springs Gap, located along State Route 92 between Half Moon Bay and San Carlos. The low point is 900 feet, but elevations reach 1,500 feet north and south of the gap. As the sea breeze strengthens on summer afternoons, the gap permits maritime air to pass across the mountains. Its cooling effect is commonly seen from San Mateo to Redwood City.

Rainfall totals on the east side of the peninsula are somewhat lower than those on the west side, with South San Francisco reporting an average of 20.8 inches per year. On the west side, Half Moon Bay reports 25 inches per year. Areas in the Santa Cruz Mountains report significantly higher rainfall totals, especially west of the ridge line, because of induced condensation from orographic lifting, proximity to a moisture source, and fog drip.

Air pollution potential is lower in the northern portion of the peninsula because winds are generally fast enough to carry pollutants away before they can accumulate.

The average maximum daily summertime and wintertime temperatures in South San Francisco are in the low 70s and mid-50s, respectively. The average minimum daily summertime and wintertime temperatures in South San Francisco are in the mid-50s and low 40s, respectively.[16]

4.2.2.3 Existing Air Quality Conditions

Ambient Criteria Pollutant Concentrations

A number of ambient air quality monitoring stations are located in the SFBAAB to monitor progress toward attainment of the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS). The NAAQS and CAAQS are discussed further under *Regulatory Framework*. There are no monitoring stations in the City. The nearest monitoring station is the San Francisco-Arkansas Street monitoring station, approximately 7.2 miles north of the project site.

Table 4.2-1 summarizes data regarding criteria air pollutant levels at the San Francisco-Arkansas Street monitoring station between 2016 and 2018, the last 3 years with complete data. Table 4.2-1 shows that the San Francisco-Arkansas Street monitoring station recorded violations of the federal PM2.5 standard in 2017 and 2018 and state PM10 standard in 2017. Federal and state standards for other pollutants were not exceeded. Violations of the ambient air quality standards for PM indicate that certain individuals, if exposed to this pollutant, may experience health effects, such as increased incidences of cardiovascular and respiratory ailments.

Table 4.2-1. Ambient Air Quality Data at the San Francisco-Arkansas Monitoring Station (2016–2018)

Pollutant Standards	2016	2017	2018
Ozone (O_3)			
Maximum 1-hour concentration (ppm)	0.070	0.087	0.065
Maximum 8-hour concentration (ppm)	0.057	0.054	0.049
Number of days standard exceeded[a]			
CAAQS 1-hour standard (> 0.09 ppm)	0	0	0
CAAQS 8-hour standard (> 0.070 ppm)	0	0	0
NAAQS 8-hour standard (> 0.070 ppm)	0	0	0
Carbon Monoxide (CO)			
Maximum 8-hour concentration (ppm)	1.1	1.4	1.6
Maximum 1-hour concentration (ppm)	1.7	2.5	1.9
Number of days standard exceeded[a]			
NAAQS 8-hour standard (≥ 9 ppm)	0	0	0
CAAQS 8-hour standard (≥ 9.0 ppm)	0	0	0
NAAQS 1-hour standard (≥ 35 ppm)	0	0	0
CAAQS 1-hour standard (≥ 20 ppm)	0	0	0

[16] Weather Channel. 2020. *South San Francisco, CA, Monthly Weather*. Available: https://weather.com/weather/monthly/l/58e3526471350bc59bfa920168f6bd001aa43f998b0af74fe60bea4e7ce80a23. Accessed: January 6, 2020.

Pollutant Standards	2016	2017	2018
Nitrogen Dioxide (NO_2)			
State maximum 1-hour concentration (ppb)	58	73	68
State second-highest 1-hour concentration (ppb)	57	66	65
Annual average concentration (ppb)	10	11	11
Number of days standard exceeded[a]			
CAAQS 1-hour (180 ppb)	0	0	0
Particulate Matter (PM10)			
National[b] maximum 24-hour concentration (μg/m^3)	35.7	75.9	40.9
National[b] second-highest 24-hour concentration (μg/m^3)	27.9	52.7	35.7
State[c] maximum 24-hour concentration (μg/m^3)	29.0	77.0	43.0
State[c] second-highest 24-hour concentration (μg/m^3)	28.0	53.0	37.0
National annual average concentration (μg/m^3)	8.8	11.0	10.0
State annual average concentration (μg/m^3)[d]	17	22	22
Measured number of days standard exceeded[a]			
NAAQS 24-hour standard (> 150 μg/m^3)	0	0	0
CAAQS 24-hour standard (> 50 μg/m^3)	0	2	0
Fine Particulate Matter (PM2.5)			
National[e] maximum 24-hour concentration (μg/m^3)	19.6	49.9	177.4
National[e] second-highest 24-hour concentration (μg/m^3)	19.3	49.7	145.4
State[f] maximum 24-hour concentration (μg/m^3)	19.6	49.9	177.4
State[f] second-highest 24-hour concentration (μg/m^3)	19.3	49.7	145.4
National annual average concentration (μg/m^3)	7.5	9.7	11.6
State annual average concentration (μg/m^3)	*	9.7	11.6
Measured number of days standard exceeded[a]			
NAAQS 24-hour standard (> 35 μg/m^3)	0	7	14

Sources:

California Air Resources Board. 2020b. *iADAM: Air Quality Data Statistics – Top 4 Summary* (2016–2018, San Francisco County, 10 Arkansas Street). Available: https://www.arb.ca.gov/adam/topfour/topfourdisplay.php. Accessed: January 6, 2020.

U.S. Environmental Protection Agency. 2018c. *Outdoor Air Quality Data. Monitor Values Reports* (Carbon Monoxide, 2016–2018, San Francisco County). Last updated: July 31. Available: https://www.epa.gov/outdoor-air-quality-data/monitor-values-report. Accessed: January 6, 2020.

Notes:

ppb = parts per billion;
ppm = parts per million
NAAQS = National Ambient Air Quality Standards
CAAQS = California Ambient Air Quality Standards
μg/m^3 = micrograms per cubic meter
mg/m^3 = milligrams per cubic meter
* = insufficient data available to determine the value

[a] An exceedance is not necessarily related to a violation of the standard.
[b] National statistics are based on standard-conditions data. In addition, national statistics are based on samplers, using federal reference or equivalent methods.
[c] State statistics are based on approved local samplers and local-conditions data.
[d] State criteria for ensuring that data are adequately complete for calculating valid annual averages are more stringent than the national criteria.
[e] National statistics are based on samplers, using federal reference or equivalent methods.
f State statistics are based on local approved samplers.

Existing TAC Sources and Health Risks

Existing TAC sources within 1,000 feet of the project site include stationary sources and the Caltrain right-of-way. Stationary sources include generators owned by AstraZeneca Pharmaceuticals, Alexandria Real Estate Equities, Health Plan of San Mateo, Life Technologies, the City of South San Francisco Water Quality Plant, Boston Properties, 425 Eccles, HCP Oyster Point, and Five Prime Therapeutics.[17] The Caltrain right-of-way is approximately 800 feet northwest of the project site.

Regional Attainment Status

Local monitoring data are used to designate areas as nonattainment, maintenance, attainment, or unclassified areas for the ambient air quality standards. The four designations are defined below. Table 4.2-2 summarizes the attainment status of San Mateo County.

- Nonattainment—Assigned to areas where monitored pollutant concentrations consistently violate the standard in question.
- Maintenance—Assigned to areas where monitored pollutant concentrations exceeded the standard in question in the past but are no longer in violation of that standard.
- Attainment—Assigned to areas where pollutant concentrations meet the standard in question over a designated period of time.
- Unclassified—Assigned to areas where data are insufficient for determining whether a pollutant is violating the standard in question.

Table 4.2-2. Federal and State Ambient Air Quality Attainment Status for San Mateo County

Criteria Pollutant	Federal Designation	State Designation
Ozone (8-hour)	Marginal nonattainment	Nonattainment
Carbon monoxide (CO)	Attainment	Attainment
Particulate matter (PM10)	Attainment	Nonattainment
Fine particulate matter (PM2.5)	Attainment	Nonattainment
Nitrogen dioxide (NO_2)	Attainment	Attainment
Sulfur dioxide (SO_2)	Attainment	Attainment
Lead	Attainment	Attainment
Sulfates	(no federal standard)	Attainment
Hydrogen sulfide	(no federal standard)	Unclassified
Visibility-reducing particles	(no federal standard)	Unclassified

Source:

California Air Resources Board. 2019. *Area Designation Maps/State and National* (San Mateo County). Last reviewed: October 24, 2019. Available: https://ww3.arb.ca.gov/desig/adm/adm.htm. Accessed: January 6, 2020.

U.S. Environmental Protection Agency. 2019. December 31. *Nonattainment Areas for Criteria Pollutants (Greenbook)* (San Mateo County). Available: https://www.epa.gov/green-book. Accessed: January 6, 2020.

[17] Bay Area Air Quality Management District. 2018. *Permitted Stationary Source Risk and Hazards*. Available: https://baaqmd.maps.arcgis.com/apps/webappviewer/index.html?id=2387ae674013413f987b1071715daa65. Accessed: June 8, 2020.

4.2.2.4 Locations of Sensitive Receptors

Sensitive land uses are defined as locations where human populations, especially children, seniors, and sick persons, are located and where there is reasonable expectation of continuous human exposure according to the averaging period for the air quality standards (i.e., 24 hours, 8 hours). Typical sensitive receptors are residences, hospitals, schools, and parks.

The project site includes a six-story, approximately 170,235-square-foot office building at 701 Gateway Boulevard and surface parking lots. The project site is in the Gateway Campus, an area with primarily commercial and office uses. The project site is bounded by a commercial and office building (901 Gateway Boulevard) and a surface parking lot to the north, Gateway Boulevard to the east, a surface parking lot to the south, and commercial and office buildings to the west.

There are no residential or recreational sensitive receptors within 1,000 feet of the project site. The nearest residence is over 1,200 feet (0.23 mile) from the project site, and Oyster Point Park is approximately 3,100 feet (0.70 mile) northeast of the project site. There are no hospitals or schools within 0.25 mile of the project site. The nearest school is Martin Elementary School, approximately 0.8 mile west. Two day-care centers are within 0.25 mile of the project site: the One and Two Tower Place Project and the Gateway Child Development Center Peninsula. The One and Two Tower Place Project day care center is approximately 0.25 mile north, the Gateway Child Development Center Peninsula is approximately 0.19 mile (1,000 feet) from the main project construction areas. However, the Gateway Child Development Center Peninsula is approximately 0.13 mile (670 feet) from the nearest project construction area, which would be at the southern terminus of the site and include repaving and curb work, as well as some landscaping activities.

4.2.3 Regulatory Framework

The federal CAA and its subsequent amendments form the basis for the nation's air pollution control effort. EPA is responsible for implementing most aspects of the CAA. A key element of the CAA is the NAAQS for criteria pollutants. The CAA delegates enforcement of the NAAQS to the states. In California, CARB is responsible for enforcing air pollution regulations and ensuring the NAAQS and CAAQS are met. CARB, in turn, delegates regulatory authority for stationary sources and other air quality management responsibilities to local air agencies. BAAQMD is the local air agency for the project area.

4.2.3.1 Federal

Clean Air Act and National Ambient Air Quality Standards

The CAA was first enacted in 1963 but amended numerous times in subsequent years (1965, 1967, 1970, 1977, and 1990). The CAA establishes federal air quality standards, known as the NAAQS, for six criteria pollutants and specifies future dates for achieving compliance with the standards. The CAA also mandates that states submit and implement a State Implementation Plan (SIP) for local areas not meeting the standards. The plans must include pollution control measures that demonstrate how the standards will be met.

The 1990 amendments to the CAA identify specific emissions reduction goals for areas not meeting the NAAQS. These amendments require both a demonstration of reasonable further progress toward attainment and incorporation of additional sanctions for failure to attain or meet interim milestones. Table 4.2-3 shows the NAAQS currently in effect for each criteria pollutant as well as the CAAQS (discussed further below).

Table 4.2-3. Federal and State Ambient Air Quality Standards

			National Standards[a]	
Criteria Pollutant	**Average Time**	**California Standards**	**Primary**	**Secondary**
Ozone	1 hour	0.09 ppm	None[b]	None[b]
	8 hours	0.070 ppm	0.070 ppm	0.070 ppm
Carbon Monoxide	8 hours	9.0 ppm	9 ppm	None
	1 hour	20 ppm	35 ppm	None
Particulate Matter (PM10)	24 hours	50 μg/m^3	150 μg/m^3	150 μg/m^3
	Annual mean	20 μg/m^3	None	None
Fine Particulate Matter (PM2.5)	24 hours	None	35 μg/m^3	35 μg/m^3
	Annual mean	12 μg/m^3	12.0 μg/m^3	15 μg/m^3
Nitrogen Dioxide (NO_2)	Annual mean	0.030 ppm	0.053 ppm	0.053 ppm
	1 hour	0.18 ppm	0.100 ppm	None
Sulfur Dioxide (SO_2)[c]	Annual mean	None	0.030 ppm	None
	24 hours	0.04 ppm	0.14 ppm	None
	3 hours	None	None	0.5 ppm
	1 hour	0.25 ppm	0.075 ppm	None
Lead	30-day average	1.5 μg/m^3	None	None
	Calendar quarter	None	1.5 μg/m^3	1.5 μg/m^3
	3-month average	None	0.15 μg/m^3	0.15 μg/m^3
Sulfates	24 hours	25 μg/m^3	None	None
Visibility-reducing Particles	8 hours	—[d]	None	None
Hydrogen Sulfide	1 hour	0.03 ppm	None	None
Vinyl Chloride	24 hours	0.01 ppm	None	None

Source: California Air Resources Board. 2016. *Ambient Air Quality Standards.* May 4. Available: https://ww3.arb.ca.gov/research/aaqs/aaqs2.pdf. Accessed: January 6, 2020.

Notes:

ppm = parts per million

μg/m^3 = micrograms per cubic meter

[a] National standards are divided into primary and secondary standards. Primary standards are intended to protect public health, whereas secondary standards are intended to protect public welfare and the environment.

[b] The federal 1-hour standard of 12 parts per hundred million was in effect from 1979 through June 15, 2005. The revoked standard is referenced because it was employed for such a long period and is a benchmark for State Implementation Plans.

[c] The annual and 24-hour National Ambient Air Quality Standards for SO_2 apply for only 1 year after designation of the new 1-hour standard to those areas that were previously in nonattainment for the 24-hour and annual National Ambient Air Quality Standards.

[d] California Ambient Air Quality Standards for visibility-reducing particles are defined by an extinction coefficient of 0.23 per kilometer (visibility of 10 miles or more due to particles when relative humidity is less than 70 percent).

Non-road Diesel Rule

EPA has established a series of increasingly strict emission standards for new off-road diesel equipment, on-road diesel trucks, and locomotives. New equipment, including heavy-duty trucks and off-road construction equipment, is required to comply with the emission standards.

Corporate Average Fuel Economy Standards

The Corporate Average Fuel Economy Standards (CAFÉ standards) were first enacted in 1975 to improve the average fuel economy of cars and light-duty trucks. The National Highway Traffic Safety Administrative (NHTSA) sets the CAFÉ standards, which are regularly updated to require additional improvements in fuel economy. The standards were last updated in October 2012; the updates apply to new passenger cars, light-duty trucks, and medium-duty passenger vehicles and cover model years 2017 through 2025, with a goal of 54.5 miles per gallon by 2025. However, on August 2, 2018, NHTSA and EPA proposed an amendment to the fuel efficiency standards for passenger cars and light trucks and established new standards for model years 2021 through 2026, thereby maintaining the current 2020 standards through 2026 (Safer Affordable Fuel-Efficient [SAFE] Vehicles Rule). On September 19, 2019, EPA and NHTSA issued a final action on the One National Program Rule, which is considered Part 1 of the SAFE Vehicles Rule and a precursor to the proposed fuel efficiency standards. The One National Program Rule enables EPA and NHTSA to provide uniform nationwide fuel economy and greenhouse gas (GHG) standards by 1) clarifying that federal law preempts state and local tailpipe GHG standards, 2) affirming NHTSA's statutory authority to set nationally applicable fuel economy standards, and 3) withdrawing California's CAA preemption waiver to set state-specific standards. EPA and NHTSA published their decision to withdraw California's waiver and finalized regulatory text related to the preemption on September 27, 2019 (84 *Federal Register* 51310). The agencies also announced that they will later publish the second part of the SAFE Vehicles Rule (i.e., the standards).

California, 22 other states, the District of Columbia, and two cities filed suit against the proposed One National Program Rule on September 20, 2019 (*California et al. v. United States Department of Transportation et al.,* 1:19-cv-02826, U.S. District Court for the District of Columbia). The lawsuit requests a "permanent injunction prohibiting defendants from implementing or relying on the preemption regulation" but does not stay its implementation during legal deliberations. Part 1 of the SAFE Vehicles Rule went into effect on November 26, 2019, and Part 2 went into effect on March 30, 2020. The rule decreases the stringency of the CAFÉ standards, calling for fuel efficiency increases of 1.5 percent each year through model year 2026 compared with the 5 percent annual increase under the 2012 standards.

4.2.3.3 State

California Clean Air Act and California Ambient Air Quality Standards

In 1988, the state legislature adopted the California CAA, which established a statewide air pollution control program. The California CAA requires all air districts in the state to endeavor to meet the CAAQS by the earliest practical date. Unlike the CAA, the California CAA does not set precise attainment deadlines. Instead, the California CAA establishes increasingly stringent requirements for areas that require more time to achieve the standards. The CAAQS are generally more stringent than the NAAQS and incorporate additional standards for sulfates, hydrogen sulfide, visibility-reducing particles, and vinyl chloride. The CAAQS and NAAQS are shown in Table 4.2-3.

CARB and local air districts bear responsibility for meeting the CAAQS, which are to be achieved through district-level air quality management plans incorporated into the SIP. In California, EPA has delegated authority to prepare SIPs to CARB, which, in turn, has delegated that authority to individual air districts. CARB traditionally has established state air quality standards, maintaining oversight authority in air quality planning, developing programs for reducing emissions from motor vehicles, developing air emission inventories, collecting air quality and meteorological data, and approving SIPs.

The California CAA substantially adds to the authority and responsibilities of air districts. The California CAA designates air districts as lead air quality planning agencies, requires air districts to prepare air quality plans, and grants air districts authority to implement transportation control measures. The California CAA also emphasizes the control of "indirect and area-wide sources" of air pollutant emissions. The California CAA gives local air pollution control districts explicit authority to regulate indirect sources of air pollution.

Statewide Truck and Bus Regulation

Originally adopted in 2005, the on-road truck and bus regulation requires heavy trucks to be retrofitted with PM filters. The regulation applies to privately and federally owned diesel-fueled trucks with a gross vehicle weight rating greater than 14,000 pounds. Compliance with the regulation can be reached through one of two paths: (1) vehicle retrofits according to engine year or (2) a phase-in schedule. The compliance paths ensure that nearly all trucks and buses will have model year 2010 engines or newer by January 2023.

State Tailpipe Emission Standards

Like EPA at the federal level, CARB has established a series of increasingly strict emission standards for new off-road diesel equipment and on-road diesel trucks operating in California. New equipment used to construct the project would be required to comply with the standards.

Carl Moyer Program

The Carl Moyer Memorial Air Quality Standards Attainment Program (Carl Moyer Program) is a voluntary program that offers grants to owners of heavy-duty vehicles and equipment. The program is a partnership between CARB and the local air districts throughout the state to reduce air pollution emissions from heavy-duty engines. Locally, the air districts administer the Carl Moyer Program.

Toxic Air Contaminant Regulation

California regulates TACs primarily through the Toxic Air Contaminant Identification and Control Act (Tanner Act) and the Air Toxics "Hot Spots" Information and Assessment Act of 1987 ("Hot Spots" Act). In the early 1980s, CARB established a statewide comprehensive air toxics program to reduce exposure to air toxics. The Tanner Act created California's program to reduce exposure to air toxics. The "Hot Spots" Act supplements the Tanner Act by requiring a statewide air toxics inventory, notification of people exposed to a significant health risk, and facility plans to reduce these risks.

CARB has identified DPM as a TAC and approved a comprehensive Diesel Risk Reduction Plan to reduce emissions from both new and existing diesel-fueled engines and vehicles. The goal of the plan is to reduce DPM emissions and the associated health risk by 75 percent by 2010 and by 85 percent by 2020. The plan identifies 14 measures that CARB will implement over the next several years. The project would be required to comply with any applicable diesel control measures from the Diesel Risk Reduction Plan.[18]

4.2.3.4 Regional

Bay Area Air Quality Management District

At the local level, responsibilities of air quality districts include overseeing stationary-source emissions, approving permits, maintaining emissions inventories, maintaining air quality stations, overseeing agricultural burning permits, and reviewing air quality–related sections of environmental documents required by the California Environmental Quality Act (CEQA). The air quality districts are also responsible for establishing and enforcing local air quality rules and regulations that address the requirements of federal and state air quality laws and for ensuring that the NAAQS and CAAQS are met.

The project falls under the jurisdiction of BAAQMD. BAAQMD has local air quality jurisdiction over projects in the SFBAAB, including San Mateo County. BAAQMD developed advisory emission thresholds to assist CEQA lead agencies in determining the level of significance of a project's emissions, as outlined in the agency's California Environmental Quality Act Air Quality Guidelines (CEQA Guidelines).[19] BAAQMD has also adopted air quality plans to improve air quality, protect public health, and protect the climate. These include the 2017 Clean Air Plan: Spare the Air, Cool the Climate.[20]

The 2017 Clean Air Plan was adopted by BAAQMD on April 19, 2017. The 2017 Clean Air Plan updates the prior 2010 Bay Area ozone plan and outlines feasible measures to reduce ozone; provides a control strategy to reduce particulate matter, air toxics, and GHGs in a single, integrated plan; and establishes emission control measures to be adopted or implemented. The 2017 Clean Air Plan contains the primary goals listed below.

- Protect Air Quality and Health at the Regional and Local Scale: Attain all state and national air quality standards, and eliminate disparities among Bay Area communities in cancer health risk from TACs.
- Protect the Climate: Reduce Bay Area GHG emissions to 40 percent below 1990 levels by 2030 and 80 percent below 1990 levels by 2050.

The 2017 Clean Air Plan is the most current applicable air quality plan for the air basin. Consistency with this plan is the basis for determining whether the project would conflict with or obstruct implementation of an air quality plan. The proposed project's consistency with Senate Bill (SB) 32, which outlines the State's GHG reduction goals (i.e., achieving 1990 emissions levels by 2020 and

---

[18] California Air Resources Board. 2000. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engine and Vehicles.* October. Available: https://ww3.arb.ca.gov/diesel/documents/rrpfinal.pdf. Accessed: January 6, 2020.

[19] Bay Area Air Quality Management District. 2017b. *California Environmental Quality Act, Air Quality Guidelines.* May. Available: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed: January 6, 2020.

[20] Bay Area Air Quality Management District. 2017a. *Final 2017 Clean Air Plan.* Adopted: April 19. Available: https://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en. Accessed: January 6, 2020.

a level 40 percent below 1990 emissions levels by 2030), and Executive Order (EO) S-3-05, which further aims to reduce California's GHG emissions to 80 percent below the 1990 levels by 2050, is evaluated in Section 4.7, *Greenhouse Gas Emissions*.

In addition to air quality plans, BAAQMD also adopts rules and regulations to improve existing and future air quality. The project may be subject to the following district rules:

- Regulation 2, Rule 2 (New Source Review)—This regulation contains requirements for best available control technology and emission offsets.
- Regulation 2, Rule 5 (New Source Review of Toxic Air Contaminates)—This regulation outlines guidance for evaluating TAC emissions and their potential health risks.
- Regulation 6, Rule 1 (Particulate Matter)—This regulation restricts emissions of PM darker than No. 1 on the Ringlemann Chart to less than 3 minutes in any 1 hour.
- Regulation 7 (Odorous Substances)—This regulation establishes general odor limitations on odorous substances and specific emission limitations on certain odorous compounds.
- Regulation 8, Rule 3 (Architectural Coatings)—This regulation limits the quantity of ROG in architectural coatings.
- Regulation 9, Rule 6 (Nitrogen Oxides Emissions from Natural Gas–Fired Boilers and Water Heaters)—This regulation limits emissions of NO_X generated by natural gas–fired boilers.
- Regulation 9, Rule 8 (Stationary Internal Combustion Engines)—This regulation limits emissions of NO_X and CO from stationary internal combustion engines of more than 50 horsepower.
- Regulation 11, Rule 2 (Hazardous Pollutants – Asbestos Demolition, Renovation, and Manufacturing)—This regulation, which incorporates EPA's asbestos-related National Emissions Standards for Hazardous Air Pollutants, controls emissions of asbestos to the atmosphere during demolition, renovation, and transport.

4.2.3.5 Local

South San Francisco General Plan

The 1999 South San Francisco General Plan (General Plan) provides a vision for long-range physical and economic development of the City, provides strategies and specific implementing actions, and establishes a basis for judging whether specific development proposals and public projects are consistent with the City of South San Francisco's (City's) plans and policy standards. The General Plan contains an Open Space and Conservation Element, which outlines policies related to biological resources, water quality, air quality, GHG emissions, and historic and cultural resources. The General Plan includes the following policies that are applicable to air quality:

- Guiding Principle 7.3-G-1: Continue to work toward improving air quality and meeting all national and state ambient air quality standards by reducing the generation of air pollutants both from stationary and mobile sources, where feasible.
- Guiding Principle 7.3-G-4: Encourage land use and transportation strategies that promote use of alternatives to the automobile for transportation, including bicycling, bus transit, and carpooling.

- Guiding Principle 7.3-G-5: Promote clean and alternative fuel combustion in mobile equipment and vehicles.
- Guiding Principle 7.3-G-6: Minimize conflicts between sensitive receptors and emissions generators by distancing them from one another.
- Implementing Policy 7.3-I-1: Cooperate with BAAQMD to achieve emissions reductions for nonattainment pollutants and their precursors, including CO, ozone, and PM10, by implementation of air pollution control measures, as required by state and federal statutes.
- Implementing Policy 7.3-I-2: Use the City's development review process and CEQA regulations to evaluate and mitigate the local and cumulative effects of new development on air quality and GHG emissions.
- Implementing Policy 7.3-I-3: Adopt the standard construction dust abatement measures included in BAAQMD's CEQA Guidelines.
- Implementing Policy 7.3-I-9: Promote land uses that facilitate alternative transit use, including high-density housing, mixed uses, and affordable housing served by alternative transit infrastructure.
- Implementing Policy 7.3-I-13: Encourage efficient, clean energy and fuel use through collaborative programs, award programs, and incentives while removing barriers to the expansion of alternative fuel facilities and infrastructure.
- Implementing Policy 7.3-I-14: Ensure that design guidelines and standards support operation of alternative fuel facilities, vehicles, and equipment.

4.2.4 Impacts and Mitigation Measures

4.2.4.1 Significance Criteria

Based on Appendix G of the CEQA Guidelines, the proposed project would have an air quality impact if it would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Result in a cumulatively considerable net increase in any criteria pollutant for which the project region is classified as nonattainment under an applicable federal or state ambient air quality standard;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

As discussed above, the pollutants that would be generated by the proposed project are associated with some form of health risk (e.g., asthma, lower respiratory problems). Regional pollutants can be transported over long distances and affect ambient air quality far from the emissions source. Localized pollutants affect ambient air quality near the emissions source. As discussed above, the primary pollutants of concern generated by the project are ozone precursors (ROG and NO_X), CO, PM, and TACs (including DPM and asbestos). The emission thresholds that can be used to evaluate the significance level of regional and localized pollutants are discussed in the subsections that follow. Thresholds and guidance for evaluating potential odors associated with the project area are also presented.

Regional Project-Generated Criteria Pollutant Emissions (Ozone Precursors and Regional Particulate Matter)

This analysis evaluates the impacts of regional emissions generated by the project. It uses a two-tiered approach that considers guidance recommended by BAAQMD in its CEQA Guidelines.[21] First, this analysis considers whether the project would conflict with the most recent air quality plan.[22] Specifically, the impact analysis evaluates whether the project supports the primary goals of the 2017 Clean Air Plan, including applicable control measures from the plan, and whether it would disrupt or hinder implementation of any control measure from the plan.

Second, calculated regional criteria pollutant emissions are compared to BAAQMD's project-level thresholds. BAAQMD's thresholds are summarized in Table 4.2-4 and recommended by the air district to evaluate the significance of a project's regional criteria pollutant emissions.[23,24] According to BAAQMD, projects with emissions in excess of the thresholds shown in Table 4.2-4 would be expected to have a significant cumulative impact on regional air quality because an exceedance of the thresholds is anticipated to contribute to CAAQS and NAAQS violations.

Table 4.2-4. BAAQMD Project-Level Regional Criteria Pollutant Emission Thresholds

Analysis	Thresholds
Regional criteria pollutants (construction)	Reactive organic gases: 54 pounds/day Nitrogen oxides: 54 pounds/day Particulate matter: 82 pounds/day (exhaust only); compliance with best management practices (fugitive dust) Fine particulate matter: 54 pounds/day (exhaust only); compliance with best management practices (fugitive dust)
Regional criteria pollutants (operations)	Reactive organic gases: Same as construction Nitrogen oxides: Same as construction Particulate matter: 82 pounds/day Fine particulate matter: 54 pounds/day

Source: Bay Area Air Quality Management District. 2017b. *California Environmental Quality Act, Air Quality Guidelines.* May. Available: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed: January 6, 2020.

---

21 Bay Area Air Quality Management District. 2017b. *California Environmental Quality Act, Air Quality Guidelines.* May. Available: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed: January 6, 2020.

22 Bay Area Air Quality Management District. 2017a. *Final 2017 Clean Air Plan.* Adopted: April 19. Available: https://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en. Accessed: January 6, 2020.

23 Bay Area Air Quality Management District. 2017b. *California Environmental Quality Act, Air Quality Guidelines.* May. Available: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed: January 6, 2020.

24 The proposed project would include office and research-and-development uses. Although the proposed office and retail uses (approximately 78,700 square feet and 12,100 square feet, respectively) would be below BAAQMD's screening-level size for a general office building and various commercial land uses, there are no applicable screening criteria for the proposed project's research-and-development uses (approximately 118,000 square feet). In addition, the proposed project would include demolition activities. As such, per BAAQMD, construction-related emissions of criteria pollutants should be quantified and compared to the construction-related thresholds shown in Table 4.2-5.

Adverse health effects induced by regional criteria pollutant emissions generated by the proposed project (ozone precursors and PM) would be highly dependent on a multitude of interconnected variables (e.g., cumulative concentrations, local meteorology and atmospheric conditions, the number and character of exposed individuals [e.g., age, gender]). For these reasons, ozone precursors (ROG and NO_X) contribute to the formation of ground-borne ozone on a regional scale. Emissions of ROG and NO_X generated in one area may not equate to a specific ozone concentration in that same area. Similarly, some types of particulate pollution may be transported over long distances or formed through atmospheric reactions. As such, the magnitudes and locations of specific health effects from exposure to increased ozone or regional PM concentrations are the product of emissions generated by numerous sources throughout a region as opposed to a single individual project. Moreover, exposure to regional air pollution does not guarantee that an individual will experience an adverse health effect; there are large individual differences in the intensity of symptomatic responses to an air pollutant. These differences are influenced, in part, by the underlying health condition of an individual, which cannot be known. Nonetheless, emissions generated by the proposed project could increase photochemical reactions and the formation of tropospheric ozone and secondary PM, which, at certain concentrations, could lead to increased incidences of specific health consequences, such as various respiratory and cardiovascular ailments. As discussed previously, air districts develop region-specific CEQA thresholds of significance in consideration of existing air quality concentrations and attainment designations under the NAAQS and CAAQS. The NAAQS and CAAQS are informed by a wide range of scientific evidence that demonstrates there are known safe concentrations of criteria pollutants. Accordingly, the proposed project would expose receptors to substantial regional pollution if any of the thresholds summarized in Tables 4.2-4 are exceeded.

Localized Project-Generated Criteria Pollutant Emissions (Carbon Monoxide and Particulate Matter) and Air Toxics (Diesel Particulate Matter)

Localized pollutants generated by a project are deposited near the emissions source, potentially affecting the population near that source. Because these pollutants dissipate with distance, emissions from individual projects can result in direct and material health impacts on adjacent sensitive receptors. The localized pollutants of concern that would be generated by the project are CO, PM, and DPM. The applicable thresholds for each pollutant are described below.

Carbon Monoxide

Heavy traffic congestion can contribute to high levels of CO. Individuals who are exposed to such “hot spots” may have a greater likelihood of developing adverse health effects. BAAQMD has adopted screening criteria that provide a conservative indication of whether project-generated traffic would result in a CO hot spot. If the screening criteria are not met, a quantitative analysis, through site-specific dispersion modeling of project-related CO concentrations, is not necessary. The project would not result in localized violations of the CAAQS for CO. BAAQMD’s CO screening criteria are summarized below.[25]

[25] Bay Area Air Quality Management District. 2017b. *California Environmental Quality Act, Air Quality Guidelines.* May. Available: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed: January 6, 2020.

1. The project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour.
2. The project traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., a tunnel, parking garage, bridge underpass, natural or urban street canyon, below-grade roadway).
3. The project is consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, a regional transportation plan, and local congestion management agency plans.

BAAQMD does not consider construction-generated CO to be a significant pollutant of concern because construction activities typically do not generate substantial quantities of this pollutant.[26]

Particulate Matter

BAAQMD adopted an incremental concentration-based PM2.5 significance threshold in which a “substantial” contribution at the project level for an individual source is defined as total (i.e., exhaust and fugitive) PM2.5 concentrations exceeding 0.3 $\mu g/m^3$. In addition, BAAQMD considers projects to have a cumulatively considerable PM2.5 impact if sensitive receptors are exposed to PM2.5 concentrations from local sources within 1,000 feet that exceed 0.8 $\mu g/m^3$, including existing sources, project-related sources, and reasonably foreseeable future sources.[27]

BAAQMD has not established PM10 thresholds of significance. BAAQMD’s PM2.5 thresholds apply to both new receptors and new sources. However, BAAQMD considers fugitive PM10 from earthmoving activities to be less than significant with applicable BAAQMD Basic Construction Mitigation Measures.

Diesel Particle Matter

DPM has been identified as a TAC. It is particularly concerning because long-term exposure can lead to cancer, birth defects, and damage to the brain and nervous systems. BAAQMD has adopted incremental cancer and hazard thresholds to evaluate receptor exposure to single sources of DPM emissions. The “substantial” DPM threshold defined by BAAQMD is exposure of a sensitive receptor to an individual emissions source that results in an excess cancer risk level of more than 10 in 1 million or a non-cancer (i.e., chronic or acute) hazard index (HI) greater than 1.0.[28] The air district also considers projects to have a cumulatively considerable DPM impact if they contribute to DPM emissions that, when combined with cumulative sources within 1,000 feet of sensitive receptors, result in excess cancer risk levels of more than 100 in 1 million or an HI greater than 10.0. BAAQMD considers projects to have a significant cumulative impact if they introduce new receptors at a location where the combined exposure level to all cumulative sources within 1,000 feet is in excess of cumulative thresholds.[29]

---

[26] Ibid.
[27] Ibid.
[28] Ibid.
[29] Ibid.

Odors

BAAQMD[30] and CARB[31] have identified several types of land uses as being commonly associated with odors, such as landfills, wastewater treatment facilities, and animal processing centers. BAAQMD's CEQA Guidelines publication recommends that project analyses identify the location of existing and planned odor sources and include policies to reduce potential odor impacts in the project area.

4.2.4.2 Approach to Analysis

Methods

Construction Emissions

Land uses that could be developed under the proposed project would generate construction-related emissions from mobile and stationary construction equipment exhaust, employee and haul truck vehicle exhaust, land clearing and material movement, paving, and the application of architectural coatings. Criteria pollutant emissions were estimated using the California Emissions Estimator Model (CalEEMod), version 2016.3.2. The construction schedule, equipment operating details, trip numbers and lengths, and material quantities were provided by the project sponsor. Daily construction emissions were estimated using these project-specific details. The construction modeling inputs and CalEEMod outputs are provided in Appendix B of this draft environmental impact report (EIR).

Diesel Particulate Matter Analysis

Diesel-powered construction equipment and the emergency generator during project operations would emit DPM that could expose nearby sensitive receptors to increased cancer and non-cancer risks. As noted above, the nearest sensitive receptors are located at the Gateway Child Development Center Peninsula, approximately 670 feet south of the project site. Given that the proposed project would introduce DPM emissions to an area near existing sensitive receptors, a human Health Risk Assessment (HRA) was performed using EPA's most recent dispersion model, AERMOD (version 191901); chronic risk assessment values presented by OEHHA; and other assumptions for model inputs from BAAQMD's *Air Toxics NSR Program Health Risk Assessment Guidelines*.[32] The HRA takes into account OEHHA's most recent guidance and calculation methods from the *Air Toxics Hot Spots Program Guidance Manual for the Preparation of Risk Assessments*.[33]

The HRA analyzes health risks to nearby sensitive receptors from construction activities and testing of an emergency diesel-powered generator during project operation. The human HRA consists of three parts: a DPM inventory, air dispersion modeling, and risk calculations. A description of each of these parts follows.

---

30 Ibid.

31 California Air Resources Board. 2005. *Air Quality and Land Use Handbook: A Community Health Perspective.* April. Available: https://ww3.arb.ca.gov/ch/handbook.pdf. Accessed: January 6, 2020.

32 Bay Area Air Quality Management District. 2016. Air Toxics NSR Program Health Risk Assessment Guidelines. December. Available: https://www.baaqmd.gov/~/media/files/planning-and-research/permit-modeling/hra_guidelines_12_7_2016_clean-pdf.pdf. Accessed: August 3, 2020.

33 Office of Environmental Health Hazard Assessment. 2015. Air Toxics Hot Spots Program Guidance Manual for the Preparation of Risk Assessments. Available: https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf. Accessed: August 3, 2020.

DPM Inventory

The DPM inventory includes mitigated emissions associated with short-term construction activity and emissions from testing of the emergency generator. The construction DPM inventory was assumed to be equal to the CalEEMod output results for diesel PM2.5 exhaust. The construction PM2.5 inventory was assumed to be equal to the CalEEMod output results for the sum of PM2.5 exhaust and fugitive dust. The operational DPM inventory is assumed to be equal to the CalEEMod output results for diesel PM2.5 exhaust from the generator.

Air Dispersion Modeling

The HRA uses EPA's AERMOD to model annual average DPM and PM2.5 concentrations at nearby receptors. Modeling inputs, including emissions rates (in grams of pollutant emitted per second) and source characteristics (e.g., release height, stack diameter, plume width), were based on guidance provided by OEHHA and BAAQMD. Meteorological data were obtained from CARB for the San Francisco International Airport, which is the nearest monitoring station, located approximately 1.5 miles south of the project site.

Construction equipment emissions were characterized as an area source (AREAPOLY) with a release height of 0.9 meters for fugitive dust emissions and 4.1 meters for all other emissions. One construction area source was modeled, which included the project site where construction is anticipated. Haul and vendor truck emissions were characterized as line/area sources (LINEAREA) with release heights of 0.9 meters for fugitive dust emissions and 3.4 meters for all other emissions. Emissions from off-road equipment were assumed to be generated throughout the construction footprint. Emissions from offsite trucks were modeled along 1,000-foot segments adjacent to the construction footprint along Gateway Boulevard and Oyster Point Boulevard.

The modeling of emissions from construction activities was based on the construction hours and days (7:00 a.m. to 5:00 p.m., five days per week[34]) during 2020 and 2021 described in Section 3.3.2.7 in Chapter 2, *Project Description*, of this draft EIR. To account for plume rise associated with mechanically generated construction emissions sources for the AERMOD run, the initial vertical dimension of the area source was modeled at 3.81 meters; for the line/area sources, it was modeled at 3.16 meters. The urban dispersion option was used based on the project site's characteristics.

Offsite sensitive receptors were placed at the Gateway Child Development Center Peninsula, the only sensitive receptors within 1,000 feet of the construction work areas and haul roads. A 20-by-20-meter receptor grid was used to place receptors.

Operational emissions from testing of the new 1,250 kilowatt (approximately 1,700 horsepower) diesel emergency generator were characterized as one separate vertical point source (POINT). The location of the generator in the service and loading yard south of the proposed building was estimated based on Figure 3-5 in Chapter 3, *Project Description*, of this draft EIR, and the urban dispersion option was assumed. The modeling of emissions from generator activities utilized a 12-hour testing window per day (8:00 a.m. to 8:00 p.m.), as testing was assumed to occur during daytime hours. Periodic testing of the generator would be completed; testing is anticipated to consist of one test per week for 30 to 45 minutes per test at a load of 100 percent for up to 50 hours per year maximum, as limited by

[34] Though construction may occur some evenings and weekends, it was assumed that construction would occur during the work week (Monday-Friday) when the Gateway Child Development Center Peninsula, the only sensitive receptors within 1,000 feet of the construction work areas and haul roads, would be operational.

the BAAQMD. Variables, including release height (3.73 meters) and stack diameter (0.21 meters), were taken from comprehensive modeling information provided by the San Joaquin Valley Air Pollution Control District for a 1,500 to 1,850 horsepower generator.[35] Similar to the construction analysis, offsite sensitive receptors were placed at the Gateway Child Development Center Peninsula using a grid with 20-meter spacings. A complete list of dispersion modeling inputs is provided in Appendix B.

Risk Calculations

The risk calculations incorporate OEHHA's age-specific factors that account for increased sensitivity to carcinogens during early-in-life exposure. The approach for estimating cancer risk from long-term inhalation, with exposure to carcinogens, requires calculating a range of potential doses and multiplying by cancer potency factors in units corresponding to the inverse dose to obtain a range of cancer risks. For cancer risk, the risk for each age group is calculated using the appropriate daily breathing rates, age sensitivity factors, and exposure durations. The cancer risks calculated for individual age groups are summed to estimate the cancer risk for each receptor. Chronic cancer and hazard risks were calculated using from OEHHA's 2015 HRA guidance.[36] According to BAAQMD guidance, residential cancer risks assume a 30-year exposure.[37] Because mitigated emissions were used to model cancer risks and PM2.5 concentrations, unmitigated risks and PM2.5 concentrations were scaled proportionate to the unmitigated emissions inventory. The risk calculations and additional assumptions are provided in Appendix B.

Operational Mobile-Source Emissions

Air quality impacts from motor vehicles operating within the air basin while traveling to and from the project site were evaluated using CARB's EMFAC2017 emissions model (version 1.02) and traffic data provided by Fehr & Peers.[38] Because the office building at 701 Gateway Boulevard would remain on the site, operational mobile-source emissions associated with the office building were estimated and presented under existing (2019) and future conditions (2021).[39]

To determine running exhaust emissions (i.e., vehicle movement/travel), the number of employees on the project site daily and the conversion factor for vehicle miles traveled (VMT) per capita, both of which were provided by Fehr & Peers, were used to estimate total VMT with and without the proposed project. The trips generated by daily employees assumes a 26 percent alternative mode share consistent with the City/County Association of Governments (C/CAG) of San Mateo County model and analysis for other similar projects within the City and the region. Criteria pollutant emissions from vehicle running exhaust were then calculated by multiplying the VMT estimates by the appropriate emission factors provided by EMFAC2017.

---

[35] San Joaquin Valley Air Pollution Control District. 2015. *Final Staff Report. Update to District's Risk Management Policy to Address OEHHA's Revised Risk Assessment Guidance Document.* May 28.

[36] Office of Environmental Health Hazard Assessment. 2015. Air Toxics Hot Spots Program Guidance Manual for the Preparation of Risk Assessments. Available: https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf. Accessed: August 3, 2020.

[37] Bay Area Air Quality Management District. 2016. Air Toxics NSR Program Health Risk Assessment Guidelines. December. Available: https://www.baaqmd.gov/~/media/files/planning-and-research/permit-modeling/hra_guidelines_12_7_2016_clean-pdf.pdf. Accessed: August 3, 2020.

[38] Hawkins, Mike. Fehr & Peers. March 13, 2020—email to Jessica Viramontes: 751 Gateway Updated Transportation Materials.

[39] No emissions sources are associated with the existing surface parking lots; therefore, no emissions are associated with the lot under existing conditions.

Daily trips for the proposed project were also provided by Fehr & Peers and used to estimate a per employee trip generation rate, which was used to estimate daily trips associated with the existing building at 701 Gateway Boulevard. The number of daily trips was calculated to quantify vehicle-process emissions, such as emissions generated from vehicle starts, running losses, etc. Process emissions were then calculated by multiplying the number of daily trips by the appropriate process-specific emissions factors from EMFAC2017. The running exhaust emissions and process emissions were combined to quantify total operational emissions from the project's use of vehicles.

The analysis incorporates CARB's criteria pollutant adjustment factors to account for Part 1 of the SAFE Vehicle Rule. The EMFAC0217 emissions factors and traffic data used in this analysis are provided in Appendix B of this draft EIR.

Refer to Section 4.9, *Transportation and Circulation,* of this draft EIR for more details regarding the project's trip generation.

Operational Area-, Energy-, and Stationary-Source Emissions

Area, energy, and stationary emissions were estimated using CalEEMod (version 2016.4.2). Area-source emissions are generated by the use of consumer products, the use of landscape maintenance equipment, and the repainting of buildings. Energy sources include the combustion of natural gas for building heating and hot water. Stationary sources include emergency backup generators. Emissions were quantified for existing and project conditions.[40] Operational emissions were estimated using project-specific details (e.g., energy consumption, emergency generator specifications) and the use of CalEEMod defaults when project-specific details were not available. Similar to mobile-source emissions, area-, energy-, and stationary-source emissions were also estimated for the existing office building at 701 Gateway Boulevard. The CalEEMod output files are provided in Appendix B of this draft EIR.

4.2.4.3 Impact Evaluation

Impact AQ-1: The proposed project would not conflict with or obstruct implementation of the applicable air quality plan. (*Less than Significant*)

The CAA requires that a SIP or an air quality control plan be prepared for areas with air quality that violates the NAAQS. The SIP sets forth the strategies and pollution control measures that states will use to attain the NAAQS. The California CAA requires attainment plans to demonstrate a 5 percent per year reduction in nonattainment air pollutants or their precursors, averaged every consecutive 3-year period, unless an approved alternative measure of progress is developed. Air quality attainment plans (AQAPs) outline emissions limits and control measures to achieve and maintain these standards by the earliest practical date. The current AQAP for the SFBAAB is the 2017 Clean Air Plan.[41]

40 Ibid.

41 Bay Area Air Quality Management District. 2017a. *Final 2017 Clean Air Plan.* Adopted: April 19. Available: https://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en. Accessed: January 6, 2020.

Support of 2017 Clean Air Plan Goals

The primary goals of the 2017 Clean Air Plan are to attain all state and national air quality standards and eliminate disparities among Bay Area communities in cancer health risk from toxic air contaminants. As discussed below (Impact AQ-2), the proposed project would not exceed BAAQMD's criteria pollutant thresholds and would not result in a significant level of air pollution such that air quality within the SFBAAB would be degraded. As such, the proposed project would not contribute to increases in the CAAQS and NAAQS and, thus, would not prevent attainment of the state and national air quality standards. As further discussed below (Impact AQ-3), the project would not have a significant impact related to TACs and thus would not contribute to disparities among Bay Area communities. Therefore, based on the above analysis, the proposed project would support the primary goals of the 2017 Clean Air Plan.

Support Applicable Control Measures and Their Implementation

To meet the primary goals of the 2017 Clean Air Plan, specific control measures and actions are recommended. These control measures are grouped into various categories and include stationary-source measures, mobile-source measures, and transportation control measures. The 2017 Clean Air Plan recognizes that community design dictates individual travel modes and that a key long-term control strategy for reducing emissions of criteria pollutants, air toxics, and GHGs from motor vehicles is to channel future Bay Area growth into vibrant urban communities where goods and services are close at hand and people have a range of viable transportation options. To this end, the 2017 Clean Air Plan includes control measures to reduce air pollution in the SFBAAB.

The measures most applicable to the proposed project are transportation, energy, building, waste management, water, and stationary-source control measures. These measures include the following:

- TR1: Clean Air Teleworking Initiative – Develop teleworking best practices for employers and develop additional strategies to promote telecommuting. Promote teleworking on Spare the Air Days.
- TR2: Trip Reduction Programs – Implement the regional Commuter Benefits Program (Rule 14-1), which requires employers with 50 or more Bay Area employees to provide commuter benefits. Encourage trip reduction policies and programs in local plans (e.g., general and specific plans) while providing grants to support trip reduction efforts. Encourage local governments to require mitigation of vehicle travel as part of new development approval, adopt transit benefit ordinances in order to reduce transit costs to employees, and develop innovative ways to encourage ride sharing, transit, cycling, and walking for work trips. Fund various employer-based trip reduction programs.
- TR8: Ridesharing, Last-Mile Connection – Promote carpooling and vanpooling by providing funding to continue regional and local ride-sharing programs and support the expansion of car-sharing programs. Provide incentive funding for pilot projects to evaluate the feasibility and cost effectiveness of innovative ride sharing and other last-mile trip reduction strategies. Encourage employers to promote ride sharing and car sharing to their employees.
- TR9: Bicycle and Pedestrian Access and Facilities – Encourage planning for bicycle and pedestrian facilities in local plans (e.g., general and specific plans) to fund bike lanes, routes, paths, and bicycle parking facilities.

- TR13: Parking Policies – Encourage parking policies and programs in local plans (e.g., reduce minimum parking requirements), limit the supply of off-street parking in transit-oriented areas, unbundle the price of parking spaces, and support implementation of demand-based pricing (such as “SF Park”) in high-traffic areas.
- TR14: Cars and Light Trucks – Commit regional clean air funds toward qualifying vehicle purchases and infrastructure development. Partner with private, local, state, and federal programs to promote the purchase and lease of battery and plug-in hybrid electric vehicles.
- TR15: Public Outreach and Education – Implement the Spare the Air Every Day Campaign, including Spare the Air alerts, employer programs, community resource teams, a PEV outreach campaign, and the Spare the Air Youth Program.
- TR23: Lawn and Garden Equipment – Seek additional funding to expand the Commercial Lawn and Garden Equipment Replacement Program into all nine Bay Area counties. Explore options to expand Lawn and Garden Equipment Program to cover shredders, stump grinders, and commercial turf equipment.
- EN2: Decrease Electricity Demand – Work with local governments to adopt additional energy efficiency policies and programs. Support local government energy efficiency programs through best practices, model ordinances, and technical support. Work with partners to develop messaging to decrease electricity demand during peak times.
- BL1: Green Buildings – Collaborate with partners such as KyotoUSA to identify energy-related improvements and opportunities for on-site renewable energy systems in school districts; investigate funding strategies to implement upgrades. Identify barriers to effective local implementation of the CALGreen (Title 24) statewide building energy code; develop solutions to improve implementation/enforcement. Work with ABAG’s BayREN program to make additional funding available for energy-related projects in the buildings sector. Engage with additional partners to target reducing emissions from specific types of buildings.
- BL2: Decarbonize Buildings – Explore potential air district rulemaking options regarding the sale of fossil fuel–based space and water heating systems for both residential and commercial use. Explore incentives for property owners to replace their furnace, water heater, or natural-gas-powered appliances with zero-carbon alternatives. Update air district guidance documents to recommend that commercial and multi-family developments install ground-source heat pumps and solar hot water heaters.
- BL4: Urban Heat Island Mitigation – Develop and urge adoption of a model ordinance for “cool parking” that promotes the use of cool surface treatments for new parking facilities as well as existing surface lots undergoing resurfacing. Develop and promote adoption of model building code requirements for new construction or re-roofing/roofing upgrades for commercial and residential multi-family housing. Collaborate with expert partners to perform outreach to cities and counties to make them aware of cool roofing and cool paving techniques and new tools that are available.
- NW2: Urban Tree Planting – Develop or identify an existing model municipal tree planting ordinance and encourage local governments to adopt such an ordinance. Include tree planting recommendations, the air district’s technical guidance, best practices for local plans, and CEQA review.

- WA3: Green Waste Diversion – Develop model policies to facilitate local adoption of ordinances and programs to reduce the amount of green waste going to landfills.
- WA4: Recycle and Waste Reduction – Develop or identify and promote model ordinances on community-wide zero-waste goals and recycling of construction and demolition materials in commercial and public construction projects.
- WR2: Support Water Conservation – Develop a list of best practices that reduce water consumption and increase on-site water recycling in new and existing buildings; incorporate into local planning guidance.
- SS32: Emergency Backup Generators – Reduce emissions of diesel particulate matter and black carbon from backup generators through Draft Rule 11-18, resulting in reduced health risks to affected individuals and climate protection benefits.

The proposed project would include design features that would support emissions reductions in the transportation sector. For instance, the proposed project's TDM plan would promote transit and pedestrian connectivity and support transit priority measures (Measure TR9). The proposed project would construct new transit infrastructure, such as the new shuttle stop on the western portion of the access drive north of the existing building at 701 Gateway Boulevard, and improve the connection to the existing shuttle stop on the eastern side of Gateway Boulevard (Measures TR2 and TR8) . Other improvements, such as electric charging stations and bicycle parking, would support alternative modes of transportation within the project site (Measures TR8, TR9, and TR14). The proposed project, through its TDM plan, would monitor parking demand and require annual travel surveys as part of ongoing outreach to evaluate the effectiveness of on-site programs (e.g., telecommuting) as well as the transportation demand measures (Measures TR1, TR13, and TR15).

In addition, the proposed project would implement a number of sustainability features, such as solar-ready rooftop connectivity for future installation of photovoltaic panels and Energy Star–rated and high-efficiency appliances (Measures BL1, BL2, BL4, and EN2); green infrastructure (e.g., biotreatment areas and other low-impact development) (Measures BL1 and NW2); low-flow shower heads, aerators, and toilets (Measure WR2); and waste diversion programs to reduce resource consumption as well as criteria pollutant and GHG emissions (Measures WA3 and WA4). The proposed project would be designed to meet the standards of the South San Francisco Municipal Code, CALGreen building requirements, LEED Gold certification, as well as International WELL and Fitwel Building Institute Standards (Measures BL-2 and EN2). The proposed project would result in a net tree loss (approximately 19 trees) with implementation of Mitigation Measure GHG-2. However, because younger trees typically sequester more CO_2e compared to older and more mature trees, additional sequestration from newer trees planted as part of the proposed project could offset the loss of carbon sequestration from the net tree loss (Measure NW2). In addition, shrubs and biotreatment plantings as opposed to grass areas would in installed to further reduce emissions associated with lawn and garden equipment (Measure TR23). The proposed emergency generator would be subject to the permit authority of the BAAQMD to reduce associated health risks and air quality impacts (Measure SS32).

Based on the above analysis, the proposed project would generally support most of the applicable control measures and their implementation identified in the 2017 Clean Air Plan to meet the plan's primary goals.

Disrupt or Hinder Implementation of 2017 Clean Air Plan Control Measures

As discussed above, the proposed project would incorporate sustainable design features that address the transportation, energy, building, waste management, water, and stationary-source sectors. It would not disrupt, delay, or otherwise hinder implementation of any applicable control measure from the 2017 Clean Air Plan. Rather, the proposed project would support and facilitate implementation of control measures.

Based on the above analysis, the proposed project would support implementation of the 2017 Clean Air Plan. Accordingly, the proposed project would not fundamentally conflict with the 2017 Clean Air Plan and would have a ***less-than-significant*** air quality impact. No mitigation measures are required.

Impact AQ-2: The proposed project would not result in a cumulatively considerable net increase in any criteria pollutant for which the project region is classified as nonattainment under an applicable federal or state ambient air quality standard. (*Less than Significant with Mitigation during construction; Less than Significant during operation*)

Construction

Construction and demolition activities for the proposed project would include demolition of a surface parking lot, construction of a new building, various site improvements, and the provision of utility infrastructure. If the related entitlements are approved by the City, construction of the proposed project would begin in 2020 and occur over approximately 18 months, with anticipated completion in 2021. Construction and demolition activities would require mobile and stationary equipment as well as on-road vehicles, such as haul trucks for demolition debris and vendor trucks for deliveries. Site grading and excavation would be required for the building foundation, utilities, and landscaping. The unmitigated criteria air pollutant emissions that would be generated during construction were estimated using CalEEMod (version 2016.4.2), as presented in Table 4.2-5.

Table 4.2-5. Estimated Unmitigated Criteria Pollutant Emissions from Construction of the Proposed Project (pounds/day)

				PM10		PM2.5	
Construction Year	**ROG**	**NO_X**	**CO**	**Dust**	**Exhaust**	**Dust**	**Exhaust**
2020	7	<u>68</u>	41	1	2	< 1	2
2021	29	46	31	14	1	3	5
BAAQMD Threshold	54	54	—	BMPs	82	BMPs	54
Exceed Threshold?	No	Yes	—	—	No	—	No

Source: See Appendix B of this draft EIR for CalEEMod outputs.

Exceedances of the BAAQMD thresholds are underlined.

ROG= reactive organic gases; NO_X = nitrogen oxide; CO = carbon monoxide; PM10 = particulate matter no more than 10 microns in diameter; PM2.5 = particulate matter no more than 2.5 microns in diameter; BAAQMD = Bay Area Air Quality Management District; BMPs = best management practices.

As shown in Table 4.2-5, construction of the proposed project would not generate ROG or PM exhaust emissions in excess of BAAQMD's numeric thresholds. However, the proposed project would generate NO_X emissions in excess of BAAQMD's significance threshold during construction in 2020. These emissions, if left unmitigated, could contribute to a ground-level formation of ozone in the SFBAAB, which, at certain concentrations, could contribute to short- and long-term human health effects. Currently, San Mateo County does not meet the NAAQS and CAAQS for ozone or the CAAQS for PM (see Table 4.2-2). Certain individuals residing in areas that do not meet the ambient air quality standards, including South San Francisco, could be exposed to pollutant concentrations that could cause or aggravate acute and/or chronic health conditions (e.g., asthma, premature mortality). Although construction of the proposed project would contribute to future NO_X emissions, maximum daily construction-generated NO_X emissions would represent approximately 0.01 percent of the total NO_X in the SFBAAB.[42] As previously discussed, the magnitude and location of any potential change in ambient air quality, as well as the health consequences associated with additional emissions, cannot be quantified with a high level of certainty because of the dynamic and complex nature of pollutant formation and its distribution. However, it is known that public health will continue to be affected in South San Francisco as long as the region fails to meet the NAAQS and CAAQS.

Implementation of Mitigation Measure AQ-1, Use Clean Diesel-Powered Equipment during Construction to Control Construction-Related NO_X Emissions, would reduce construction-related NO_X to below BAAQMD's threshold, as shown in Table 4.2-6. BAAQMD's CEQA Guidelines consider fugitive dust impacts to be less than significant with application of best management practices (BMPs). If BMPs are not implemented, the dust impact would be ***significant***. Therefore, Mitigation Measure AQ-2, Implement BAAQMD Basic Construction Mitigation Measures, which includes BMPs to reduce fugitive dust, would be implemented to reduce impacts from construction-related fugitive dust emissions, including any cumulative impacts. As such, construction of the proposed project would not be expected to contribute a significant level of air pollution such that air quality within the SFBAAB would be degraded. Consequently, the impact from construction-generated criteria pollutant emissions would be ***less than significant with mitigation***.

Table 4.2-6. Estimated Mitigated Criteria Pollutant Emissions from Construction of the Proposed Project (pounds/day)

				PM10		PM2.5	
Construction Year	**ROG**	**NO_X**	**CO**	**Dust**	**Exhaust**	**Dust**	**Exhaust**
2020	2	14	78	1	< 1	< 1	1
2021	28	11	62	14	< 1	3	4
BAAQMD Threshold	54	54	—	BMPs	82	BMPs	54
Exceed Threshold?	No	No	—	—	No	—	No

Source: See Appendix B of this draft EIR for CalEEMod outputs.

Emissions data in this table assume implementation of Mitigation Measure AQ-1. However, implementation of dust-related best management practices have not been explicitly quantified but would be required. ROG = reactive organic gas; NO_X = nitrogen oxide; CO = carbon monoxide; PM10 = particulate matter no more than 10 microns in diameter; PM2.5 = particulate matter no more than 2.5 microns in diameter; BAAQMD = Bay Area Air Quality Management District; BMPs = best management practices.

42 NO_X emissions reported in the Clean Air Plan totaled 300 tons per day. Maximum project-generated NO_X emissions would be 87 pounds per day, which equates to 0.0435 ton per day.

Mitigation Measure AQ-1: Use Clean Diesel-Powered Equipment during Construction to Control Construction-Related NO_X Emissions

The project sponsor shall ensure that all off-road diesel-powered equipment used during construction is equipped with EPA-approved Tier 4 Final engines. The construction contractor shall submit evidence of the use of EPA-approved Tier 4 Final engines or cleaner for project construction to the City prior to the commencement of construction activities.

Mitigation Measure AQ-2: Implement BAAQMD Basic Construction Mitigation Measures

The project sponsor shall require all construction contractors to implement the basic construction mitigation measures recommended by BAAQMD. The emissions reduction measures shall include, at a minimum, the following:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, unpaved access roads) shall be watered two times a day.
- All haul trucks shall be covered when transporting soil, sand, or other loose material offsite.
- All visible mud or dirt track-out material on adjacent public roads shall be removed using wet-power vacuum-type street sweepers at least once a day. The use of dry-power sweeping is prohibited.
- All vehicle speeds shall be limited to 15 miles per hour on unpaved roads.
- All roadways, driveways, and sidewalks that are to be paved shall be paved as soon as possible. Building pads shall be laid as soon as possible after grading, unless seeding or a soil binder is used.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturers' specifications. All equipment shall be checked by a certified visible-emissions evaluator.
- Idling times shall be minimized, either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California Airborne Toxics Control Measure).
- Publicly visible signs shall be posted with the telephone number and name of the person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations.

Operation

Operation of the proposed project has the potential to result in air quality impacts from area, energy, mobile, and stationary sources. Area sources would include landscaping equipment; architectural coatings, with off-gassing during reapplication; and consumer products (e.g., solvents, cleaning supplies, cosmetics, toiletries). Energy sources would include on-site natural gas combustion for space and water heating. Mobile sources would include vehicle trips generated by land uses proposed within the project site. Stationary sources would include the testing of emergency generators. Each of these sources was considered in calculating the proposed project's long-term operational emissions, which were quantified using CalEEMod for area, energy, and stationary sources and EMFAC2017 for mobile sources, as described above.

Table 4.2-7 summarizes daily area-, energy-, mobile-, and stationary-source emissions generated under existing (2019) and 2021 conditions with the proposed project. No changes are proposed at the existing office building at 701 Gateway Boulevard; therefore, emissions estimated for the office building also represent 2021 conditions without the proposed project. To evaluate the magnitude of the change in the air quality environment due to implementation of the proposed project, emissions under 2021 conditions were compared to the emissions under existing (2019) conditions.

As shown in Table 4.2-7, the proposed project would result in a net increase in ROG (approximately 11 pounds per day), NO_X (26 pounds per day), CO (61 pounds per day), PM10 (59 pounds per day), and PM2.5 (16 pounds of per day). However, it would not exceed BAAQMD's numeric thresholds. Therefore, air quality impacts from criteria pollutant emissions would be ***less than significant*** during operation. No mitigation is required. Although not required to support a less-than-significant determination or quantified for the purposes of this analysis, implementation of Mitigation Measure TR-1, as discussed in Section 4.9, *Transportation and Circulation,* of this draft EIR, would fund the design and construction of offsite improvements to support the proposed project's first- and last-mile transportation demand management strategies, which would further reduce emissions.

Table 4.2-7. Estimated Criteria Pollutant Emissions from Operation of the Proposed Project (pounds/day)

Condition/Source	ROG	NO_X	CO	PM10	PM2.5
Existing (2019)					
701 Gateway (existing office building) and 751 Gateway (existing parking lot)					
Area Sources	4	< 1	< 1	< 1	< 1
Energy Sources	< 1	1	1	<1	< 1
Mobile Sources	2	9	42	36	9
Stationary Sources	3	15	9	< 1	< 1
Total[a]	10	25	52	37	10
Proposed Project (2021)					
701 Gateway (existing office building)					
Area Sources	4	< 1	< 1	< 1	< 1
Energy Sources	< 1	1	1	0	0
Mobile Sources	2	7	36	36	9
Stationary Sources	3	15	9	0	0
751 Gateway (proposed R&D and office building)					
Area Sources	5	< 1	< 1	< 1	< 1
Energy Sources	0	1	1	0	0
Mobile Sources	< 1	12	58	59	15
Stationary Sources	3	15	9	0	0
Total[a]	21	51	112	96	26
Net Increase with Proposed Project					
2021 v. Existing	11	26	61	59	16
BAAQMD Threshold	54	54	—	82	54
Exceed Threshold?	No	No	—	No	No

Source: See Appendix B of this draft EIR for CalEEMod outputs and EMFAC2017 calculations.

ROG= reactive organic gases; NO_X = nitrogen oxide; CO = carbon monoxide; PM10 = particulate matter no more than 10 microns in diameter; PM2.5 = particulate matter no more than 2.5 microns in diameter; BAAQMD = Bay Area Air Quality Management District.

[a] Totals may not add up because of rounding.

The improvements would require City acquisition of private right-of-way and funding from other sources. Should the improvements recommended in Mitigation Measure TR-1 be implemented, mobile-source emissions would be less than the emissions presented in Table 4.2-7.

Impact AQ-3: The proposed project would not expose sensitive receptors to substantial pollutant concentrations. (*Less than Significant with Mitigation during construction; Less than Significant during operation*)

The primary pollutants of concern to human health generated by the proposed project are criteria pollutants and TACs.

Regional Criteria Pollutants

In its *Sierra Club v. County of Fresno* decision (6 Cal.5th 502), hereafter referred to as the Friant Ranch Decision, the California Supreme Court reviewed the long-term regional air quality analysis contained in the EIR for the proposed Community Plan Update and Friant Ranch Specific Plan (Friant Ranch Project). The Friant Ranch Project is a 942-acre master-plan development in unincorporated Fresno County and the San Joaquin Valley Air Basin, which is currently in nonattainment under the NAAQS and CAAQS for ozone and PM2.5. The court found that the EIR's air quality analysis was inadequate because it failed to provide enough detail "for the public to translate the bare [criteria pollutant emissions] numbers provided into adverse health impacts or to understand why such a translation is not possible at this time." According to the court's decision, environmental documents must attempt to connect a project's regional air quality impacts to specific health effects or explain why it is not technically feasible to perform such an analysis. As noted above, this project would not contribute to significant cumulative regional air quality impacts.

Models and tools have been developed to correlate regional criteria pollutant emissions with potential community health impacts. Appendix B of this draft EIR summarizes many of these tools, describes their intended application and resolution, and determines whether they could be used to reasonably correlate project-level emissions with specific health consequences. As described in Appendix B, although some models are capable of quantifying ozone and secondary PM formation, as well as associated health effects, these tools were developed to support regional planning and policy analysis. They have limited sensitivity with respect to the small changes in criteria pollutant concentrations induced by smaller individual projects, such as a few office buildings or a single multi-family building. Therefore, translating project-generated criteria pollutants to locations where specific health effects could occur or calculating the resultant number of additional days of nonattainment cannot be achieved with any degree of accuracy for relatively small projects (relative to the regional air basin).

As discussed above, BAAQMD's regional thresholds, as presented in Table 4.2-4, consider existing air quality concentrations and attainment or nonattainment designations under the NAAQS and CAAQS. The NAAQS and CAAQS are informed by a wide range of scientific evidence that demonstrates that there are known safe concentrations of criteria pollutants. Although recognizing that air quality is a cumulative problem, BAAQMD considers projects that generate criteria pollutant and ozone precursor emissions that are below the thresholds to be minor in nature; they would not adversely affect air quality to the extent that the health-protective NAAQS or CAAQS would be exceeded. Regional emissions generated by a project could increase photochemical reactions and the formation of tropospheric ozone and secondary PM, which, at certain concentrations, could lead to increased incidences of specific health consequences. Although these health effects are associated with ozone and particulate pollution, the effects are a result of cumulative and regional emissions.

Therefore, the project's incremental contribution cannot be traced to specific health outcomes on a regional scale, and a quantitative correlation of project-generated regional criteria pollutant emissions to specific human health impacts is not included in this analysis. Mitigation is being applied to reduce construction emissions of ozone precursors and PM to the extent possible (i.e., Mitigation Measure AQ-1, Use Clean Diesel-Powered Equipment during Construction to Control Construction-Related NO_X Emissions, and Mitigation Measure AQ-2, Implement BAAQMD Basic Construction Mitigation Measures). The project's operational emissions would not exceed the BAAQMD thresholds.

Localized Criteria Pollutants

Localized criteria pollutants generated by the proposed project (e.g., fugitive dust, carbon monoxide) can be deposited near an emissions source, with the potential to affect a population near that emissions source. Although these pollutants dissipate with distance, emissions from individual projects can result in direct and material health impacts on adjacent sensitive receptors. As discussed above, the NAAQS and CAAQS are health-protective standards. They have been set at levels that are considered safe to protect public health, including the health of sensitive populations, such as asthmatics, children, and the elderly.

During grading and excavation activities associated with construction, localized fugitive dust would be generated. The amount of dust generated by a project is highly variable and dependent on the size of the disturbed area at any given time, the amount of activity, soil conditions, and meteorological conditions. BAAQMD considers dust impacts to be less than significant if BAAQMD's construction BMPs are employed to reduce such emissions. Because BAAQMD's Basic Construction Mitigation Measures would be implemented, per Mitigation Measure AQ-2, Implement BAAQMD Basic Construction Mitigation Measures, construction-related fugitive dust emissions would be less than significant and would not expose receptors to substantial pollutant concentrations or risks.

The proposed project would install a new generator on the project site, which would increase $PM_{2.5}$ concentrations. The nearest sensitive receptors are located at the Gateway Child Development Center Peninsula, approximately 670 feet south of the project site; thus, the proposed project may expose receptors to substantial pollutant concentrations or risks. $PM_{2.5}$ concentrations anticipated from the generator are discussed below in conjunction with toxic air contaminants.

Continuous engine exhaust may elevate localized CO concentrations, resulting in hot spots. Receptors who are exposed to these CO hot spots may have a greater likelihood of developing adverse health effects. CO hot spots are typically observed at heavily congested intersections where a substantial number of gasoline-powered vehicles idle for prolonged durations throughout the day. As discussed in Section 4.2.4.1, *Significance Criteria*, BAAQMD has developed screening criteria to assist lead agencies in evaluating potential impacts from localized CO. The proposed project would fall within BAAQMD's CO hot-spot screening criteria. The proposed project would not increase traffic volumes at any intersection to more than 44,000 vehicles per hour or 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited, levels specified by BAAQMD, and would be consistent with the applicable congestion management plan.[43] Therefore, the proposed project would not contribute to a localized CO hot spot and would not expose receptors to substantial CO concentrations or risks.

[43] Hawkins, Mike. Fehr & Peers. February 14, 2020—email to Jessica Viramontes: 751 Gateway – Transportation Schedule Check In.

Toxic Air Contaminants

The primary TAC of concern associated with the proposed project is DPM. DPM is a carcinogen emitted by diesel internal combustion engines. Construction activities would generate DPM ($PM_{2.5}$ exhaust)[44] that could expose adjacent receptors to significant health risks. DPM concentrations would be dramatically reduced as distance between the construction activities and sensitive receptors increases. As noted in BAAQMD's CEQA Guidelines:

> Due to the variable nature of construction activity, the generation of TAC emissions in most cases would be temporary, especially considering the short amount of time such equipment is typically within an influential distance that would result in the exposure of sensitive receptors to substantial concentrations. Concentrations of mobile-source diesel PM emissions are typically reduced by 70 percent at a distance of approximately 500 feet… In addition, current models and methodologies for conducting health risk assessments are associated with longer-term exposure periods of 9, 40, and 70 years, which do not correlate well with the temporary and highly variable nature of construction activities. This results in difficulties with producing accurate estimates of health risk.[45]

As discussed under Impact AQ-2, Mitigation Measure AQ-1, Use Clean Diesel-Powered Equipment during Construction to Control Construction-Related NO_X Emissions, and Mitigation Measure AQ-2, Implement BAAQMD Basic Construction Mitigation, are required to reduce construction emissions below air district thresholds. As such, mitigated construction emissions were modeled to determine localized health risks. Table 4.2-8 presents the maximum mitigated construction-related health risks at the Gateway Child Development Center Peninsula, the only sensitive receptors within 1,000 feet of the construction work areas and haul roads. As shown in Table 4.2-8, cancer risk, chronic hazard risk, and annual $PM_{2.5}$ concentration would not exceed BAAQMD's thresholds with implementation of Mitigation Measure AQ-1 and AQ-2. Although not anticipated with demolition of the surface parking lot, any asbestos encountered during construction would be subject to BAAQMD Regulation 11, Rule 2. Compliance with this rule would ensure a less-than-significant asbestos impact.

Table 4.2-8. Mitigated Project-level Cancer and Chronic Hazard Risks and $PM_{2.5}$ Concentrations During Construction

Receptor	Cancer Risk (cases per million)	Non-Cancer Hazard Index	Annual $PM_{2.5}$ Concentration ($\mu g/m^3$)
Gateway Child Development Center Peninsula	0.6	<0.01	<0.01
Significance Threshold	*10*	*1*	*0.3*
Exceed Threshold?	*No*	*No*	*No*

Source: See Appendix B for modeling outputs and calculations.
Notes:
Emissions assumes the implementation of Mitigation Measure AQ-1 and AQ-2. However, implementation of dust best management practices, other than watering two times a day and limiting speed to 15 miles per hour, have not been explicitly quantified per Mitigation Measure AQ-2, but would be required.
$\mu g/m^3$ = micrograms per cubic meter; $PM_{2.5}$ = particulate matter no more than 2.5 microns in diameter

44 Per BAAQMD guidance, PM2.5 exhaust is used as a surrogate for DPM.
45 Bay Area Air Quality Management District. 2017b. *California Environmental Quality Act, Air Quality Guidelines.* May Available: http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed: January 6, 2020.

In addition, the proposed project would include installation and operation of a diesel-fueled generator, a new stationary source of TACs. All new stationary sources would be subject to the permit authority of the BAAQMD. The BAAQMD will not issue a permit for a new permitted source that results in an operational cancer risk in excess of 10.0 cases per million or a hazard index in excess of 1.0. However, because BAAQMD's permit does not specifically address $PM_{2.5}$, concentrations from testing of the emergency generator were modeled and results are presented in Table 4.2-9. Cancer and non-cancer health risks are presented for informational purposes only; regulatory mechanisms would ensure health risk impacts from the stationary source would be less than significant. As shown in Table 4.2-9, operation of the proposed project would not result in a significant increase in $PM_{2.5}$ exhaust concentrations at the Gateway Child Development Center Peninsula, the only sensitive receptors within 1,000 feet of the construction work areas and haul roads.

Table 4.2-9. Project-level Cancer and Chronic Hazard Risks and PM.5 Concentrations During Operation

Receptor	Cancer Risk (cases per million)	Non-Cancer Hazard Index	Annual $PM_{2.5}$ Concentration (μg/m^3)
Gateway Child Development Center Peninsula	0.1	<0.01	<0.01
Significance Threshold	*10*	*1*	*0.3*
Exceed Threshold?	*No*	*No*	*No*

Source: See Appendix B for modeling outputs and calculations.
Notes: μg/m3 = micrograms per cubic meter; $PM_{2.5}$ = particulate matter no more than 2.5 microns in diameter

Air quality impacts during construction would be ***less than significant with mitigation***. Air quality impacts during operation would be ***less than significant*** and no mitigation is required.

Impact AQ-4: The proposed project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people. (*Less than Significant*)

BAAQMD and CARB have identified the following types of land uses as being commonly associated with odors. Although this list is not exhaustive, it is intended to help lead agencies recognize the types of facilities where more analysis may be warranted.

- Sewage treatment plants
- Coffee roasters
- Asphalt plants
- Metal smelters
- Landfills
- Recycling facilities
- Waste transfer stations
- Petroleum refineries
- Biomass operations
- Auto body shops
- Coating operations

- Fiberglass manufacturers
- Foundries
- Rendering plants
- Livestock operations

There are sensitive receptors within 1,000 feet of the project site, but the project would not include new sensitive receptors. As discussed above, the California Supreme Court has opined that impacts of the environment on projects are not subject to CEQA analysis, with limited exceptions. This general rule includes the impacts of existing odor-generating uses on future land uses. None of the above land uses are within 1 mile of the project site. The proposed project does not propose any changes that would affect odor-generating facilities. Therefore, odor complaints regarding existing odor-generating facilities are not anticipated upon implementation of the proposed project.

The potential odor-generating land uses identified above are generally not allowed under the City's existing Gateway Specific Plan District (commercial and research-and-development) zoning designations, as would continue to be the case with approval of the proposed project. The proposed project would not expressly encourage these uses or a substantial increase in the amount of land zoned for such uses. In addition, because the proposed project would be required to comply with the local zoning ordinance, odor-generating uses would be developed only in areas that are zoned for such uses, and would not be included in the proposed project.

Potential odor emitters during construction include diesel exhaust, asphalt paving, and the use of architectural coatings and solvents. However, construction-related operations would be temporary and would not be likely to result in nuisance odors that would violate BAAQMD's Regulation 7. Odors during operation could emanate from vehicle exhaust and the application of architectural coatings. These odors would be limited to areas adjacent to the building. Although such brief exhaust- and paint-related odors may be considered adverse, they would not affect a substantial number of people. Given mandatory compliance with BAAQMD rules, none of the proposed construction or operational activities would create a significant level of objectionable odors. Therefore, odor impacts would be ***less than significant***. No mitigation is required.

4.2.4.4 Cumulative Impacts

The cumulative geographic context for air quality is the SFBAAB. The cumulative geographic context for health risks and odors is the immediate vicinity of the project site (i.e., 1,000 feet). Cumulative projects within 0.5 mile (2,640 feet) of the project site are described in Section 4.1.5, *Approach to Cumulative Impact Analysis*, of this draft EIR and shown in Figure 4.1-1.

Impact C-AQ-1: The proposed project in combination with past, present, and reasonably foreseeable future projects would not result in a cumulatively considerable impact on air quality plan consistency. *(Less than Significant)*

As discussed under Impact AQ-1, the proposed project would support the goals of BAAQMD's Clean Air Plan, would include all applicable control measures, and would not conflict with Clean Air Plan implementation. The purpose of the Clean Air Plan is to improve regional air quality in the air basin; therefore, the analysis and less-than-significant finding under Impact AQ-1 is inherently cumulative. For these reasons, the proposed project in combination with past, present, and reasonably foreseeable future projects would not result in a significant cumulative impact related to air quality plan consistency. The cumulative impact would be ***less than significant***. No mitigation is required.

Impact C-AQ-2: The proposed project would not result in a cumulatively considerable contribution to significant cumulative impacts related to a net increase in criteria pollutants for which the region is in nonattainment for an applicable federal or state ambient air quality standard. *(Less than Significant with Mitigation)*

As discussed above, BAAQMD has identified project-level thresholds to evaluate criteria pollutant impacts (Table 4.2-4). In developing these thresholds, BAAQMD considers levels at which project emissions are cumulatively considerable. As noted in BAAQMD's guidelines,

> In developing thresholds of significance for air pollutants, BAAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts on the region's existing air quality conditions. Therefore, additional analysis to assess cumulative impacts is unnecessary.

Exceedances of project-level thresholds would be cumulatively considerable, and the cumulative impact would be significant. As discussed under Impact AQ-2, construction of the proposed project would not generate ROG or PM emissions in excess of BAAQMD's numeric thresholds. However, the proposed project would generate NO_X in excess of BAAQMD's daily threshold. Implementation of Mitigation Measure AQ-1, Use of Clean Diesel-Powered Equipment during Construction to Control Construction-Related NO_X Emissions, would reduce NO_X emissions to a less-than-significant level (see Table 4.2-6). In addition, Mitigation Measure AQ-2, Implement BAAQMD Basic Construction Mitigation Measures, would require construction within the project site to implement BMPs as recommended by BAAQMD to reduce fugitive dust emissions to less-than-significant levels. As discussed above, air quality impacts would be below BAAQMD's numeric thresholds during operation. Accordingly, the proposed project's contribution to a cumulative criteria pollutant emissions impact would be ***less than cumulatively considerable with mitigation***.

Impact C-AQ-3: The proposed project in combination with past, present, and reasonably foreseeable future projects would not contribute to cumulative health risks for sensitive receptors. *(Less than Significant with Mitigation)*

The project at 475 Eccles Avenue (Cumulative Project No. 16), which would involve new office/R&D buildings, is the only cumulative project located within 1,000 feet of the project site. There are no sensitive receptors within 1,000 feet of 475 Eccles Avenue. Construction and operation of the project at 475 Eccles Avenue would generate TACs but would be reduced with distance from the site and BAAQMD's regulatory mechanisms for stationary sources, respectively.

In addition, the proposed project would involve construction activities and locate a new diesel-fueled generator on the project site, generating DPM and $PM_{2.5}$. There are existing nearby DPM and $PM_{2.5}$ sources within 1,000 feet of the project site which, along with the proposed project, could contribute to a cumulative health risk for existing sensitive receptors at the Gateway Child Development Center Peninsula. This is a potentially significant impact. BAAQMD data files and distance multipliers provided by the BAAQMD were used to estimate the background impacts and concentrations for existing stationary, roadway, and rail sources. The combined risks from construction and operation of the proposed project and ambient sources are summarized in Table 4.2-10. The methods used to estimate project emissions are described above in *Methods for Analysis* and supplemented with more detail in Appendix B.

Table 4.2-10. Maximum Mitigated Cumulative Health Risks from the Proposed Project

Source	Cancer Risk (case per million)	Non-Cancer Hazard Index	Annual $PM_{2.5}$ Concentration ($\mu g/m^3$)
Contribution from Existing Sources[a]			
Stationary Sources	6.7	0.07	0.04
Roadway Sources	14.0	-	0.29
Rail Sources	21.6	-	0.04
Contribution from Project Construction[b]			
Gateway Child Development Center Peninsula	0.6	<0.01	<0.01
Contribution from Project Operation			
Gateway Child Development Center Peninsula	0.1	<0.01	<0.01
Cumulative Totals			
Existing + Construction	42.8	0.07	0.37
Existing + Operation	42.4	0.07	0.37
Existing + Construction + Operation	**43.0**	**0.07**	**0.37**
BAAQMD Thresholds	*100*	*10*	*0.8*

Source: See Appendix B for modeling outputs and calculations.
Notes:
$\mu g/m^3$ = micrograms per cubic meter
[a] Contribution from existing sources represent the health risks within 1,000 feet of the maximum exposed receptor at the Gateway Child Development Center Peninsula.
[b] Contributions from project construction reported with implementation of construction mitigation measures.

As shown in Table 4.2-10, cumulative risks and concentration levels of existing sources (i.e., stationary, roadway, and rail sources) do not exceed BAAQMD's cumulative thresholds. Implementation of Mitigation Measures AQ-1 and AQ-2 would reduce risks and concentration levels associated with construction (e.g., diesel particulate matter, $PM_{2.5}$ exhaust, $PM_{2.5}$ fugitive dust) of the proposed project and the the combined total cumulative cancer risks and hazard impacts would continue to not exceed the BAAQMD's cumulative thresholds. As such, there would be no significant cumulative impact from exposure to health risks associated with TACs.

For these reasons, the proposed project, in combination with other past, present, and reasonably foreseeable future projects, would not result in a significant cumulative impact. The cumulative impact would be ***less than significant with mitigation.***

Impact C-AQ-4: The proposed project in combination with past, present, and reasonably foreseeable future projects would not contribute to emissions (such as those leading to odors) adversely affecting a substantial number of people. *(Less than Significant)*

The project at 475 Eccles Avenue (Cumulative Project No. 16), which would involve new office/R&D buildings, is the only cumulative project located within 1,000 feet of the project site. These land uses are not commonly associated with odors and there are no sensitive receptors or odor-generating facilities within 1,000 feet of 475 Eccles Avenue. Construction of 475 Eccles Avenue would generate odors from diesel exhaust, asphalt paving, and the use of architectural coatings and solvents, but activities would be temporary and would not result in nuisance orders that would violate BAAQMD's Regulation 7. The project at 475 Eccles Avenue would not affect the operation of odor-generating facilities. In addition, as discussed under Impact AQ-4, the proposed project would not generate substantial odors. For these reasons, the proposed project, in combination with other past, present, and reasonably foreseeable future projects, would not result in a significant cumulative odor impact. The cumulative impact would be ***less than significant***. No mitigation is required.

4.3 Biological Resources

4.3.1 Introduction

This section describes the environmental and regulatory setting for biological resources. It also describes impacts associated with biological resources that would result from implementation of the proposed project and mitigation for significant impacts where feasible and appropriate.

4.3.2 Environmental Setting

The 7.4-acre project site is completely developed. It includes a six-story, approximately 170,235-square-foot office building at 701 Gateway Boulevard and surface parking lots with 558 parking spaces. The project site is bounded by a commercial and office building (901 Gateway Boulevard) and a surface parking lot to the north, Gateway Boulevard to the east, a surface parking lot to the south, and commercial and office buildings to the west. Landscaping on the project site is limited to trees and ornamental landscape features, such as parking and building buffers. The project site contains approximately 227 trees, including 35 protected trees.[1,2] The trees and buildings on or adjacent to the project site could provide nesting substrate for bird species. No sensitive natural communities, wetlands, streams, or other aquatic features are present on the project site.

The determination rationale regarding the potential for special-status species to occur within the biological resources study area[3] is discussed in Section 4.3.4.2, *Approach to Analysis*.

4.3.3 Regulatory Framework

4.3.3.1 Federal

Federal Endangered Species Act

The federal Endangered Species Act (FESA) (16 United States Code [USC], Section 1531 et seq.) designates threatened and endangered animal and plant species and provides measures for their protection and recovery. *Take* (i.e., to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct) of listed plant or wildlife species is prohibited without first obtaining a federal permit. The FESA also generally requires a determination of critical habitat for listed species. If critical habitat has been designated, impacts on areas that contain the primary constituent elements identified for the species, whether or not the species is currently present, are also prohibited. FESA Section 7 (for actions by federal agencies) and Section 10 (for actions by non-federal agencies) provide pathways for obtaining authority to take listed species.

---

1 Arborwell. 2020. *701 Gateway Boulevard Tree Inventory and Assessment, 701 Gateway Boulevard, South San Francisco, California*. February 12.

2 City of South San Francisco. n.d. *South San Francisco Municipal Code*. Chapter 13.30, Tree Preservation. Available: http://www.qcode.us/codes/southsanfrancisco/?view=desktop&topic=13-13_30-13_30_080. Accessed: March 25, 2020.

3 The biological resources study area varies depending on the type of resource (e.g., a one-mile radius from the project site, the 7.5-minute quadrangle in which the project site is located and the adjacent quadrangles, etc.).

Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA) (16 USC, Section 703, Supplement I, 1989) prohibits any attempt to take, kill, possess, sell, or trade migratory birds, except in accordance with regulations prescribed by the Secretary of the Interior. This act applies to whole birds, parts of birds, and bird nests and eggs. Although the MBTA itself does not provide specific take avoidance measures, the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW), over time, have developed measures regarding take avoidance with respect to nesting birds. These measures include avoiding vegetation removal or ground disturbance during the nesting season (typically February 15–September 15), conducting preconstruction nesting bird surveys in a project area during nesting season, and establishing appropriately sized protective buffers if active nests are found.

Federal Clean Water Act, Section 404

The Clean Water Act is the primary federal law that protects the quality of the nation's waters, including wetlands, lakes, rivers, and coastal areas. Section 404 of the Clean Water Act regulates the discharge of dredged or fill material into the waters of the United States, including wetlands. The Clean Water Act provides that all discharges into the nation's waters are unlawful unless specifically authorized by a permit; issuance of such permits constitutes its principal regulatory tool.

The U.S. Army Corps of Engineers (USACE) is authorized to issue Section 404 permits, which allow the placement of dredged or fill materials into jurisdictional waters of the United States under certain circumstances. The USACE issues two types of permits under Section 404: general permits, which are either nationwide permits or regional permits, and standard permits, which are either letters of permission or individual permits. General permits are issued by the USACE to streamline the Section 404 permitting process for nationwide, statewide, or regional activities that have minimal direct or cumulative environmental impacts on the aquatic environment. Standard permits are issued for activities that do not qualify for a general permit because they may have more than a minimal adverse environmental impact.

Federal Clean Water Act, Section 401

Under Clean Water Act Section 401, applicants for a federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the United States must obtain certification from the state in which the discharge would originate. Therefore, all projects that have a federal component and may affect state water quality, including projects that require federal agency approval, such as issuance of a Section 404 permit, must also comply with Clean Water Act Section 401 and the Porter-Cologne Water Quality Control Act (PCWQCA). In California, Section 401 certification is handled by the nine Regional Water Quality Control Boards (RWQCBs) and the State Water Resources Control Board (SWRCB). The City of South San Francisco falls under the jurisdiction of the San Francisco Bay RWQCB. The San Francisco Bay RWQCB must certify that the discharge will comply with State water quality standards and other requirements of the Clean Water Act.

4.3.3.2 State

California Endangered Species Act

Administered by the CDFW, the California Endangered Species Act (CESA) prohibits the take of listed species as well as species that are formally under consideration for listing in California, referred to as *candidate species*. Under the CESA, *take* means to "hunt, pursue, catch, capture, or kill or attempt to hunt, pursue, catch, capture, or kill" (California Fish and Game Code Section 86). Under this definition, in contrast to the FESA, the CESA does not prohibit harm to a listed species. Furthermore, take under the CESA does not include "the taking of habitat alone or the impacts of the taking." However, the killing of a listed species that is incidental to an otherwise lawful activity and not the primary purpose of the activity constitutes take under the CESA.

State Fish and Game Code, Section 1600–1616

The CDFW has jurisdictional authority over streams and lakes, as well as wetland resources associated with these aquatic systems, under California Fish and Game Code Section 1600 *et seq*. The CDFW has the authority to regulate work that will "substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake, or deposit or dispose of debris waste or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake" (California Fish and Game Code Section 1602.). An entity that proposes to carry out such an activity must first inform CDFW. Where CDFW concludes that the activity will "substantially adversely affect an existing (2014) fish or wildlife resource," the entity proposing the activity must negotiate an agreement with CDFW that specifies terms under which the activity may be carried out in a way that protects the affected wildlife resource.

Porter-Cologne Water Quality Control Act

California Water Code Section 13260 requires "any person discharging waste, or proposing to discharge waste, in any region that could affect the waters of the state to file a report of discharge (an application for waste discharge requirements)." Under the Porter-Cologne Water Quality Control Act (PCWQCA) definition, *waters of the state* are "any surface water or groundwater, including saline waters, within the boundaries of the state." Although all waters of the United States that are within the borders of California are also waters of the state, the reverse is not true. Accordingly, California retains authority to regulate discharges of waste into any waters of the state, regardless of whether USACE has concurrent jurisdiction under CWA Section 404. If USACE determines that a wetland is not subject to regulation under Section 404, CWA Section 401 water quality certification is not required. However, the RWQCB may impose waste discharge requirements (WDRs) if fill material is placed into waters of the state.

Waters of the State

Under the recent Wetland Riparian Area Protection Policy (May 28, 2020), RWQCBs will maintain jurisdiction over features excluded in the U.S. Environmental Protection Agency (EPA) and the Department of Army's Navigable Waters Protection Rule (NWPR). The newly adopted regulations (April 2, 2019) create a new statewide wetland definition that expands to features not previously covered under federal law and creates a new permitting program for activities that result in the discharge of dredged or fill materials to any waters of the state. The new rules are adopted under the state PCWQCA. Under the latter act, *waters of the state* are broadly defined as "[a]ny surface water or groundwater, including saline waters within state boundaries," including both natural and certain artificial or constructed facilities. Waters of the state include both waters of the United States and non-federal waters of the state.

California Native Plant Protection Act

The California Native Plant Protection Act of 1977 (CNPPA) prohibits the importation of rare and endangered plants into California, take of rare and endangered plants, and sale of rare and endangered plants. The CESA defers to the CNPPA, ensuring that state-listed plant species are protected when state agencies are involved in projects that are subject to CEQA. In this case, plants that are listed as rare under the CNPPA are not protected under the CESA but rather under CEQA.

California Fish and Game Code – Fully Protected Species

Certain species are considered fully protected, meaning that the California Fish and Game Code explicitly prohibits all take of individuals from these species, except for take permitted for scientific research. Fully protected amphibians and reptiles, fish, birds, and mammals are listed in Sections 5050, 5515, 3511, and 4700, respectively, of the California Fish and Game Code. It is possible for a species to be protected under the California Fish and Game Code but not be fully protected. For instance, the mountain lion (*Puma concolor*) is protected under Section 4800 et seq. but is not a fully protected species.

California Fish and Game Code – Protection of Birds and Their Nests

Under Section 3503 of the California Fish and Game Code, it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Section 3503.5 of the California Fish and Game Code prohibits take, possession, or destruction of any birds in the orders Falconiformes (hawks) or Strigiformes (owls) or of their nests and eggs. Migratory non-game birds are protected under Section 3513, whereas other specified birds are protected under Section 3800.

4.3.3.3 Local

South San Francisco General Plan

The City of South San Francisco (City) 1999 General Plan provides a vision for long-range physical and economic development of the City, provides strategies and specific implementing actions, and establishes a basis for judging whether specific development proposals and public projects are consistent with the City's plans and policy standards. The City General Plan contains an Open Space and Conservation Element, which outlines policies relating to habitat and biological resources, water quality, air quality, greenhouse gas emissions and historic and cultural resources conservation. The General Plan includes the following policies applicable to biological resources:

- Policy 7.1-G-1: Protect special-status species and supporting habitats within South San Francisco, including species that are state or federally listed as endangered, threatened, or rare.
- Policy 7.1-I-1: Cooperate with state and federal agencies to ensure that development does not substantially affect special-status species appearing on any state or federal list for any rare, endangered, or threatened species. Require assessments of biological resources prior to approval of any development on sites with ecologically sensitive habitat, as depicted in Figure 7-1.
- Policy 7.2-G-1: Comply with the San Francisco Bay Regional Water Quality Control Board regulations and standards to maintain and improve the quality of both surface water and groundwater resources.

- Policy 7.2-G-3: Discourage use of insecticides, herbicides, or toxic chemical substances within the City.
- Policy 7.2-I-1: Continue working with the San Francisco Bay Regional Water Quality Control Board in the implementation of the National Pollutant Discharge Elimination System and continue participation in the San Mateo Countywide Stormwater Pollution Prevention Program for the protection of surface water and groundwater quality.

South San Francisco Municipal Code

Chapter 13.30, *Tree Preservation,* of the South San Francisco Municipal Code concerns the preservation of trees for the health, welfare, and quality of life of the citizens of the City. Trees preserve the scenic beauty of the City, maintain ecological balance, prevent the erosion of topsoil, counteract air pollution and oxygenate the air, absorb noise, maintain a climatic and microclimatic balance, help block wind, and provide shade and color. The chapter is designed to:

- Provide standards and requirements for the protection of certain large trees (trees with a circumference of 48 inches or greater at 54 inches above the natural grade), heritage trees, as well as trees and stands with unique characteristics (having been so designated by the Parks and Recreation director);
- Provide standards and requirements for the planting and maintenance of trees for new development; and
- Establish recommended standards for the planting and maintaining of trees on property that is already developed.

The chapter achieves these objectives in ways that support and encourage reasonable economic enjoyment of private property, not in ways that prevent it (Ordinance 1271, Section 1 [part], 2000; Ordinance 1060, Section 1 [part], 1989).

According to South San Francisco Municipal Code Chapter 13.30, certain trees are subject to conditions before being removed, pruned, or otherwise materially altered. Protected trees include heritage trees and are defined by South San Francisco Municipal Code Chapter 13.30.020 as follows:

1. Any upright, single-trunked tree of a species not considered to be a heritage tree, as defined in Subsection 3, below, or listed in Subsection 2, below, with a circumference of 48 inches or more when measured 54 inches above natural grade; or
2. Any upright, single-trunked tree of the following species: blue gum (*Eucalyptus globulus*), black acacia (*Acacia melanoxylon*), myoporum (*Myoporum lactum*), sweetgum (*Liquidambar styraciflua*), glossy privet (*Lingustrum lucidum*), or Lombardy poplar (*Populus nigra*), with a circumference of 75 inches or more when measured 54 inches above natural grade; or
3. Any upright, single-trunked tree considered to be a heritage tree species, with a circumference of 30 inches or more when measured at 54 inches above natural grade. A heritage tree means any of the following: California bay (*Umbellaria californica*), oak (*Quercus* spp.), cedar (*Cedrus* spp.), California buckeye (*Aesculus californica*), Catalina ironwood (*Lyonothamnus asplenifolium*), strawberry tree (*Arbutus* spp.), mayten (*Maytenus boaria*), or little gem dwarf southern magnolia (*Magnolia grandiflora*, “Little Gem”).

4. A tree or stand of trees so designated by the director, based upon findings that it is unique and of importance to the public due to its unusual appearance, location, historical significance, or other factor; or
5. A stand of trees in which the director has determined each tree is dependent upon the others for survival.

Protected trees cannot be removed or pruned without a permit from the City and must be protected from development-related impacts such as soil compaction and underground trenching for utilities. In addition, new developments must conform to a series of tree planting requirements.

Gateway Specific Plan

The Gateway Specific Plan covers the portion of the East of 101 Area Plan from east of the Caltrain tracks to the eastern boundary of the parcels along the east side of Gateway Boulevard and the area between Oyster Point Boulevard and Grand Avenue on the northern and southern boundaries. The Specific Plan is "intended to provide for various commercial and research and development land uses integrated by consistent development standards." The Gateway Specific Plan includes the following construction standards and open space standards applicable to biological resources:

- Construction Standard 1(f): Protection of Trees. Construction vehicles and equipment and excavated soils shall be kept away from under the canopy of any trees on the Site which are to be preserved.
- Construction Standard 3(a)-(f): In general, to be approved, landscaping plans ordinarily must provide for the following:
  a. Completion of landscaping on the Site contemporaneously with completion of the Building and other Improvements on the Site;
  b. Automatic underground sprinkling systems for all landscaped areas;
  c. Landscaping which does not obstruct sight lines at street or driveway intersections;
  d. Preservation of existing trees to the extent practical;
  e. At least one (1) tree for each 2,000 square feet of area between Building lines and street Property Lines with the exception of paved areas and parking islands;
  f. Reasonable access to public and private utility lines and easements for installation and repair.
- Open Space Standards. Open space areas shall be conserved, designed and developed to enhance the environmental quality of the Site and to achieve safe, efficient and harmonious development of the Site.

East of 101 Area Plan

The *East of 101 Area Plan*, which was adopted in 1994 and most recently amended in 2016, sets forth specific land use policies for the East of 101 Area. The City interprets the *East of 101 Area Plan* as a design-level document. Per Policy IM-5, the Gateway Specific Plan is not affected by the land use regulations of the East of 101 Area Plan. Therefore, the policies set forth in the General

Plan are the guiding policies and supersede all Conservation Element policies set forth in Chapter 11 of the *East of 101 Area Plan*. Nonetheless, the *East of 101 Area Plan* contains the following policies applicable to biological resources:

- Policy CON-4: The City shall take all feasible measures to preserve any sensitive plant and animal species that occur in the East of 101 Area.
- Policy CON-5: Prior to receiving approval for construction activities or other disturbances on undeveloped land in the East of 101 Area project sponsors shall conduct environmental analyses to evaluate the site-specific status of sensitive plant and animal species.
- Policy CON-6: If sensitive plant or animal species would be unavoidably affected by a proposed project the City shall require the project developer to implement appropriate mitigation measures.
- Policy CON-7: New development adjacent to sensitive resource areas shall be required to incorporate the following measures into the project design:
  - Shield lights to reduce offsite glare.
  - Provide buffer areas of at least 100 feet between known sensitive resources and the development area.
  - Landscape all onsite buffer areas with native vegetation to screen habitat areas from adjacent land uses.
  - Restrict entry to habitat areas through devices such as fencing, landscaping, or signage.
  - Ensure that runoff from development does not adversely affect the biotic values of adjacent wetlands or other habitat areas.

4.3.4 Impacts and Mitigation Measures

4.3.4.1 Significance Criteria

Based on Appendix G of the CEQA Guidelines, the proposed project would have a significant biological resources impact if it would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service;
- 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;
- Have a substantial adverse effect on state or federally protected wetlands, including, but not limited to, marsh, vernal pool, coastal areas, etc., through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.

4.3.4.2 Approach to Analysis

Evaluation of the proposed project is based on a desktop review of the following sources:

- California Natural Diversity Database[4] (CNDDB) species list query for a 1-mile buffer around the project site;
- California Native Plant Society[5] species list query for the U.S. Geological Survey (USGS) South San Francisco (3712264), Hunters Point (3712263), Montara Mountain (3712254), and San Mateo (3712253) 7.5-minute quadrangles;
- USFWS[6] Information for Planning and Consultation (IPaC) query of the project site;
- Arborwell 701 Gateway Boulevard Tree Inventory and Assessment;[7]
- City of South San Francisco General Plan;[8]
- National Wetland Inventory and U.S. Environmental Protection Agency (EPA) for the identification of waters and wetlands, using existing water/wetland inventory data;[9,10] and
- Aerial imagery from Google Earth.[11]

4.3.4.3 Impact Evaluation

Impact BIO-1: The proposed project would not 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. (*Less than Significant with Mitigation*)

The project site and surrounding area are characterized by dense urban development and are void of natural land cover or communities. Special-status species that have the potential to occur on the project site or in the surrounding area include the pallid bat (*Antrozous pallidus*) and peregrine falcon (*Falco peregrinus*).

---

4 California Department of Fish and Wildlife. 2020. *California Natural Diversity Database RareFind Records Search.* RareFind Version 5. Available: https://www.wildlife.ca.gov/Data/CNDDB/Maps-and-Data. Accessed: March 24, 2020.

5 California Native Plant Society. 2019. *Online Inventory of Rare and Endangered Plants of California*. Available: http://cnps.site.aplus.net/cgi-bin/inv/inventory.cgi/Html?item=checkbox_9.htm. Accessed: March 24, 2020.

6 U.S. Fish and Wildlife Service. 2019. *IPaC Species List.* Available: https://ecos.fws.gov/ipac/. Accessed: March 24, 2020.

7 Arborwell. 2020. *701 Gateway Boulevard Tree Inventory and Assessment.* Prepared for Alexandria Real Estate Equities, Inc., San Francisco, CA.

8 City of South San Francisco. 1999. *City of South San Francisco General Plan, Chapter 7: Open Space and Conservation Element.* Available: https://www.ssf.net/departments/economic-community-development/planning-division/general-plan. Accessed: March 25, 2020.

9 U.S. Fish and Wildlife Service. 2019. *National Wetland Inventory*. October 8. Available: https://www.fws.gov/wetlands/data/Mapper.html. Accessed: March 25, 2020.

10 U.S. Environmental Protection Agency. 2020. *WATERS GeoViewer*. Available: https://www.epa.gov/waterdata/waters-geoviewer. Accessed: March 24, 2020.

11 Google Earth Pro. 2018. Online research, 751 Gateway Boulevard, 37.660400°N and -122.397050°W. Available: https://www.google.com/earth/versions/#earth-pro. Accessed: March 24, 2020.

Pallid bat is designated as a species of special concern by CDFW. Suitable foraging habitat is open, natural land cover such as grasslands, shrublands, woodlands, and forests. For roosting, pallid bat prefers rocky outcrops, cliffs, and crevices with access to open habitats for foraging. Day roosts are in caves, crevices, mines, and occasionally in hollow trees and buildings; night roosts may be in more open sites, such as porches and open buildings. Roosts must protect bats from high temperatures, and pallid bats are very sensitive to disturbance of roosting sites.[12] Although pallid bat may forage over the project area on occasion, the project site does not provide suitable foraging or roosting habitat for the species. Due to the marginal roosting habitat, lack of foraging habitat, and high level of disturbance, it is considered unlikely that pallid bat would be present at the project site. There are no recent CNDDB occurrences of pallid bat in San Mateo County and no CNDDB occurrences of pallid bat in nearby San Francisco County. The nearest CNDDB occurrence for pallid bat (occurrence #294) is from 1947 and located approximately 3.2 miles south of the project site. Therefore, impacts on pallid bat foraging habitat are not likely, and the impact on pallid bat would be ***less than significant***.

Peregrine falcon is designated as fully protected by CDFW. Peregrine falcons normally nest in a scrape on a cliff ledge, but will also nest in snags or large vacant nests in trees and on structure ledges including buildings; pigeons are often favored prey around cities.[13] Although nesting habitat onsite is marginal due to the moderate stature of the existing on-site trees and the six-story[14] existing building on the project site, the buildings and trees within and surrounding the project site may provide suitable nesting and roosting habitat for this species. Additionally, open-air space in and around the project site provides foraging habitat if prey is present. The nearest CNDDB occurrence for peregrine falcon (occurrence #55) was in 2014. Although CNDDB does not disclose the exact location of the occurrence, the size of the occurrence area is approximately 8 square miles and it includes the project site. The CNDDB occurrence indicates the nest was located on the side of a hangar, which is a structure typically at an airport. Thus, it is presumed the occurrence was approximately two miles south of the project site at San Francisco International Airport. Nonetheless, if nests of this species are present on-site or in the surrounding area, and eggs, nestlings, or nesting individuals are harmed or killed during tree removal or substantially affected by construction noise or nighttime lighting during operation, a ***significant*** impact would occur.

On-site buildings and landscaped areas may also provide suitable nesting habitat for resident and migratory birds that are protected by state (California Fish and Game Code Sections 3503 and 3513) and federal (MBTA) laws. If the project is implemented during the nesting season (February 15–September 15), tree removal and construction associated with the project could impact active nests, resulting in take (i.e., direct mortality of adult or young birds, the destruction of active nests, disturbance of nesting adults, with associated nest abandonment and/or loss of reproductive effort), which would be a ***significant*** impact.

---

[12] Harris, J. 2008. Life history account for Pallid Bat. California Wildlife Habitat Relationships (CWHR) Version 9.0. California Department of Fish and Game and California Interagency Wildlife Task Group. . Available from: http://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=2349 Accessed: July 28, 2020. . Accessed July 28, 2020.

[13] National Audubon Society, 2018. Guide to North American Birds –Peregrine Falcon (website). Available online at: https://www.audubon.org/field-guide/bird/peregrine-falcon. Accessed July 21, 2020.

[14] The six-story building within the project site is considered to be of moderate stature because peregrine falcons have only been documented to nest on a 33-story building in the City of San Francisco.

Implementation of Mitigation Measure BI-1, Preconstruction Nesting Bird Surveys and Buffer Areas, would reduce potential impacts on peregrine falcon and other nesting birds covered under the California Fish and Game Code and MBTA to ***less than significant with mitigation*** by ensuring that project activities would not affect nesting special-status species or other resident or migratory birds.

Mitigation Measure BI-1: Preconstuction Nesting Bird Surveys and Buffer Areas

The project sponsor shall protect nesting birds and their nests during construction by implementation of the following measures:

a. To the extent feasible, conduct initial activities, including, but not limited to, vegetation removal, tree trimming or removal, ground disturbance, building or parking lot demolition, site grading, and other construction activities which may compromise breeding birds or the success of their nests outside the nesting season (February 15–September 15).

b. If construction occurs during the bird nesting season, a qualified wildlife biologist* shall conduct a nesting bird preconstruction survey within 14 days prior to the start of construction or demolition at areas that have not been previously disturbed by project activities or after any construction breaks of 14 days or more. The survey shall be performed within 100 feet of the applicable construction phase area in order to locate any active nests of passerine species and within 300 feet of the applicable construction phase area to locate any active raptor (birds of prey) nests, and this survey shall be of those areas that constitute suitable habitat for these species.

c. If active nests are located during the preconstruction nesting bird survey, a qualified biologist shall determine if the schedule of construction activities could affect the active nests; if so, the following measures would apply:

    1. If the qualified biologist determines that construction is not likely to affect an active nest, construction may proceed without restriction; however, a qualified biologist shall regularly monitor the nest at a frequency determined appropriate for the surrounding construction activity to confirm there is no adverse effect. Spot-check monitoring frequency would be determined on a nest-by-nest basis, considering the particular construction activity, duration, proximity to the nest, and physical barriers that may screen activity from the nest.

    2. If it is determined that construction may cause abandonment of an active nest, the qualified biologist shall establish a no-disturbance buffer around the nest(s), and all project work shall halt within the buffer to avoid disturbance or destruction until a qualified biologist determines that the nest is no longer active. Typically, buffer distances are 100 feet for passerines and 300 feet for raptors; however. the buffers may be shortened if an obstruction, such as a building, is within line-of-sight between the nest and construction.

    3. Modifying nest buffer distances, allowing certain construction activities within the buffer, and/or modifying construction methods in proximity to active nests shall be approved by the qualified biologist and in coordination with the Planning Division. To the extent necessary to remove or relocate an active nest, such removal or relocation shall be coordinated with the Planning Division, and the removal or relocation shall be in compliance with the California Fish and Game Code and other applicable laws.

4. Any work that must occur within established no-disturbance buffers around active nests shall be monitored by a qualified biologist. If adverse effects in response to project work within the buffer are observed and could compromise the nest, work within the no-disturbance buffer(s) shall halt until the nest occupants have fledged.
5. Any birds that begin nesting within the project area and survey buffers amid construction activities are assumed to be habituated to construction-related or similar noise and disturbance levels. Work may proceed around these active nests subject to Measure c.2 above.

* The experience requirements for a "qualified biologist" shall include a minimum of 4 years of academic training and professional experience in biological sciences and related resource management activities, and a minimum of 2 years of experience conducting surveys for each species that may be present within the project area.

Impact BIO-2: The proposed project would not 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. (*No Impact*)

The project site and surrounding area are completely developed, composed entirely of commercial and office buildings that are interspersed with turf areas and landscaping as well as paved parking lots, sidewalks, and surface streets. No riparian habitat or other sensitive natural community is present on the project site or in the immediate vicinity. The existing on-site ornamental vegetation is not a sensitive natural community. Colma Creek, located approximately 0.7 mile southwest of the project site, is concrete lined and has little to no riparian habitat. The proposed Project would not result in any impacts to this feature. The closest areas with potential for sensitive natural communities include the shoreline of San Francisco Bay and San Bruno Mountain State and County Park, approximately 0.2 mile northeast and 0.3 mile northwest of the project site, respectively. The proposed project would have no effect on these areas because of their respective distances from the project site. Therefore, the project would have ***no impact.*** No mitigation is required.

Impact BIO-3: The proposed project would not have a substantial adverse effect on state or federally protected wetlands, including, but not limited to, marsh, vernal pool, coastal areas, etc., through direct removal, filling, hydrological interruption, or other means. (*No Impact*)

No federally protected wetlands or other jurisdictional waters are present on the project site or in the immediate vicinity. The nearest federally protected wetlands in proximity to the project site are the riverine habitat located approximately 0.2 mile north of the project site, along the east side of U.S. 101, and the estuarine and marine deep-water habitat located approximately 0.2 mile northeast of the project site, which is associated with San Francisco Bay.[15] The project site is separated from these features by dense urban development, including multiple paved roads. Therefore, the proposed project would have ***no impact*** on state or federally protected wetlands. No mitigation is required.

---

[15] U.S. Fish and Wildlife Service. 2019. *National Wetland Inventory.* October 8. Available: https://www.fws.gov/wetlands/Data/Data-Download.html/. Accessed: March 25, 2020.

Impact BIO-4: The proposed project 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. (*Less than Significant with Mitigation*)

No wetlands or running waters are present in the vicinity of the project site; therefore, the project would have no impact on the movement of fish species. As discussed above under Impact BIO-1, existing structures and trees on the project site could provide nesting habitat for resident and migratory birds, therefore, the project has the potential to affect a native wildlife nursery site, which would be a ***significant*** impact. Implementation of Mitigation Measure BI-1, Preconstruction Nesting Bird Surveys and Buffer Areas would reduce this impact to ***less than significant with mitigation*** by ensuring that project activities would not impede the use of native wildlife nursery sites.

Wildlife corridors are described as pathways or habitat linkages that connect discrete areas of natural open space that would otherwise be separated or fragmented by topography, changes in vegetation, or natural or man-made obstacles, such as urbanization. Because the project site and surrounding area are developed, it does not connect directly to areas of natural open space. Any common urban-adapted species that currently move through the project site would continue to be able to do so following project construction. Nonetheless, the likelihood exists for trees on the project site to be used by migratory birds because of the site's location along the Pacific Flyway and proximity to San Bruno Mountain and San Francisco Bay. A potentially significant impact would occur if a substantial number of nesting migratory birds were injured or killed during construction or operation of the project. Implementation of Mitigation Measure BI-1, Preconstruction Nesting Bird Surveys and Buffer Areas would reduce potential impacts on nesting migratory birds covered under the California Fish and Game Code and MBTA to ***less than significant with mitigation*** by ensuring that project activities would not affect nesting migratory birds.

Operation of the proposed project would include the use of new lighting and a new 148-foot-tall, seven-story building with potentially reflective surfaces. The new lighting and new surfaces could misdirect or confuse migratory birds, resulting in disruption of natural behavioral patterns and possible injury or death from exhaustion or collisions with buildings, which would be a ***significant*** impact. The potential for these types of impacts could be heightened because of the project site's proximity to San Bruno Mountain and San Francisco Bay. Implementation of Mitigation Measures BI-3, Lighting Measures to Reduce Impacts on Birds, and BI-4b, Building Design Measures to Minimize Bird Strike Risk would reduce impacts on the movement of native resident or migratory wildlife species to ***less than significant with mitigation*** by ensuring that project activities would not affect migratory birds.

Mitigation Measure BI-2: Lighting Measures to Reduce Impacts on Birds

During design, the project sponsor shall ensure that a qualified biologist experienced with bird strikes and building/lighting design issues shall identify lighting-related measures to minimize the effects of the building's lighting on birds. The project sponsor shall incorporate such measures, which may include the following and/or other measures, into the building's design and operation.

a. Use strobe or flashing lights in place of continuously burning lights for obstruction lighting. Use flashing white lights rather than continuous light, red light, or rotating beams.

b. Install shields onto light sources not necessary for air traffic to direct light towards the ground.

c. Extinguish all exterior lighting (i.e., rooftop floods, perimeter spots) not required for public safety.

d. When interior or exterior lights must be left on at night, the operator of the buildings shall examine and adopt alternatives to bright, all-night, floor-wide lighting, which may include installing motion-sensitive lighting, using desk lamps and task lighting, reprogramming timers, or using lower-intensity lighting.

e. Windows or window treatments that reduce transmission of light out of the building shall be implemented to the extent feasible.

Mitigation Measure BI-3: Building Design Measures to Minimize Bird Strike Risk

During design, the project sponsor shall ensure that a qualified biologist experienced with bird strikes and building/lighting design issues shall identify measures related to the external appearance of the building to minimize the risk of bird strikes. The project sponsor shall incorporate such measures, which may include the following and/or other measures, into the building's design.

a. Minimize the extent of glazing.

b. Use low-reflective glass and/or patterned or fritted glass.

c. Use window films, mullions, blinds, or other internal or external features to "break up" reflective surfaces rather than having large, uninterrupted areas of surfaces that reflect, and thus to a bird may not appear noticeably different from, vegetation or the sky.

Impact BIO-5: The proposed project would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. (*Less than Significant*)

Local policies and ordinaces for protecting biological resources include the Tree Preservation Ordinance (Chapter 13.30) in the City of South San Francisco Municipal Code. A tree inventory and assessment of the project site was performed by Arborwell in January 2020. A total of 227 trees were documented on the project site, 35 of which are protected under this ordinance. The proposed project would require the removal of 175 trees on the project site, including four protected trees. The project sponsor would be required to abide by all conditions specified in the City Municipal Code which requires that the project sponsor obtain permits to remove protected trees and to compensate for their removal by planting replacement trees of certain sizes and species as specified in the City Municipal Code and by the Parks and Recreation director. Therefore, the project would comply with local policies and ordinances for protecting biological resources, such as a tree preservation policy or ordinance, ensuring that project activities would not result in an unauthorized impact on a protected tree. This impact would be ***less than significant***.

Impact BIO-6: The proposed project would not conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan. (*No Impact*)

The project site is not part of an existing habitat conservation plan or natural community conservation plan or any other local, regional, or state habitat conservation plan. Therefore, the project would have ***no impact*** on the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat. No mitigation is required.

4.3.4.4 Cumulative Impacts

Impact C-BIO-1: The proposed project would not result in a cumulatively considerable contribution to significant cumulative impacts on biological resources. (*Less than Significant with Mitigation*)

The proposed project would not modify any natural habitat and would have no impact on sensitive natural communities, including riparian habitat; protected wetlands; the movement of native resident or migratory fish species; or an approved conservation plan. The cumulative geographic context for biological resources is the immediate vicinity of the project site, which is the area where construction activities, including tree removal, could affect biological resources including nesting special-status and migratory bird species, and protected trees that may be present on or near the site. The cumulative projects located within approximately 0.5 mile of the project site are described in Section 4.1.5, *Approach to Cumulative Impact Analysis*, of this draft EIR and shown in Figure 4.1-1.

Similar to the project site, the majority of the sites for cumulative projects contain development with ornamental landscaping and ruderal vegetation; therefore, habitat for candidate, sensitive, or special-status species is marginal. Most of the future projects would involve primarily the construction of new buildings or modifications to existing buildings or infrastructure, and associated tree removals. Therefore, as with the proposed project, such development could have an impact on nesting special-status and migratory bird species, the movement of native resident or migratory wildlife species, established native resident or migratory wildlife corridors, the use of native wildlife nursery sites, and local policies or ordinances for protecting biological resources. Cumulative impacts on these biological resources could be ***significant*** because reasonably foreseeable projects would affect or remove additional structures and trees and erect new structures. Structures and trees provide roosting and nesting habitat for special-status and migratory birds and act as potential nursery sites; new structures could affect the movement of species. However, these future projects would also be subject to the requirements of the wildlife protection laws, including CESA, MBTA, and the California Fish and Game Code, as well as wildlife protection policies and provisions in the City General Plan and the City Municipal Code, Chapter 13.30. Nonetheless, cumulative impacts on these biological resources would be ***significant*** because reasonably foreseeable projects could affect or remove a substantial number of structures and trees and erect new structures.

The project would remove 175 trees on the project site and construct a new 148-foot-tall, seven-story building. Implementation of Mitigation Measure BI-1, Preconstruction Nesting Bird Surveys and Buffer Areas; Mitigation Measure BI-2, Lighting Measures to Reduce Impacts on Birds; and Mitigation Measure BI-3, Building Design Measures to Minimize Bird Strike Risk, would require pre-construction surveys for nesting birds, and building design measures to minimize lighting effects on birds and bird strike risk. Implementation of these mitigation measures would ensure that the proposed project's contribution to cumulative impacts on nesting special-status and migratory bird species, the movement of native resident or migratory wildlife species, established native resident or migratory wildlife corridors, the use of native wildlife nursery sites, and local policies or ordinances for protecting biological resources would be ***less than cumulatively considerable***.

4.4 Cultural Resources

4.4.1 Introduction

This section describes the environmental and regulatory setting for cultural resources and tribal cultural resources. It also describes impacts associated with cultural resources and tribal cultural resources that would result from implementation of the proposed project and mitigation for significant impacts where feasible and appropriate.

4.4.2 Environmental Setting

4.4.2.1 Prehistoric Context

Summaries of the cultural chronologies of the Bay Area have divided the prehistoric cultural sequence into multiple phases or periods, which are delineated by changes in regional patterns of land use, subsistence, and tool types over time. The most recent chronologies encompass a time period that ranges from around 13,500 calibrated years before present (cal BP) to around 170 cal BP. The early periods of this section's chronology are based on research from along the California coast,[1,2] while the later periods of this chronology are based on time periods that were recently proposed by Groza et al.,[3] with additional information integrated from the other chronologies mentioned above. The sequence incudes four periods. Importantly, these periods are academic constructs and do not necessarily reflect Native American viewpoints.

This summary presents the prehistory of the Bay Area by the geologic time segment.

Terminal Pleistocene (13,500–11,600 cal BP)

Traditionally, it was thought that the earliest human inhabitants of North America were highly mobile terrestrial hunters. Commonly referred to as the Clovis, these people used intricate bone and stone technology. On the western coast of North America, Clovis assemblages are characterized by a wide but sparse distribution of isolated tools and caches, which have been dated to between 12,800 and 12,500 cal BP. However, over the last few decades, along the western coasts of North and South America, several archaeological sites and sets of human remains have been documented in island and mainland coastal contexts that date to the same period as the Clovis. These discoveries have forced researchers to reconsider how early humans migrated to the Americas and their land use strategies, with a greater emphasis placed on coastal environments.

Early Holocene (11,600–7700 cal BP)

The Early Holocene landscape of Central California is characterized by semi-mobile hunter-gatherers who exploited a wide range of food resources from marine, lacustrine, and terrestrial contexts.

1 Rick, T.C., J.M. Erlandson, R.L., Vellanoweth. 2001. Paleocoastal Marine Fishing on the Pacific Coast of the Americas: Perspectives from Daisy Cave, California. In *American Antiquity* 66(4). Pp. 595-613.

2 Erlandson, Rick, T.C., Jones, T., Porcasi, J.F. One if by Land, Two if by Sea: Who Were the First Californians? In *California Prehistory: Colonization, Culture, and Complexity.* Pp. 53-62. AltaMira Press. Lanham, Maryland

3 Groza, R.G., J. Rosenthal, J. Southon, R. Milliken. 2011. A Refined Shell Bead Chronology for Late Holocene Central California. *Journal of California and Great Basin Anthropology* 31(2). Pp. 135-154.

Middle Holocene (7700–3800 cal BP)

The Middle Holocene is characterized by a diverse range of habitation sites and artifact assemblages, which suggest higher population levels, more complex adaptive strategies, and longer seasonal occupations than those of the Early Holocene. The presence of seasonal waterfowl within assemblages dated to the Middle Holocene suggests more diverse, local niche-based exploitation strategies.

Late Holocene (3800–170 cal BP)

There are more than 200 documented Late Holocene sites in the Bay Area. The beginning of the Late Holocene is marked by the establishment of a number of large shell mounds. Sites of this type are present within 0.25 miles of the project area.

Middle Period of the Late Holocene (2050–900 cal BP)

The Middle Period of the Late Holocene is characterized by greater settlement permanence (either sedentary or multi-season occupation), mound building, and social complexity and ritual elaboration.

Late Period of the Late Holocene (700–170 cal BP)

The Late Period of the Late Holocene is the best-documented Late Holocene division in the greater Bay Area. Small seed exploitation increased, as evidenced by archaeobotanical remains, and sea otters, rabbits, deer, clams, and horn snails were frequently exploited as foodstuffs. The bow and arrow first appeared during the Late Period, and extensive trade relations with neighboring groups continued.

4.4.2.2 Historic Context

Spanish colonization of what is now California began in the late 1700s. It was based around a system of missions that intended to convert the native peoples to Catholicism, gain control of the native population, and create economically self-sufficient colonial communities. When Mexico won its independence from Spain in 1824, one of the first acts of the new government was to secularize the missions and redistribute the mission land holdings in the form of land grants to individuals who promised to work the land, primarily by raising cattle.[4]

In 1848, the United States won the Mexican-American War and, as a result, gained approximately 50 percent of Mexico's territory, including what would become the state of California. Within weeks of the end of the war, gold was discovered in the Sierra Nevada foothills, and by the summer of 1849, thousands of people were arriving in California in search of their fortunes.

After most of the Mexican land grants were judged invalid, the land was subject to sale, opening large areas to new ownership and initiating a shift to farming to supply the growing demand for fresh food. In the South Bay, a combination of wheat and barley production, dairy farms, and orchards dominated the valley floor from the 1860s until the late 1870s.

By the 1890s, orchard production was the dominant agricultural activity in the valley; it remained in that position through the 1940s. In the late nineteenth century, Leland Stanford, Sr., established the Palo Alto Stock Farm on his 8,650 acres of land along San Francisquito Creek. In 1891, he founded

[4] Rawls, J.J. and W. Bean. 2003. *California: An Interpretive History*. McGraw Hill. Boston, Massachusetts.

Stanford University on this land. The population in the region grew substantially during the early twentieth century. Palo Alto expanded significantly, eventually incorporating Mayfield and Stanford University by the early part of World War II.[5] Following World War II, the growth of light industry and high-tech R&D, coupled with expanding suburbanization, gradually eroded the valley's orchards.

4.4.2.3 Ethnographic Context

The project site is on the cusp of what was traditionally the Lamchin territory, north of the border of the Puichon territory.[6] Both the Lamchin and the Puichon spoke the Ramaytush dialect of Costanoan. The Costanoan languages are part of the larger Utian language family, which is part of a larger language family, the Penutian language, with languages and dialects spoken by groups of Native Americans across California, Oregon, and Washington.[7] The territory of the Ohlone people, who were referred to as the Costanoans by the Spanish because they lived along the coast, extended from the Golden Gate to just below Carmel as well as through several valleys that led inland from the coastline.[8]

As with other Ohlone tribelets, the Lamchin and Puichon were primarily hunters and gatherers. They hunted terrestrial game such as mule deer, tule elk, pronged antelope, and mountain lion. Traps were set for smaller game such as rabbit and quail. Marine resources were hunted along the shores, including sea lions and whales, which were prized for their blubber. Water fowl were a very important part of the tribal diet and trapped along the tidal marshes. Other marine resources, such as salmon, steelhead, school fish, and shellfish, including mussels, were collected and were a major dietary staple. Tule boats were used to collect both saltwater and freshwater marine resources.

The Ohlone also used a wide range of other foods, including various seeds (the growth of which was promoted by controlled burning), buckeye, berries, roots, acorns, nuts, fruits, land and sea mammals, water fowl, reptiles, and insects. The Ohlone used tule balsas for watercraft, bows and arrows, cordage, and bone and ground-stone tools to procure and process their foodstuffs.[9,10]

The Ohlone were politically organized by tribelet, with each having a designated territory. A territory consisted of one or more villages and camps designated by physiographic features. Each tribelet consisted of several households, which averaged from 10 to 15 individuals and were grouped into clans and moieties. Primary sources describe tribelets as small groups of people, averaging 60 to 90 individuals, which were located 3 to 5 miles apart. These groups within a territory were often linked by marriage. The office of tribelet chief, which was inherited patrilineally, could be occupied by a man or a woman. If there was no son to inherit the position, a

---

5 Byrd, Brian F. and Jack Meyer. 2011. Initial Cultural Resources Investigation San Francisquito Creek Flood Damage Reduction and Ecosystem Restoration Project, Santa Clara and San Mateo Counties, California. Prepared by Far Western Anthropological Research Group. Prepared for Santa Clara Valley Water District.

6 Milliken, R. 1995*. A Time of Little Choice: The Disintegration of Tribal Culture in the San Francisco Bay Area 1769-1810.* Ballena Press. Novato, CA.

7 Callaghan, C.A. 1967. Miwok-Costanoan as a Subfamily of Penutian. *International Journal of American Linguistics* 33(3) Pp. 224-227.

8 Levy, R. 1978. Costanoan. In *The Handbook of North American Indians Volume 8: California.* Heizer, R.F., Editor. Pp. 485-493. Smithsonian Institution. Washington, D.C.

9 Krober, A.L. 1925. *Handbook of the Indians of California*. Dover Press. New York, New York.

10 Milliken, R. 1995. *A Time of Little Choice: The Disintegration of Tribal Culture in the San Francisco Bay Area 1769-1810.* Ballena Press. Novato, CA.

sister or daughter would assume the position. Duties of the chief included providing for visitors, directing ceremonial activities, and leading fishing, hunting, gathering, and warfare expeditions. The chief served as the leader of a council of elders, which functioned primarily in an advisory capacity to the community.

As stated above, a single tribelet, comprising patrilineal family groups, would occupy a village location at different times of the year. Ohlone villages in the Late Period of the Late Holocene typically had four types of structures. Dwellings were generally domed structures with central hearths. They were thatched with tule, grass, or other vegetal material and bound with willow withes. Permanent settlements were usually placed away from the ocean shore, on high ground. Sweathouses were used by men and women and usually located along streambanks. A sweathouse consisted of a pit that was excavated into the streambank, with a thatched portion constructed against the bank. Dance structures were circular or oval in plan and enclosed by a woven fence of brush or laurel branches and stood approximately 5 feet. These structures would have one main doorway, with a smaller opening directly opposite. The assembly house was a thatched dome structure that was large enough to accommodate all of the inhabitants of the village.[11]

Although they have yet to receive formal recognition from the federal government, the Ohlone are becoming increasingly organized as a political unit and have developed an active interest in preserving their ancestral heritage. In the later part of the twentieth century, the Galvan family of Mission San José worked closely with the American Indian Historical Society and successfully prevented destruction of a mission cemetery that was in the path of a proposed freeway. These descendants incorporated as the Ohlone Indian Tribe and now hold title to the Ohlone Indian Cemetery in Fremont.[12] The descendants are active in maintaining their traditions and advocating for Native American issues.

4.4.3 Regulatory Framework

4.4.3.1 State

Cultural Resources

State Historic Significance Criteria

The CEQA Guidelines provide three ways for a cultural resource to qualify as a historical resource for the purposes of CEQA:

1. The resource is listed in, or determined eligible for listing in, the California Register of Historical Resources (CRHR).
2. The resource is included in a local register of historical resources, as defined in PRC Section 5020.1(k), or identified as significant in a historical resource survey meeting the requirements of PRC Section 5024.1(g), unless the preponderance of evidence demonstrates that it is not historically or culturally significant.
3. The lead agency determines the resource to be significant, as supported by substantial evidence in light of the whole record (14 California Code of Regulations [CCR] Section 15064.5[a]).

[11] Crespi, J. 1927. Manuscripts of Friar Juan Crespi. University of California Press. Berkeley, California.

[12] Bean, L.J. 1994. *The Ohlone Past and Present: Native Americans of the San Francisco Bay Region.* Ballena Press. Novato, California.

For a historical resource to be eligible for listing in the CRHR, it must be significant at the local, state, or national level under one or more of the following criteria from Public Resources Code Section 5024.1(c):

1. The resource is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
2. The resource is associated with the lives of persons important in our past.
3. The resource embodies the distinctive characteristics of a type, period, region, or method of construction; represents the work of an important creative individual; or possesses high artistic values.
4. The resource has yielded, or may be likely to yield, information important in prehistory or history.

Historical resources automatically listed in the CRHR include those historic properties listed in, or formally determined to be eligible for listing in, the National Register of Historic Places (NRHP) (PRC Section 5024.1). In addition, CEQA distinguishes between two classes of archaeological resources: archaeological sites that meet the definition of a historical resource, as defined above, and unique archaeological resources.

An archaeological resource is considered unique if it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information;
- Has a special and particular quality, such as being the oldest of its type or the best available example of its type; or
- Is directly associated with a scientifically recognized important prehistoric or historic event or person (PRC Section 21083.2).

Resources that qualify as unique archaeological resources also typically meet at least one of the CRHR criteria. For the purposes of this project, significant cultural resources, as defined by CEQA, are those resources that meet at least one of the CRHR eligibility criteria or are unique archeological resources. Notably, a project that causes a substantial adverse change in the significance of a historical resource is a project that may have significant impact under CEQA (14 CCR Section 15064.5[b]). A substantial adverse change in the significance of an historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the historical resource is materially impaired.

The significance of a historical resource is materially impaired if a project demolishes or materially alters any qualities that justify:

- Inclusion in, or eligibility for inclusion in, the CRHR (14 CCR Section 15064.5[b][2][A],[C]).
- Inclusion in a local register (14 CCR Section 15064.5[b][2][B]).

Tribal Cultural Resources

Assembly Bill 52

Tribal cultural resources were originally identified as a distinct CEQA environmental category with the adoption of Assembly Bill 52 (AB 52) in September 2014. For all projects that are subject to CEQA that received a notice of preparation, notice of negative declaration, or mitigated negative declaration on or after July 1, 2015, AB 52 requires the lead agency on a proposed project to consult with the geographically affiliated California Native American tribes. The legislation creates a broad new category of environmental resources, "tribal cultural resources," which must be considered under CEQA. AB 52 requires a lead agency to not only consider the resource's scientific and historical value but also whether it is culturally important to a California Native American tribe.

AB 52 defines tribal cultural resources as sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are included or determined to be eligible for inclusion in the CRHR; included in a local register of historical resources, as defined in Public Resources Code Section 5020.1(k); or determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to the criteria of Public Resources Code Section 5024.1(c) (CEQA Section 21074).

The CRHR criteria for the listing of resources, as defined in Public Resources Code Section 5024.1(c), are the following:

1. The resource is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
2. The resource is associated with the lives of persons important in our past.
3. The resource embodies the distinctive characteristics of a type, period, region, or method of construction; represents the work of an important creative individual; or possesses high artistic values.
4. The resource has yielded, or may be likely to yield, information important in prehistory or history.

AB 52 also sets up an expanded consultation process. For projects initiated after July 1, 2015, lead agencies are required to provide notice of the proposed projects to any tribe that is traditionally and culturally affiliated with the geographic area that requested to be informed by the lead agency, following Public Resources Code Section 21018.3.1(b). If, within 30 days, a tribe requests consultation, the consultation process must begin before the lead agency can release a draft environmental document. Consultation with the tribe may include discussion of the type of review necessary, the significance of tribal cultural resources, the significance of the project's impacts on the tribal cultural resources, and alternatives and mitigation measures recommended by the tribe. The consultation process will be deemed concluded when either (a) the parties agree to mitigation measures or (b) any party concludes, after a good-faith effort, that an agreement cannot be reached. Any mitigation measures agreed to by the tribe and lead agency must be recommended for inclusion in the environmental document. If a tribe does not request consultation, or otherwise assist in identifying mitigation measures during the consultation process, a lead agency may still consider mitigation measures if the agency determines that a project will cause a substantial adverse change to a tribal cultural resource.

4.4.3.2 Local

Cultural Resources

South San Francisco General Plan

The 1999 General Plan provides a vision for long-range physical and economic development of the City, provides strategies and specific implementing actions, and establishes a basis for judging whether specific development proposals and public projects are consistent with the City of South

San Francisco's (City's) plans and policy standards. The General Plan contains an Open Space and Conservation Element, which outlines policies relating to habitat and biological resources, water quality, air quality, greenhouse gas emissions and historic and cultural resources conservation. The General Plan includes the following policies applicable to cultural resources:

- Policy 7.5-G-1: Conserve historic, cultural, and archaeological resources for the aesthetic, educational, economic, and scientific contribution they make to South San Francisco's identity and quality of life.
- Policy 7.5-G-2: Encourage municipal and community awareness, appreciation, and support for South San Francisco's historic, cultural, and archaeological resources.

The General Plan also establishes several specific guidelines for implementation of the guiding principles of the document. Specific guidelines that are relevant to this project include:

- Guideline 7.5-I-3: Explore mechanisms to incorporate South San Francisco's industrial heritage in historic and cultural preservation.
- Guideline 7.5-I-4: Ensure the protection of known archaeological resources in the City by requiring a records review for any development proposed in areas with known resources.
- Guideline 7.5-I-5: In accordance with state law, require the preparation of a resource mitigation plan and monitoring program by a qualified archaeologist in the event that archaeological resources are uncovered.

4.4.4 Impacts and Mitigation Measures

4.4.4.1 Significance Criteria

Cultural Resources

Based on Appendix G of the CEQA Guidelines, the proposed project would have a significant cultural resources impact if it would:

- Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5;
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5; or
- Disturb any human remains, including those interred outside of dedicated cemeteries.

Tribal Cultural Resources

Based on Appendix G of the CEQA Guidelines, the proposed project would have a significant tribal cultural resources impact if it would:

- Cause a substantial adverse change in the significance of a tribal cultural resource, defined in PRC Section 21074 as either a site, feature, place, or 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:
- Listed in, or eligible for listing in, the CRHR or a local register of historical resources, as defined in PRC Section 5020.1(k), or

- 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 PRC Section 5024.1. In applying the criteria set forth in subdivision (c) of PRC Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

4.4.4.2 Approach to Analysis

Cultural Resources

Evaluation of the proposed project is based on a records search conducted by ICF archaeologist Yuka Oiwa on February 21, 2020, at the Northwestern Information Center of the California Historic Resources Information System in Rohnert Park, California. Information centers are depositories of documentation for known archaeological and historic resources in California. The records search was conducted to identify all known archaeological and built-environment resources within the project area and within approximately 0.25 mile of the project site as well previous survey coverage of the project area. Records search results indicate that nineteen previous cultural resources studies have been conducted within 0.25 miles of the project site. Two of these studies have been conducted within the project site. The project site was previously surveyed in its entirety by Archaeological Resources Technology in 2016 and 2018. No cultural resources were identified within the project site as a result of the surveys.

Table 4.4-1 identifies the eight previously recorded cultural resources within 0.25 mile of the project site, including six built environment resources and two archaeological resources. The two archaeological resources within 0.25 mile of the project site, P-41-000044 and P41-002207, are prehistoric shell midden sites. There are no known archaeological or built-environment resources within the project site.

Table 4.4-1. Cultural Resources within 0.25 Mile of the Project Site

Primary Number	Trinomial	Age	Name	Description	Within Project Site?
P-41-000044	CA-SMA-40	Prehistoric	N/A	Shell Midden	No
P-41-000814		Historic	Grand Hotel	Hotel Building	No
P-41-000885		Historic	205 Juniper Avenue	Craftsman Bungalow	No
P-41-000956		Historic	225 Juniper Avenue	Italianate False Front House	No
P-41-002207	CA-SMA-386	Prehistoric	Airport & Armour Buried Site	Shell Midden	No
P-41-002318		Historic	T-Mobile West LLC SF73113B	PG&E Tower	No
P-41-002433		Historic	Signal Bridge North of Grand Ave Overpass	Signal Bridge	No
P-51-002434		Historic	129 Sylvester Road	Industrial Building	No

Source: Records search conducted by ICF archaeologist Yuka Oiwa on February 21, 2020, at the Northwestern Information Center of the California Historic Resources Information System in Rohnert Park, California.

Tribal Cultural Resources

Efforts to identify tribal cultural resources within the project area included consultation with interested Native American groups under AB 52.

On January 15, 2020, the City distributed tribal consultation letters to the following organizations: the Amah Mutsun Tribal Band of Mission San Juan, the Costanoan Rumsen Carmel Tribe, the Indian Canyon Mutsun Band of Costanoan, the Muwekma Ohlone Indian Tribe of the San Francisco Bay Area, and the Ohlone Indian Tribe. Included in the letters was a brief description of the project, the results of a records search, project location maps, and a request for comments, concerns, or knowledge regarding sacred lands or heritage sites in the project area. Native American groups had 30 days from the receipt of the letter to request consultation under AB 52; no requests for consultation were received during the 30-day period, which ended on February 15, 2020. A record of all AB 52 consultation is provided in Appendix C of this draft EIR.

4.4.4.3 Impact Evaluation

Impact CR-1: The proposed project would not cause a substantial adverse change in the significance of a historical resource, pursuant to Section 15064.5. (*No Impact*)

The project site is currently developed with a six-story, approximately 170,235-square-foot office building at 701 Gateway Boulevard and surface parking lots. The existing building at 701 Gateway Boulevard was constructed in 1998. This existing structure is not historic in age and is not eligible for designation on the CRHR. Records search results indicate that there are no known built-environment resources within the project site. Therefore, the proposed project would have ***no impact*** on historical resources. No mitigation is required.

Impact CR-2: The proposed project would not cause a substantial adverse change in the significance of an archaeological resource, pursuant to Section 15064.5. (*Less than Significant with Mitigation*)

Records search results indicate the project site is close to the prehistoric coastline, making it sensitive for the presence of prehistoric shell midden sites. There are two previously recorded cultural resources within 0.25 mile of the project site, P-41-000044 and P41-002207. Both resources are prehistoric shell midden sites. However, there are no previously recorded archaeological resources within the project site. In addition, the project site was previously surveyed in its entirety by Archaeological Resources Technology in 2016 and 2018. No cultural resources were identified within the project site as a result of the surveys. Furthermore, the project site is fully developed and lacks surface visibility. Any visible ground surface has been disturbed and/or covered with fill and gravel. All visible ground surfaces appear to have been graded, landscaped, or developed. Notwithstanding, given the presence of two known prehistoric sites within the vicinity of the project, and given the proximity of the project site to the coast, the project site has a moderate sensitivity for similar buried archaeological resources.

The proposed project would excavate approximately 1,850 cubic yards of soil that would be reused as fill on-site, and would import an additional 750 cubic yards of soil to be used as fill on-site. To accommodate utility trenches, the project would require a maximum depth of excavation reaching approximately 9 feet below ground surface. Previously unknown archaeological resources could be inadvertently unearthed during ground-disturbing activities, which would be a ***significant*** impact. Implementation of Mitigation Measure CR-1, Cultural Resources Worker

Environmental Awareness Program (WEAP), and Mitigation Measure CR-2, Halt Construction Activity, Evaluate Find, and Implement Mitigation for Archaeological, Historical, and Tribal Resources, would reduce this impact to ***less than significant with mitigation*** by ensuring that project activities would not result in the inadvertent destruction of an archaeological resource.

Mitigation Measure CR-1: Cultural Resources Worker Environmental Awareness Program

The project applicant shall ensure that a qualified archaeologist shall conduct WEAP training for all construction personnel on the project site prior to construction and ground-disturbing activities. The training shall include basic information about the types of artifacts that might be encountered during construction activities, and procedures to follow in the event of a discovery. This training shall be provided for any additional personnel added to the project even after the initiation of construction and ground-disturbing activities.

Mitigation Measure CR-2: Halt Construction Activity, Evaluate Find, and Implement Mitigation for Archaeological, Historical, and Tribal Resources

In the event that previously unidentified archaeological, historical, or tribal resources are uncovered during site preparation, excavation, or other construction activity, the project applicant shall cease or ensure the ceasing of all such activity within 25 feet of the discovery until the resources have been evaluated by a qualified professional, and specific measures can be implemented to protect these resources in accordance with Sections 21083.2 and 21084.1 of the California Public Resources Code. If the find is significant, the project applicant shall ensure that a qualified archaeologist excavate the find in compliance with state law, keeping project delays to a minimum. If the qualified archaeologist determines the find is not significant, then proper recordation and identification will ensue and the project shall continue without delay.

Impact CR-3: The proposed project would not disturb any human remains, including those interred outside of formal cemeteries. (*Less than Significant with Mitigation*)

Records search results did not indicate the presence of human remains within the project site. As discussed under Impact CR-3, no formal cemeteries have been located on the project site, and human remains would be unlikely to be found. However, if inadvertent discovery of human remains occurs during ground-disturbing activities, this would be a ***significant*** impact. Implementation of Mitigation Measure CR-3, Halt Construction Activity, Evaluate Remains, and Take Appropriate Action in Coordination with Native American Heritage Commission, would reduce this impact to ***less than significant with mitigation*** by ensuring that discovery procedures for human remains would be implemented.

Mitigation Measure CR-3: Halt Construction Activity, Evaluate Remains, and Take Appropriate Action in Coordination with Native American Heritage Commission

In the event that human remains are uncovered during site preparation, excavation, or other construction activity, the project applicant shall cease or ensure the ceasing of all such activity within 25 feet of the discovery until the remains have been evaluated by the County Coroner and appropriate action taken in coordination with the NAHC, in accordance with Section 7050.5 of the CHSC or, if the remains are Native American, Section 5097.98 of the California Public Resources Code.

Impact CR-4: The proposed project would not cause a substantial adverse change in the significance of a tribal cultural resource, as defined in Public Resources Code Section 21074. (*Less than Significant with Mitigation*)

No Native American tribes have identified tribal cultural resources within the project site. In addition, no Native American tribes requested further consultation under AB 52 regarding the project, and no Native American tribes have identified unrecorded tribal cultural resources within the project area. However, if inadvertent discovery of tribal cultural resources occurs during ground-disturbing activities, this would be a ***significant*** impact. Implementation of Mitigation Measure CR-1, Cultural Resources Worker Environmental Awareness Program (WEAP), and Mitigation Measure CR-2, Halt Construction Activity, Evaluate Find, and Implement Mitigation for Archaeological, Historical, and Tribal Resources, would reduce this impact to ***less than significant with mitigation*** by ensuring that discovery procedures for tribal cultural resources would be implemented.

4.4.4.4 Cumulative Impacts

Impact C-CR-1: The proposed project would not result in a cumulatively considerable contribution to significant cumulative impacts on archaeological resources, human remains, and tribal cultural resources. (*Less than Significant with Mitigation*)

The cumulative geographic context for archaeological resources and human remains is the immediate vicinity of the project site, which is the area where construction activities, including ground-disturbing activities, could encounter archaeological resources, human remains, and tribal cultural resources that may be present on or near the site. The cumulative projects within 0.5 mile of the project site are described in Section 4.1.5, *Approach to Cumulative Impact Analysis*, of this draft EIR and shown in Figure 4.1-1.

The cumulative projects in the vicinity of the project site would be constructed on infill sites in highly disturbed areas. It is likely that the cumulative projects would be constructed on sites where the ground surface has been disturbed and/or covered with fill and gravel. Similar to the proposed project, all cumulative projects would be required to implement mitigation measures to ensure that project activities would not result in the inadvertent destruction of an archaeological resource and that human remains discovery procedures would be implemented. Nonetheless, cumulative impacts on archaeological resources, human remains, and tribal cultural resources could be ***significant*** because the reasonably foreseeable projects would likely involve ground-disturbing activities that could uncover resources related to resources that could be uncovered by the project.

Implementation of Mitigation Measure CR-1, Cultural Resources Worker Environmental Awareness Program; Mitigation Measure CR-2, Halt Construction Activity, Evaluate Find, and Implement Mitigation for Archaeological, Historical, and Tribal Resources; and Mitigation Measure CR-3, Halt Construction Activity, Evaluate Remains, and Take Appropriate Action in Coordination with Native American Heritage Commission, would ensure that the proposed project's contribution to cumulative impacts on archaeological resources, human remains, and tribal cultural resources would be ***less than cumulatively considerable***.

4.5 Energy

4.5.1 Introduction

This section describes the environmental and regulatory setting for energy. It also describes impacts associated with energy that would result from implementation of the proposed project and mitigation for significant impacts where feasible and appropriate. The detailed methodologies used to assess the level of impacts related to energy are provided in Appendix B of this draft environmental impact report (EIR).

4.5.2 Environmental Setting

Energy resources in the State of California include natural gas, electricity, water, wind, oil, coal, solar, geothermal, and nuclear resources. Energy production and energy use both result in the depletion of nonrenewable resources, such as oil, natural gas, and coal, and emissions of pollutants.

4.5.2.1 State Energy Resources and Use

California's diverse portfolio of energy resources produced 2,536 trillion British thermal units (BTUs)[1] in 2017.[2] Excluding offshore areas, the state ranked fourth in the nation in crude oil production in 2017 (the most recent year for which data are available), producing the equivalent of 996.4 trillion BTUs.[3] The state ranked first in total renewable energy generation, with 1,115.3 trillion BTUs. Other energy sources in the state include natural gas (236.8 trillion BTUs), nuclear (187.2 trillion BTUs), and biofuel (29.8 trillion BTUs).[4,5,6] In addition, because of the mild Mediterranean climate and strict conservation requirements for energy efficiency, California has lower energy consumption rates than most parts of the United States. According to the U.S. Energy Information Administration, California consumed approximately 7,881.3 trillion BTUs of energy in 2017.[7] California's per capita energy consumption of 200 million BTUs is one of the lowest in the country and ranked 48th in the nation as of 2017.[8]

---

1 One BTU is the amount of energy required to heat 1 pound of water by 1°F at sea level. BTU is a standard unit of energy that is used in the United States and is on the English system of units (foot-pound-second system).

2 U.S. Energy Information Administration. 2019a. *Table P5B—Primary Energy Production Estimates, Renewable and Total Energy, in Trillion BTU, Ranked by State, 2017*. Available: https://www.eia.gov/state/seds/sep_prod/pdf/P5B.pdf. Accessed: April 22, 2020.

3 US Energy Information Administration. 2019b. *Table P5A—Primary Energy Production Estimates, Fossil Fuels and Nuclear Energy, in Trillion BTU, Ranked by State, 2017*. Available: https://www.eia.gov/state/seds/sep_prod/pdf/P5A.pdf. Accessed: April 22, 2020.

4 No coal production occurs in California.

5 US Energy Information Administration. 2019a. *Table P5B—Primary Energy Production Estimates, Renewable and Total Energy, in Trillion BTU, Ranked by State, 2017.*

6 US Energy Information Administration. 2019b. *Table P5A—Primary Energy Production Estimates, Fossil Fuels and Nuclear Energy, in Trillion BTU, Ranked by State, 2017.*

7 US Energy Information Administration. 2019c. *Table C10—Energy Consumption Estimates by End-Use Sector, Ranked by State, 2017.* Available: https://www.eia.gov/state/seds/sep_sum/html/rank_use.html. Accessed: April 22, 2020.

8 US Energy Information Administration. 2019d. *Table C13—Energy Consumption Estimates per Capita by End-Use Sector, Ranked by State, 2017.* Available: https://www.eia.gov/state/seds/data.php?incfile=/state/seds/sep_sum/html/rank_use_capita. html&sid=US. Accessed: April 22, 2020.

In 2017, natural gas accounted for the majority of energy consumption (2,190.6 trillion BTUs, or 28 percent), followed by gasoline (1,720.8 trillion BTUs or 22 percent); renewable energy, including nuclear electric power, hydroelectric power, biomass, and other renewables (1,416.8 trillion BTUs, or 18 percent); distillates and jet fuel (1,270.3 trillion BTUs, or 16 percent); and interstate electricity (659.4 trillion BTUs, or 8 percent), with the remaining 8 percent coming from a variety of other sources.[9] Of the natural gas consumed, commercial uses consumed approximately 11 percent, followed by residential uses (20 percent) and industrial uses (36 percent), among many other uses.[10]

The transportation sector consumed the greatest quantity of energy (3,174.9 trillion BTUs, or 40.3 percent), followed by the industrial (1,817.8 trillion BTUs, or 23.1 percent), commercial (1,473.1 trillion BTUs, or 18.7 percent), and residential (1,415.5 trillion BTUs, or 18 percent) sectors.[11]

Per capita energy consumption, in general, is declining because of improvements in energy efficiency and designs. However, despite this reduction in per capita energy use, the state's total overall energy consumption (i.e., non-per capita energy consumption) is expected to grow over the next several decades as a result of increases in population, jobs, and vehicle miles traveled (VMT).

4.5.2.2 Regional Energy Resources and Use

Pacific Gas and Electric (PG&E) provides natural gas and electricity services to the vast majority of Northern California, including the City of South San Francisco and the project site. PG&E's service extends from Eureka to Bakersfield (north to south) and from the Sierra Nevada to the Pacific Ocean (east to west). PG&E purchases gas and power from a variety of sources, including other utility companies. PG&E also obtains energy supplies from power plants and natural gas fields in Northern California. PG&E operates a grid distribution system that channels all power produced at the various generation sources into one large energy pool for distribution throughout the service territory. PG&E provides all of the natural gas and electric infrastructure in South San Francisco. PG&E has two plan options, known as Solar Choice options, in addition to its base plan, which gives customers the option to purchase energy from solar resources. The first Solar Choice option provides up to 50 percent of a customer's energy from solar resources, while the other option provides up to 100 percent of customer's energy from solar resources. In addition, Peninsula Clean Energy (PCE) is San Mateo County's official electricity provider. PCE's power comes from a mix of various sources, including solar, wind, geothermal, biomass and biowaste, and hydroelectric generation resources. PCE delivers power to its customers via existing PG&E utility infrastructure.[12] PCE allows customers to choose between two different electricity product operations: ECOplus (50 percent renewable resources as electricity sources) and ECO100 (100 percent renewable resources as electricity sources).[13]

---

9 US Energy Information Administration. 2020a. *California State Energy Profile*. Available: https://www.eia.gov/state/print.php?sid=CA. Accessed: April 22, 2020.

10 US Energy Information Administration. 2020b. *Natural Gas Consumption by End Use—California*. Available: https://www.eia.gov/dnav/ng/ng_cons_sum_dcu_SCA_a.htm. Accessed: April 22, 2020.

11 US Energy Information Administration. 2019c. *Table C10—Energy Consumption Estimates by End-Use Sector, Ranked by State, 2017.*

12 PCE charges each of its customers an electric delivery charge for maintenance of PG&E's wires, infrastructure, and delivery of electricity to customers.

13 Peninsula Clean Energy. 2020. What are My Rates? Available: https://www.peninsulacleanenergy.com/for-businesses/. Accessed: July 23, 2020.

In San Mateo County, a total of 209.7 million therms of natural gas were consumed in 2018 (the most recent year for which data are available). In 2018, natural gas in San Mateo County was consumed primarily by the residential sector (55 percent), followed by the non-residential sector (45 percent).[14] In 2018, San Mateo County consumed a total of 4,254.6 million kilowatts of electricity. In San Mateo County, electricity was consumed primarily by the non-residential sector (65 percent), followed by the residential sector (35 percent).[15] Electricity usage for different land uses varies substantially by the type of uses in a building, the types of construction materials used, and the efficiency of the electricity-consuming devices. However, energy consumption in the City of South San Francisco has generally decreased over recent years despite a growing population, as shown in the 2010–2015 data in Table 4.5-2 (the most recent years for which data are available).[16]

Table 4.5-1 outlines PG&E's and PCE's power mix in 2018, compared to the power mix for the state, and Table 4.5-2 outlines the City of South San Francisco's electricity and natural gas consumption from 2010 to 2015.

Table 4.5-1. PG&E, PCE, and the State of California Power Mix in 2018

Energy Resources	PG&E Option: Base Plan	PG&E Option: 50% Solar Choice	PG&E Option: 100% Solar Choice	PCE Option: ECOplus	PCE Option: ECO100	California Power Mix 2018
Eligible Renewable:	39%	69%	100%	51%	100%	31%
Biomass and Waste	4%	2%	0%	5%	0%	2%
Geothermal	4%	2%	0%	2%	0%	5%
Small Hydroelectric	3%	1%	0%	5%	0%	2%
Solar	18%	59%	100%	7%	50%	11%
Wind	10%	5%	0%	33%	50%	11%
Coal	0%	0%	0%	0%	0%	3%
Large Hydroelectric	13%	6%	0%	35%	0%	11%
Natural Gas	15%	7%	0%	0%	0%	35%
Nuclear	34%	17%	0%	0%	0%	9%
Other	0%	0%	0%	0%	0%	< 1%
Unspecified[1]	0%	0%	0%	14%	0%	11%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: PG&E. 2019. *Where Your Electricity Comes From*. Available: https://www.pge.com/pge_global/common/pdfs/your-account/your-bill/understand-your-bill/bill-inserts/2019/1019-Power-Content-Label.pdf. Accessed: April 22, 2020.

PCE. 2019. *2018 Power Content Label*. Available: https://www.peninsulacleanenergy.com/wp-content/uploads/2019/10/PCE_EV-Incentive-Program-Postcard-Series_Final.pdf. Accessed: July 23, 2020.

[a] Electricity from transactions that are not traceable to specific generation sources are classified as unspecified sources of power.

[14] California Energy Commission. n.d. *Gas Consumption by County—San Mateo County 2018*. Available: https://ecdms.energy.ca.gov/gasbycounty.aspx. Accessed: April 22, 2020.

[15] California Energy Commission. n.d. *Electricity Consumption by County—San Mateo County 2018*. Available: https://ecdms.energy.ca.gov/elecbycounty.aspx. Accessed: April 22, 2020.

[16] County of San Mateo Datahub. 2019. *South San Francisco Energy Contribution to Greenhouse Gas Emissions, Natural Gas Consumption Bar Graph 2*. Available: https://datahub.smcgov.org/Environment/South-San-Francisco-Energy-Contribution-to-Greenho/rsnt-9iwn. Accessed: April 21, 2020.

Table 4.5-2. Electricity and Natural Gas Consumption in the City of South San Francisco, 2010–2015

Energy Resources	Electricity (kWh)	Natural Gas (therms)
2010		
Residential	106,482,913	9,430,667
Commercial and Industrial	231,478,981	14,967,060
Total	**337,961,894**	**24,397,727**
2011		
Residential	104,502,797	9,472,247
Commercial and Industrial	228,863,085	15,054,584
Total	**333,365,882**	**24,526,831**
2012		
Residential	103,260,746	9,208,976
Commercial and Industrial	223,204,783	14,878,901
Total	**326,465,529**	**24,087,877**
2013		
Residential	101,583,862	9,130,055
Commercial and Industrial	217,442,565	14,529,796
Total	**319,026,427**	**23,659,851**
2014		
Residential	96,370,466	7,379,210
Commercial and Industrial	224,214,612	12,837,263
Total	**320,585,078**	**20,216,473**
2015		
Residential	95,163,472	7,310,750
Commercial and Industrial	221,831,910	13,295,230
Total	**316,995,382**	**20,605,980**

Source: County of San Mateo Datahub. 2019. *South San Francisco Energy Contribution to Greenhouse Gas Emissions, Natural Gas Consumption Bar Graph 2*. Available: https://performance.smcgov.org/stories/s/pii5-fvmc. Accessed: April 21, 2020.

kWh = kilowatt hour

4.5.2.3 Project Site Energy Resources and Use

The project site includes a six-story, approximately 170,235-square-foot office building at 701 Gateway Boulevard and surface parking lots. Table 4.5-3 provides the existing energy usage at the project site.

As stated previously, PG&E provides natural gas and electricity to the City of South San Francisco, and therefore the project site, through its right-of-way electric and natural gas lines. The project site is served by existing natural gas and electric infrastructure provided by PG&E. Underground electric lines are located in the eastern portion of the north surface parking lot, and a 4-inch natural gas main is located in Gateway Boulevard.

Table 4.5-3. Existing Energy Consumption at the Project Site

Energy	Existing Usage
Electricity	1,753,936 kWh/year
Natural Gas	44,677 therm/year
Gasoline	243,226 gallons/year
Diesel	28,680 gallons/year

Source: See Appendix B of this draft EIR for CalEEMod outputs.
kWh = kilowatt hour

4.5.3 Regulatory Framework

4.5.3.1 Federal

As discussed in Sections 4.2, *Air Quality*, and 4.7, *Greenhouse Gas Emissions*, of this draft EIR, the National Highway Traffic Safety Administration (NHTSA) sets the Corporate Average Fuel Economy (CAFÉ) standards to improve average fuel economy (i.e., reduce fuel consumption) and reduce greenhouse gas (GHG) emissions generated by cars and light-duty trucks. NHTSA and the U.S. Environmental Protection Agency (EPA) have proposed amendments to the current fuel efficiency standards for passenger cars and light-duty trucks and new standards for model years 2021 through 2026. Under the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule, current 2020 standards would be maintained through 2026. California, 22 other states, the District of Columbia, and two cities filed suit against the proposed action on September 20, 2019 (*California et al. v. United States Department of Transportation et al.,* 1:19-cv-02826, U.S. District Court for the District of Columbia). The lawsuit requests a "permanent injunction prohibiting defendants from implementing or relying on the preemption regulation" but does not stay its implementation during legal deliberations. Part 1 of the SAFE Vehicles Rule went into effect on November 26, 2019.

4.5.3.2 State

California has adopted statewide legislation to address various aspects of climate change and greenhouse gases, which often pertain directly or indirectly to energy resources and uses. This section is focused on State legislation that specifically mentions energy use or resources. For other State legislation mainly focused on greenhouse gas reduction and climate change, refer to Section 4.7, *Greenhouse Gas Emissions*, of this draft EIR.

Assembly Bill 1493, Pavley Rules (2002, amendments 2009)/Advanced Clean Cars (2011)

Known as Pavley I, Assembly Bill (AB) 1493 provided the nation's first GHG standards for automobiles. AB 1493 required the California Air Resources Board (CARB) to adopt vehicle standards to lower GHG emissions from automobiles and light-duty trucks to the maximum extent feasible beginning in 2009. In 2012, strengthening of the Pavley standards (referred to previously as Pavley II but now referred to as the Advanced Clean Cars measures) was adopted for vehicle model years 2017 through 2025. Together, the two standards are expected to increase average fuel economy to roughly 54.5 miles per gallon in 2025. The increase in fuel economy will help lower the demand for fossil fuels.

California Energy Efficiency Standards for Residential and Nonresidential Buildings—California Green Building Standards Code (2011), Title 24 Updates

The California Green Building Standards Code (Part 11, Title 24), or CALGreen, was adopted as part of the California Building Standards Code (24 California Code of Regulations). CALGreen applies to the planning, design, operation, construction, use, and occupancy of newly constructed buildings and requires energy- and water-efficient indoor infrastructure to be installed at all new projects beginning January 1, 2011. CALGreen also requires newly constructed building to develop a waste management plan and divert at least 50 percent of the construction materials generated during project construction.

The current 2019 Building Energy Efficiency Standards were adopted in 2019 and took effect on January 1, 2020. Under the 2019 standards, homes will use about 53 percent less energy than homes constructed under the 2016 standards, while nonresidential buildings will use about 30 percent less energy. Later standards are expected to require zero net energy for new commercial buildings.

Executive Order B-16-12 (2012)

Executive Order (EO) B-16-12 orders state entities under the direction of the governor, including CARB, the California Energy Commission (CEC), and the California Public Utilities Commission (CPUC), to support rapid commercialization of zero-emission vehicles. It directs these entities to achieve various benchmarks related to zero-emission vehicles.

Senate Bill 350, Chapter 547, Clean Energy and Pollution Reduction Act of 2015

Senate Bill (SB) 350 (DeLeon), also known as the Clean Energy and Pollution Reduction Act of 2015, was approved by California legislature in September 2015 and signed by Governor Brown in October 2015. Its key provisions require the following by 2030: (1) a Renewables Portfolio Standard (RPS)[17] of 50 percent and (2) doubling of the statewide energy efficiency savings related to natural gas and electricity end uses. In order to meet these provisions, the bill requires large utilities to develop and submit integrated resource plans that detail how the utilities will reduce GHG emissions and increase the use of clean energy resources while meeting customers' needs.

Senate Bill 100—The 100 Percent Clean Energy Act of 2018 (2018)

SB 100 builds on SB 350, the Clean Energy and Pollution Reduction Act of 2015. SB 100 increases the 2030 RPS target set in SB 350 to 60 percent and requires an RPS of 100 percent by 2045.

4.5.3.3 Regional

PG&E Integrated Resource Plan

PG&E adopted the 2018 Integrated Resource Plan (IRP) on August 1, 2018, to provide guidance for serving the electricity and natural gas needs of residents and businesses within its service area while fulfilling regulatory requirements. The IRP contains the following objectives that are relevant to the proposed project:

---

[17] The RPS is one of California's key programs for promoting renewable energy use within the state. The program sets forth continuous procurement of renewable energy for load-serving entities within California (California Energy Commission 2020).

- **Clean Energy**: In 2017, PG&E delivered nearly 80 percent of its electricity from GHG-free resources and 33 percent of its electricity from RPS-eligible renewable resources, such as solar, wind, geothermal, biomass, and small hydro.
- **Reliability**: PG&E's IRP analysis includes PG&E's contribution to system and local reliability, in compliance with the CPUC's resource adequacy requirements.
- **Affordability**: PG&E's IRP analysis selects resources to meet the state's clean energy and reliability goals and provides a system average rate forecast in compliance with the CPUC's requirements for investor-owned utilities.

PCE 2018 Integrated Resource Plan

Peninsula Clean Energy (PCE) is a community choice energy program that serves the entirety of San Mateo County, including the City of South San Francisco. PCE adopted the 2018 IRP on December 14, 2017 to provide guidance for serving the electricity needs of the residents and businesses in the County, all while fulfilling regulatory requirements over a 10-year period form 2018-2027. The plan contains the following strategic goals that are relevant to the proposed project:

- Design a diverse power portfolio that is greenhouse gas free
  - 100 percent GHG free by 2021
  - 100 percent RPS-eligible renewable energy by 2025
  - Minimum of 20 MWs of new local power by 2025
- Stimulate development of new renewable energy projects and clean-tech innovation in San Mateo County and California through PCE's procurement activities
- Implement programs to further reduce greenhouse gas emissions by investing in programs such as local clean power production, electric vehicles, energy efficiency, and demand response, and partnering effectively with local businesses, schools, and nonprofit organizations

PCE meets its renewable energy requirements with a combination of RPS-eligible energy products. According to PCE's 2018 IRP, PCE procured enough renewable energy to meet a 50 percent voluntary target as of 2017. The proportion of PCE's resource mix that is sourced from bundled renewable energy products will significantly increase as PCE transitions toward 100 percent renewable energy content in 2025. Based on targeted renewable energy percentages, PCE intends to significantly outpace California's annual RPS procurement mandates throughout the 2018-2027 planning period.

4.5.3.4 Local

South San Francisco General Plan

The City of South San Francisco (City) 1999 General Plan provides a vision for long-range physical and economic development of the City, provides strategies and specific implementing actions, and establishes a basis for judging whether specific development proposals and public projects are consistent with the City's plans and policy standards. The City General Plan contains an Open Space and Conservation Element, which outlines policies related to habitat and biological resources, water quality, air quality, GHG emissions, and historic and cultural resources. The City General Plan includes the following policies that are applicable to energy:

- Guiding Policy 7.3-G-3: Reduce energy use in the built environment.
- Guiding Policy 7.3-G-4: Encourage land use and transportation strategies that promote the use of alternatives to the automobile for transportation, including bicycling, bus transit, and carpooling.
- Guiding Policy 7.3-G-5: Promote clean and alternative-fuel combustion in mobile equipment and vehicles.
- Implementing Policy 7.3-I-9: Promote land uses that facilitate alternative transit use, including high-density housing, mixed uses, and affordable housing served by alternative transit infrastructure.
- Implementing Policy 7.3-I-10: Facilitate energy efficiency in building regulations and streamlined review processes, providing flexibility to achieve specified energy performance levels and requiring energy efficiency measures as appropriate.
- Implementing Policy 7.3-I-13: Encourage efficient, clean energy and fuel use through collaborative programs, award programs, and incentives while removing barriers to the expansion of alternative-fuel facilities and infrastructure.
- Implementing Policy 7.3-I-14: Ensure that design guidelines and standards support operation of alternative-fuel facilities, vehicles, and equipment.

Climate Action Plan

The City's Climate Action Plan (CAP), adopted in 2014, includes goals, policies, and strategies to reduce the City's greenhouse gas (GHG) emissions, in compliance with AB 32 and SB 375. GHG reduction strategies identified in the CAP include a development checklist to identify applicable plan measures for discretionary projects. The City's CAP was adopted with the purpose of reducing GHGs community wide to achieve a reduction target of 15 percent below 2005 emission levels by 2020. The City has identified GHG reduction measures in the transportation, energy, waste, water and wastewater, and land use sectors, coupled with state and exiting local actions, to reduce GHG emissions. GHG emissions largely involve energy consumption, (i.e., fossil-fuel usage); therefore, a reduction in GHG emissions would also equate to a reduction in energy consumption.

The following GHG reduction measures are applicable to energy:[18]

- Measure 1.1: Expand active transportation alternatives by providing infrastructure and enhancing connectivity for bicycle and pedestrian access.
- Measure 2.1: Expand the use of alternative-fuel vehicles, in part, by requiring large-scale nonresidential developments to provide a conduit for future electric-vehicle charging installations and encouraging the installation of conduits or electric-vehicle charging stations for all new development.
- Measure 3.1: Maximize energy efficiency in the built environment through standards and the plan review process.

[18] City of South San Francisco. 2014. *City of South San Francisco Climate Action Plan.* Adopted: February 13. Available: https://www.ssf.net/home/showdocument?id=1318. Accessed: April 22, 2020

- Measure 4.1: Promote the installation of alternative energy facilities, in part by (i) requiring new nonresidential conditioned space of 5,000 square feet or more to meet energy reduction standards by providing a minimum of 50 percent of building electricity needs through on-site renewable energy, participating in a power purchase agreement to offset a minimum of 50 percent of modeled building electricity use, or complying with CALGreen (Title 24) Tier 2 energy efficiency requirements to exceed mandatory energy efficiency requirements by 20 percent or more and (ii) requiring all new development to install a conduit to accommodate wiring for solar.

The City's CAP is currently being updated, as part of the General Plan Update process. The 2014 CAP remains active until completion and adoption of the new CAP.

Gateway Specific Plan

The Gateway Specific Plan covers the portion of the East of 101 Area Plan from east of the Caltrain tracks to the eastern boundary of the parcels along the east side of Gateway Boulevard and the area between Oyster Point Boulevard and Grand Avenue on the northern and southern boundaries. The Specific Plan is "intended to provide for various commercial and research and development land uses integrated by consistent development standards." The Gateway Specific Plan includes the following construction standard applicable to energy:

- Construction Standard 1(d): Energy Conservation. All Buildings shall be designed, insulated and lighted in accordance with applicable federal and state energy conservation laws and regulations.

East of 101 Area Plan

The *East of 101 Area Plan*, which was adopted in 1994 and most recently amended in 2016, sets forth specific land use policies for the East of 101 Area. The City interprets the *East of 101 Area Plan* as a design-level document. Per Policy IM-5, the Gateway Specific Plan is not affected by the land use regulations of the East of 101 Area Plan. Therefore, the policies in the General Plan Open Space and Conservation Element are the guiding policies and supersede policies set forth in the *East of 101 Area Plan*. Nonetheless, the *East of 101 Area Plan* contains the following goals and policies applicable to energy:

- Goal 2.5: Encourage and support transportation modes other than single-occupancy automobiles, including ride sharing, bicycling, walking, and transit.
- Goal 2.6: Promote the use of public transit to and within the East of 101 Area.
- Policy CIR-7: All new developments shall contain facilities to support transit, provided by both public and private means.
- Policy CIR-8: The City of South San Francisco and the employers of the area shall work with the Multi-City TSM Agency, or any other applicable transportation management agencies, to increase shuttle bus service and usage.
- Policy CIR-13: All new developments of 25,000 square feet or more of gross building floor area and projected to accommodate 30 or more full-time equivalent employees, should include showers, locker rooms, and secure parking areas to support the use of bicycles.
- Goal 3.4: Promote water and energy conservation in all new development.

4.5.4 Impacts and Mitigation Measures

4.5.4.1 Significance Criteria

Based on Appendix G of the CEQA Guidelines, the proposed project would have a significant energy impact if it would:

- Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation; or
- Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

4.5.4.2 Approach to Analysis

Energy impacts associated with construction and operation of the proposed project were assessed and quantified where applicable using standard and accepted software tools and techniques. A summary of the methodology for calculating the project's energy use is provided below.

Appendix F of the State CEQA Guidelines provides guidance on determining whether a project would result in the wasteful, inefficient, or unnecessary consumption of energy resources. As stated in Appendix F, the goal of conserving energy implies the wise and efficient use of energy. The means for achieving this goal include:

- Decreasing overall per capita energy consumption;
- Decreasing reliance on fossil fuels such as coal, natural gas, and oil; and
- Increasing reliance on renewable energy sources.

Based on Appendix F, environmental considerations in the assessment of energy consumption impacts may include the following:

- The project's energy requirements and its energy efficiency by amount and fuel type for each stage of the project, including construction, operation, maintenance, and/or removal. If appropriate, the energy intensiveness of materials may be discussed.
- The effects of the project on local and regional energy supplies and requirements for additional capacity.
- The effects of the project on peak- and base-period demands for electricity and other forms of energy.
- The degree to which the project complies with existing energy standards.
- The effects of the project on energy resources.
- The project's forecast transportation energy use requirements and its overall use of efficient transportation alternatives.

Project Construction

Construction of the project would require energy usage, such as electricity for mobile offices and fuel for off-road equipment, haul trucks, vendor trips, and workers' trips. The construction schedule, equipment operating details, trip numbers and lengths, and material quantities were provided by the project sponsor. In addition, information regarding total electricity usage during project construction was provided by the project sponsor. Fuel usage was quantified using the construction emissions profile generated by the California Emissions Estimator Model (CalEEMod), version 2016.3.2. The number of metric tons of carbon dioxide equivalent (CO_2e) associated with each construction activity (e.g., off-road equipment usage, worker trips) was converted to gallons of diesel or gasoline and summed accordingly, assuming all off-road activities, hauling, and vendor activities would be carried out with use of diesel equipment and vehicles and that all workers would use gasoline vehicles while traveling to and from the project site. For ease of comparison across all energy consumption amounts, gallons of diesel and gasoline was converted to BTUs, assuming an energy intensity of 124,000 BTUs per gallon of gasoline and 139,000 BTU per gallon of diesel.[19] The CalEEMod output files and fuel-use calculations are provided in Appendix B of this draft EIR.

Project Operation

Traffic data for the proposed project was provided by Fehr & Peers and evaluated using CARB's EMFAC2017 emissions model (version 1.02). The data were used to estimate energy consumption for motor vehicles traveling to and from the project site.[20] Because the office building at 701 Gateway Boulevard would remain on the site, operational mobile energy consumption associated with the existing building was estimated and presented under existing (2019) and future conditions (2021).[21]

To determine the energy consumption from mobile sources (i.e., from vehicle movement/travel), the number of employees on the project site and a VMT per capita conversion factor, both provided by Fehr & Peers, were used to estimate total VMT with and without the project. The number of daily employee trips assumes an alternate mode share (AMS) of 26 percent consistent with the City/County Association of Governments of San Mateo County (C/CAG) model and analysis for other similar projects within the City and the region. Fuel use was quantified by multiplying annual VMT under existing (2019) and with-project (2021) conditions as well as the respective per mile gasoline and diesel factors provided by EMFAC2017. The EMFAC0217 fuel factors and traffic data used in this analysis are provided in Appendix B of this draft EIR.

Energy consumption associated with the project site includes the combustion of natural gas and electricity usage, including the electricity used to convey water to the project site. Similar to mobile-source consumption, because the office building at 701 Gateway Boulevard would remain on the site, energy consumption associated with the existing building was estimated and presented under existing (2019) and future (2021) conditions. Water consumption numbers for the existing office building at 701 Gateway Boulevard and anticipated water consumption for the building were provided by the project sponsor. Per the project applicant, the existing parking lot at 751 Gateway Boulevard has no associated energy or water consumption.[22] A detailed discussion of existing and proposed water consumption is provided in Section 4.10, *Less-than-Significant Impacts*, Subsection 4.10.11, *Utilities*, of this draft EIR. Annual energy consumption at 751 Gateway was estimated using CalEEMod under future (2021) conditions. Energy associated with water conveyance was estimated

---

19 Environment and Ecology. 2020. *Energy Units and Calculators*. Available: http://environment-ecology.com/what-is-energy/90-energy-units-and-calculators.html. Accessed: April 17, 2020.

20 Hawkins, Mike. Fehr & Peers. March 13, 2020—email to Jessica Viramontes: 751 Gateway Updated Transportation Materials.

21 There are no emission sources associated with the existing surface parking lot; therefore, there are no emissions associated with the lot under the existing condition. Emissions presented for the existing condition represent those from the office building at 701 Gateway Boulevard.

22 Muchow, Chase. RMW Architecture & Interiors. March 2, 2020—email to Jessica Viramontes: 751 Gateway – Priority 1 and 2 Follow-Up.

using CalEEMod and added to the energy usage of the respective components. The 2021 modeling reflects implementation of state measures to reduce energy use and resulting GHG emissions (e.g., SB 100, Pavley). Quantifiable features, consistent with the proposed project, including low-flow fixtures, were incorporated into the CalEEMod model. The CalEEMod output files are provided in Appendix B of this draft EIR.

For ease of comparison, electricity consumption was converted to BTUs, assuming an energy intensity of 3,416 BTU per kilowatt hour.[23] Natural gas consumption is presented in CalEEMod in the million BTU (mBTU) format. In addition, gallons of diesel and gasoline was converted to BTUs, assuming an energy intensity of 124,000 BTU per gallon of gasoline and 139,000 BTU per gallon of diesel.[24]

4.5.4.3 Impact Evaluation

Impact EN-1: The proposed project would not result in a potentially significant environmental impact due to the wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation. (*Less than Significant with Mitigation*)

Construction

Construction activities for the project would include demolition of a surface parking lot, tree removal, construction of a new office building, various site improvements, and utility installations. Construction-related energy usage would include the electricity needed to power electric construction equipment or deliver water to the construction site, the gasoline and diesel fuel used for transporting workers and materials to and from the construction site, and the fuel used for the operation of off-road equipment. Construction-related energy usage and consumption would vary throughout the course of project buildout and depend on the level of activity, the length of the construction period, the specific construction operations, the types of equipment, and the number of personnel, which could result in a ***significant*** energy impact if best management practices (BMPs) are not implemented. The estimated construction-related energy consumption for the project is provided in Table 4.5-4. As shown, project construction would consume approximately 18,502.5 million BTUs over the approximately 18-month construction period.

Table 4.5-4. Estimated Construction Energy Consumption from the Project (Million BTUs)

Construction Year	Electricity	Gasoline	Diesel	Total by Year
2020	177.4	414.9	11,036.6	11,628.9
2021	177.4	2,326.5	4,369.7	6,873.6
Total by Resource	**354.8**	**2,741.4**	**15,406.3**	**18,502.5**

Source: See Appendix B of this draft EIR for CalEEMod model outputs and construction energy calculations.

[23] Environment and Ecology. 2020. *Energy Units and Calculators*. Available: http://environment-ecology.com/what-is-energy/90-energy-units-and-calculators.html. Accessed: April 17, 2020.

[24] Ibid.

Mitigation Measure GHG-1, Require Implementation of BAAQMD-recommended Construction BMPs, would be implemented to reduce the amount of fossil fuel consumed during construction activities, such as ensuring that 15 percent of the construction vehicles/equipment fleet utilize alternative fuel (e.g., biodiesel or electricity). It would also reduce the energy intensiveness associated with new building materials and discarded construction and demolition waste by requiring construction contractors to implement the Bay Area Air Quality Management District's recommended BMPs—specifically, those associated with alternative fuel and recycling. Consequently, project construction would not result in the wasteful, inefficient, or unnecessary consumption of energy resources, and this impact would be ***less than significant with mitigation***.

Operation

Operation of the proposed project would result in the consumption of electricity, natural gas, diesel, and gasoline (e.g., for emergency generator testing, heating, cooling, landscape maintenance). Operational energy consumption was evaluated under existing-year (2019) and buildout-year (2021) conditions. The analysis considers implementation of quantifiable measures to reduce energy usage (e.g., SB 100) as well as the benefits achieved through quantifiable sustainability measures, including the use of green consumer products, such as low-flow fixtures, which are incorporated into the project design. Table 4.5-5 presents the results of the operational energy analysis (expressed in terms of million BTU, or mBTU). The project's net energy consumption is the difference in operational energy consumption between 2021 with-project conditions and existing (2019) conditions at the project site.

As shown in Table 4.5-5, below, buildout of the project would increase operational energy consumption on the project site by approximately 73,712 million BTUs compared with existing conditions. Energy use per square foot would increase slightly to 0.31 million BTU per square foot compared with the existing condition, 0.26 million BTU per square foot, despite the increase in building area (i.e., more than double). This comparatively small increase in energy usage per square foot is attributable to the energy efficiency measures to be incorporated into the project, which are described below.

The project would install Energy Star appliances, provide electric-vehicle parking spaces, and qualify for United States Green Building Council Leadership in Energy and Environmental Design (LEED) Gold certification. It would also meet South San Francisco Municipal Code and CALGreen building requirements as well as the International WELL and Fitwel Building Institute Standards.[25,26] Although the proposed project would allow for the use of natural gas appliances and heaters, all units would meet high-efficiency standards, thereby limiting the amount of natural gas consumed to the greatest extent possible. In addition, the proposed project would also incorporate solar-ready rooftop connectivity for future installation

---

[25] The proposed project would be designed to meet WELL tenant-ready standards but may not formally certify. The WELL Building Standard is a performance-based building standard for measuring and monitoring features within the built environment that may affect human health through air, water, light, and other concepts. The standards provide ways for buildings to be designed to improve human comfort and enhance health and wellness within the built environment.

[26] The Fitwel Standard includes evidence-based design and operational strategies that enhance a building's environment for its occupants. The Fitwel Standard has seven health impact categories for evaluating a building, including, but not limited to, access to healthy food, opportunities for physical activity, and promotion of occupant safety.

Table 4.5-5. Estimated Operational Energy Consumption of the Proposed Project

Condition/Source	Million BTU/Year
Existing (2019)	
701 Gateway (existing office building) and 751 Gateway (existing parking lot)	
Electricity	5,985
Natural Gas	4,467
Mobile – gasoline	30,160
Mobile – diesel	3,986
Total[a]	44,598
Proposed Project (2021)	
701 Gateway Boulevard (existing office building)	
Electricity	5,985
Natural Gas	4,467
Mobile – gasoline	28,532
Mobile – diesel	4,101
751 Gateway Boulevard (proposed R&D and office building)	
Electricity	18,764
Natural Gas	3,451
Mobile – gasoline	46,349
Mobile – diesel	6,661
Total[a]	118,310
Net Increase with Proposed Project	
2021 v. Existing	73,712
Energy per Square Foot (mBTU/SF)	
Existing (2019)	0.26
2021 with Proposed Project	0.31

Source: See Appendix B of this draft EIR for CalEEMod model outputs and mobile emissions calculations.
Note: The energy consumption amounts provided in the table reflect implementation of quantifiable state measures to reduce energy consumption (e.g., SB 100).
[a] Totals may not add up because of rounding.
mBTU/SF = million BTUs per square foot

of photovoltaic panels. Furthermore, the project would implement a robust transportation demand management program that would encourage alternatives mode of transportation to reduce single-occupant vehicle use as well as fuel consumption. This program would include, but would not be limited to, carpool and vanpool ride-matching services, a shuttle program, short- and long-term bicycle parking, free parking for carpools and vanpools, a guaranteed ride home for emergency situations, a direct route to transit, showers and lockers, a designated employer contact, information boards and kiosks, passenger loading zones, pedestrian connections, Transportation Management Association participation, and promotional programs, such as orientation packets for new tenants and employees regarding transportation alternatives, which reduce VMT and, consequently, the amount of energy (i.e., gasoline and diesel) consumed.

Based on the above analysis, operation of the project would not result in the wasteful, inefficient, or unnecessary consumption of energy resources, and this impact would be ***less than significant***. No mitigation is required. Although not required to support a less-than-significant determination or quantified for the purposes of this analysis, implementation of Mitigation Measure TR-1, as discussed in Section 4.9, *Transportation and Circulation,* of this draft EIR, would fund the project's fair share towards design and construction of off-site improvements to reduce the number of vehicle trips, which would reduce the project's annual gasoline and diesel usage. The improvements would require City acquisition of private right-of-way and funding from other sources. Should the improvements recommended in Mitigation Measure TR-1 be implemented, the project's energy usage is anticipated to be less than the amount presented in Table 4.5-5, above.

Impact EN-2: The proposed project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. (*Less than Significant*)

State and local renewable energy and energy efficiency plans that are applicable to the proposed project are discussed above under *Regulatory Framework.* State plans include the AB 1493 Pavley Rules, California Title 24 energy efficiency standards, EO B-16-12, SB 350, and SB 100. Each of these contains required standards related to energy efficiency and renewable energy development. Local plans that address energy efficiency and are designed to achieve the state's RPS mandates include PG&E's and PCE's 2018 IRPs and the City's CAP. The City's General Plan and East of 101 Area Plan also include goals and policies related to energy use and energy reductions.

As discussed above under Impact EN-1, the project would incorporate sustainability and transportation features. Furthermore, energy use by square foot would increase only slightly compared to existing conditions, despite the increase in building area that would occur (more than double). The proposed project would install Energy Star appliances and qualify for United States Green Building Council Leadership in Energy and Environmental Design (LEED) Gold certification and meet the International WELL and Fitwel Building Institute Standards. In addition, any natural gas appliance or heater installed as a result of the project would meet high-efficiency energy standards, and electric-vehicle parking spaces would be provided on-site. Furthermore, the proposed project would incorporate solar-ready rooftop connectivity for future installation of photovoltaic panels.

The project would be required to comply with state and local renewable energy and energy efficiency plans. As a result, it would benefit from renewable energy development and increases in energy efficiency. Energy usage from increases in VMT and the number of average daily trips in the area is expected to become more efficient under regulations included in Pavley and EO B-16-12, which address average fuel economy and commercialization of zero-emission vehicles, respectively. Building energy efficiency is also expected to increase as a result of compliance with Title 24 building codes, which are expected to move toward zero net energy for new construction and 100 percent renewable energy under SB 350 and SB 100 regulations. With implementation of the project, PG&E and PCE would continue to pursue the procurement of renewable energy sources to meet their RPS portfolio goals and comply with state regulations. Therefore, the proposed project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency, and the impact would be ***less than significant***. No mitigation is required.

4.5.4.4 Cumulative Impacts

The cumulative geographic context for energy is the service area of PG&E (i.e., electric and natural gas service area), which comprises the larger Northern California area and includes the PCE service area.

Impact C-EN-1: The proposed project in combination with past, present, and reasonably foreseeable projects would not result in the wasteful, inefficient, or unnecessary consumption of energy resources during construction or operation. (*Less than Significant*)

Continued growth throughout PG&E's service area could contribute to ongoing increases in demand for electricity and natural gas. These anticipated increases would be countered, in part, as state and local requirements related to renewable energy become more stringent and energy efficiency increases. The extent to which cumulative development through 2021, the project's buildout year, could result in the wasteful, inefficient, or unnecessary consumption of energy resources would depend on the specific characteristics of new development, which are not known at this time. As discussed previously, SB 100 obligates utilities to supply 100 percent carbon-free electricity by 2045; PG&E reached California's 2020 renewable energy goal 3 years ahead of schedule and is currently projected to meet the new SB 100 goal that calls for 60 percent renewable energy by 2030, also ahead of schedule. Similarly, the Pavley standards are expected to increase average fuel economy to roughly 54.5 miles per gallon by 2025, thereby lowering the demand or fossil fuels. Therefore, it is anticipated that future energy users will become more efficient and less wasteful over time.

The proposed project would be completed in 2021. Buildout of the proposed project would increase operational energy consumption on the project site by 73,710 million BTUs compared to existing conditions. However, energy use per square foot would increase only slightly to 0.31 million BTU per square foot from 0.26 million BTU per square foot, despite more than doubling the building area, because of the energy efficiency of the future building and vehicles, which would be subject to increasingly robust regulations over time to meet the state's renewable energy mandates. As discussed above in the impact analysis, the proposed project would install Energy Star appliances, incorporate high-efficiency natural gas appliances, qualify for United States Green Building Council LEED Gold certification standards, and meet South San Francisco Municipal Code and CALGreen building requirements.

Similar to the proposed project, the cumulative projects would most likely include features that would reduce energy consumption and increase renewable energy generation. For these reasons, the proposed project in combination with past, present, and reasonably foreseeable future projects would not result in a significant cumulative impact related to the wasteful, inefficient, or unnecessary consumption of energy resources. The cumulative impact would be ***less than significant***. No mitigation is required.

Impact C-EN-2: The proposed project in combination with past, present, and reasonably foreseeable projects would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. (*Less than Significant*)

Similar to the proposed project, the cumulative projects would be required to comply with all adopted state and local renewable energy and energy efficiency regulations and plans. Therefore, the proposed project in combination with past, present, and reasonably foreseeable future projects would not result in a significant cumulative impact related to conflicting with or obstructing a state or local plan for renewable energy or energy efficiency. The cumulative impact would be ***less than significant***. No mitigation is required.

4.6 Geology and Soils

4.6.1 Introduction

This section describes the environmental and regulatory setting for geology and soils. It also describes impacts associated with geology and soils that would result from implementation of the proposed project and mitigation for significant impacts where feasible and appropriate.

4.6.2 Environmental Setting

4.6.2.1 Physiography

South San Francisco comprises three distinct topographic zones: a lowland zone, primarily east of U.S. 101, underlain by deposits of bay mud up to 80 feet; an upland zone, mostly urbanized with cut and fill in some areas superimposed over alluvial soils of the Colma Creek floodplain; and a hillside zone with some slopes of more than 30 percent, with soils characterized as sandy and gravelly loams having generally high to very high erosion potential. The project site is in the lowland zone at approximately 34 to 21 feet above mean sea level. It gently slopes from west to east, toward Gateway Boulevard.

4.6.2.2 Subsurface Conditions

The project site is underlain by medium-dense to very dense sands, with some very stiff to hard clays overlying residual soil. Bedrock was encountered at depths between 40.5 feet below ground surface (bgs) and 80 feet bgs. Rock was not encountered in some borings, including boring LB-8, which extended to 101.5 feet bgs. Within the building footprint, bedrock is expected to be present approximately 40 to 75 feet bgs.

4.6.2.3 Seismicity and Seismic Hazards

Primary Seismic Hazards

Surface Fault Rupture

The project site is not located within an Alquist-Priolo earthquake fault zone and no known fault or potentially active fault exists on the project site.[1] The nearest fault is the Hillside fault, located approximately 0.3 mile south of the project site. The Hillside fault is pre-Quaternary (i.e., older than 1.6 million years or without recognized Quaternary displacement), and a review of the Quaternary Fault and Fold Database as well as the Fault Activity Map of California concluded that the Hillside fault was inactive, with the latest activity occurring at least 1.6 million years ago. In a seismically active area such as the San Francisco Bay Area, the possibility of future faulting occurring in areas where faults have not been mapped is small but the possibility exists.

[1] California Geologic Survey, 2000. San Francisco South Quadrangle Earthquake Fault Zones and Seismic Hazard Zones Map, released November 17, 2000. Available: http://gmw.conservation.ca.gov/SHP/EZRIM/Maps/SAN_FRANCISCO_SOUTH_EZRIM.pdf. Accessed May 10, 2018.

Seismic Ground Shaking

Ground shaking is the most widespread hazardous phenomenon associated with seismic activity. The project site is within a seismically active area that will most likely experience periodic minor earthquakes and a major earthquake (i.e., moment magnitude greater than 6) on one of the nearby faults during the service life of the project. Table 4.6-1 identifies the major faults in the project area and their distance from the project site. The San Andreas, Hayward, and Calaveras faults are the most active and have the highest probability of experiencing a magnitude 6.7 or greater earthquake in the next 30 years.

Table 4.6-1. Regional Faults and Seismicity

Fault Segment	Approximate Distance from Project Site (mile)	Direction from Project Site	Mean Moment Magnitude
N. San Andreas – Peninsula	3.1	West	7.2
N. San Andreas (1906 event)	3.1	West	8.05
San Gregorio Connected	8.7	West	7.5
N. San Andreas – North Coast	13.0	Northwest	7.5
Total Hayward	14.9	Northeast	7.0
Total Hayward-Rodgers Creek	14.9	Northeast	7.3
Monte Vista-Shannon	17.4	Southeast	6.5
Total Calaveras	23.6	East	7.0
Mount Diablo Thrust	34.9	Northeast	6.7
Green Valley Connected	28	Northeast	6.8
Rodgers Creek	29.8	North	7.1
Point Reyes	31.1	Northwest	6.9

Source: Langan Engineering and Environmental Services, Inc. 2019. Geotechnical Investigation, 751 Gateway Boulevard, South San Francisco, CA 75065-1501. November. Oakland, CA.

The San Andreas fault is the nearest active fault to the project site. Since 1800, four major earthquakes have been recorded on the San Andreas fault. The Hayward fault experienced a major earthquake in 1868, and the Calaveras experienced significant earthquakes in 1861 and 1984. The 2014 Working Group on California Earthquake Probabilities forecast that there is a 72 percent chance that an earthquake with a magnitude 6.7 or greater in the San Francisco Bay Area over the next 30 years.[2] The intensity of earthquake ground motion at the project site would depend on the characteristics of the generating fault, the distance to the earthquake epicenter, the magnitude, and the duration of the earthquake.

[2] The 2014 Working Group on California Earthquake Probabilities (2015). "UCERF3: A new earthquake forecast for California's complex fault system", U.S. Geological Survey 2015–3009, 6 p., http://dx.doi.org/10.3133/fs20153009.

Secondary Seismic Hazards

Liquefaction

Liquefaction occurs when saturated soils lose cohesion, strength, and stiffness with applied shaking, such as that from an earthquake. The lack of cohesion causes solid soil to behave like a liquid, resulting in ground failure. When a load such as a structure is placed on ground that is subject to liquefaction, ground failure can result in the structure sinking and soil being displaced. Ground failure can take on many forms, including flow failures, lateral spreading, lowering of the ground surface, ground settlement, loss of bearing strength, ground fissures, and sand boils. Liquefaction within subsurface layers, which can occur during ground shaking associated with an earthquake, can also result in ground settlement.

The project site is within an area that has not been evaluated for liquefaction or seismic landslides by the California Geological Survey. The Health and Safety Element of the General Plan notes that a large portion of the City, primarily east of U.S. 101, is underlain by deposits of bay mud, up to 80 feet deep in some places, that could be subject to liquefaction. The geotechnical investigation prepared for the project concluded that some of the subsurface soil layers could liquefy during an earthquake, resulting in settlement on the order of 1 inch. The liquefiable layers do not appear to be continuous and would not create bearing issues for the foundation. However, liquefaction could lead to differential settlement.

Lateral Spreading

Lateral spreading is a phenomenon in which a surficial soil displaces along a shear zone that formed within an underlying liquefied layer. The surficial blocks are transported downslope or in the direction of a free face, such as a bay, by earthquake and gravitational forces. Lateral spreading is generally the most pervasive and damaging type of liquefaction-induced ground failure generated by earthquakes. San Mateo County, where the project site is located, has not been evaluated for seismic hazard zones for liquefaction or seismic landslides.[3] The geotechnical investigation prepared for the project indicated that soils would need to consist of saturated, cohesionless sandy sediments for significant lateral spreading to occur. In general, the potentially liquefiable soils underlying the project site consist of clayey and silty sands that are not likely to be continuous beneath the site. Therefore, the potential for lateral spreading at the project site is low.

4.6.2.4 Expansive Soils and Weak Soils

Seismic densification can occur when strong ground shaking in loose, clean granular deposits above the water table results in ground surface settlement. The geotechnical investigation prepared for the project encountered approximately 13 feet of medium-dense to dense sand above the water table and estimated that up to 0.5 inch of settlement could occur because of seismic densification. However, the maximum predicted amount does not necessarily occur at the same locations. Laboratory testing performed on near-surface samples of clay indicates that the site has low expansion potential,[4] with plasticity indices of 7 to 15. The geotechnical investigation prepared for the project indicated that the project site has a low expansion potential.

---

[3] California Geological Survey. 2020. *Earthquake Zones of Required Investigation*. Available: https://maps.conservation.ca.gov/cgs/EQZApp/app/. Accessed: June 4, 2020.

[4] Expansive soil undergoes volume changes with changes in moisture content.

4.6.2.5 Landslides

Landslides occur when the stability of a slope changes from a stable to an unstable condition. The stability of a slope is affected by the following primary factors: inclination, material type, moisture content, orientation of layering, and vegetative cover. In general, steeper slopes are less stable than more gently inclined ones. San Mateo County, where the project site is located, has not been evaluated for seismic hazard zones for seismic landslides. In South San Francisco, the highest landslide risk is near the south flank of San Bruno Mountain, which is approximately 1.5 miles north of the project site. The project site, which is approximately 34 to 21 feet above mean sea level, slopes gently from west to east, toward Gateway Boulevard. Therefore, due to the distance between the project site and potential landslide areas, the likelihood of a landslide at the project site is low.

4.6.2.6 Paleontological Resources

Geologic units present at the project site are older Holocene- and Pleistocene-aged continental and marine deposits (Qc) at ground surface and the Franciscan Formation, specifically sandstone, shale, and conglomerate (KJfss), at depth.[5] The Holocene- and Pleistocene-aged continental and marine deposits consist of sand, silt, clay, and gravel and include the Colma Formation, as at the project site.[6] The Colma Formation is a gravelly, sandy clay.[7] The Franciscan Formation consists of chaotic mixtures of rock masses in a sheared matrix.

The older Holocene- and Pleistocene-aged continental and marine deposits include the Colma Formation, which is known to have yielded vertebrate fossils.[8] At a site on Pacific Avenue in San Francisco, *Mammuthus* (an extinct genus that belongs to the order of trunked mammals, including mammoth) and *Bison* (bison) fossils were recovered. Furthermore, vertebrate paleontological resources have been recovered from sites in South San Francisco from sediments of a similar age. The University of California Museum of Paleontology identified remains of *Alces* (moose and elk) and *Equus* (horse, donkey, and zebra) in this area.[9]

The geotechnical investigation identified the Franciscan Formation at depths exceeding the maximum depth of excavation; however, because the project site is adjacent to a surface exposure of the Franciscan Formation, it is possible that this unit could underlie areas of proposed excavation. Paleontological resources records have identified significant fossils in the Franciscan Formation.[10] Vertebrate paleontological resources recovered from this unit include *Ichthyosaurus* (San Joaquin County) and *Plesiosaurus* (San Luis Obispo County). Although vertebrate fossils are uncommon in this geologic unit, fossils have been important in understanding formation of the Franciscan Formation.[11]

---

5 Wagner, D.L., E.J. Bortugno, and R.D. McJunkin. 1991. *Geologic Map Explanation of the San Francisco-San Jose Quadrangle, California, 1991*. Available: ftp://ftp.consrv.ca.gov/pub/dmg/pubs/rgm/RGM_005A/RGM_005A_SanFrancisco-SanJose_1991_Sheet2of5.pdf. Accessed: March 12, 2020.

6 Ibid.

7 Rodda, P.U., and N. Baghai. 1993. Late Pleistocene Vertebrates from Downtown San Francisco, California. *Journal of Paleontology* 67(5):1058–1063.

8 Ibid.

9 University of California Museum of Paleontology. 2020. *Advanced Specimen Search, San Mateo County*. Available: https://ucmpdb.berkeley.edu/advanced.html. Accessed: March 12, 2020.

10 University of California Museum of Paleontology. 2020. *Advanced Specimen Search, Franciscan Formation.* Available: https://ucmpdb.berkeley.edu/advanced.html. Accessed: March 12, 2020.

11 Wakabayashi, J. 1992. Nappes, Tectonics of Oblique Plate Convergence, and Metamorphic Evolution Related to 140 Million Years of Continuous Subduction, Franciscan Complex, California. *The Journal of Geology* 100:1(19-40). Chicago, IL: University of Chicago Press.

4.6.3 Regulatory Framework

4.6.3.1 Federal

Earthquake Hazard Reduction Act of 1977

Federal laws codified in United States Code Title 42, Chapter 86, were enacted to reduce risks to life and property from earthquakes in the United States through the establishment and maintenance of an effective earthquake hazards reduction program. Implementation of the requirements are regulated, monitored, and enforced at the state and local levels.

4.6.3.2 State

The Alquist-Priolo Earthquake Fault Zoning Act of 1972

The Alquist-Priolo Earthquake Fault Zoning Act of 1972 (Alquist-Priolo Act) (PRC Section 2621 et seq.) is intended to reduce the risk to life and property from surface fault rupture during earthquakes. The Alquist-Priolo Act prohibits the location and construction of most types of structures intended for human occupancy[12] over active fault traces and strictly regulates construction in corridors along active faults. The California state geologist has established regulatory zones along active faults,[13] called "earthquake fault zones," and published maps that identify areas where surface traces of active faults are present.[14]

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act of 1990 (PRC Sections 2690–2699.6) directs the California Geological Survey to identify and map areas that are prone to liquefaction and landslides resulting from seismic evens. The act mandates project sponsors to have a site-specific geotechnical investigation performed to identify potential seismic hazards and formulate mitigation measures prior to permitting most developments within specific zoned areas.

California Building Standards Code

The California Building Standards Code, or state building code, is codified in CCR Title 24. The state building code provides standards that must be met to safeguard life and limb, health, property, and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, location, and maintenance of all buildings and structures within the state. The state building code generally applies to all occupancies in California, with modifications adopted in some instances by state agencies or local governing bodies. The current state building code incorporates, by adoption, the 2018 edition of the International Building Code of the International Code Council, with California amendments. These amendments include building design and construction criteria that have been tailored for California earthquake conditions.

---

[12] With reference to the Alquist-Priolo Act, a structure for human occupancy is defined as one "used or intended for supporting or sheltering any use or occupancy that is expected to have a human occupancy rate of more than 2,000 person-hours per year" (CCR, Title 14, Division 2, Section 3601[e]).

[13] An active fault, for the purposes of the Alquist-Priolo Act, is one that has ruptured in the past 11,000 years.

[14] California Geological Survey. 2020. *The Alquist-Priolo Earthquake Fault Zoning Act*. Available: http://www.conservation.ca.gov/cgs/rghm/ap. Accessed: March 17, 2020.

Chapter 16 of the state building code deals with structural design requirements governing seismically resistant construction (Section 1604), including, but not limited to, factors and coefficients used to establish a seismic site class and seismic occupancy category appropriate for the soil/rock at the building location and the proposed building design (Sections 1613.5 through 1613.7). Chapter 18 includes, but is not limited to, the requirements for foundation and soil investigations (Section 1803); excavation, grading, and fill (Section 1804); allowable load-bearing values of soils (Section 1806); foundations and retaining walls (Section 1807); and foundation support systems (Sections 1808 through 1810). Chapter 33 includes, but is not limited to, requirements for safeguards at work sites to ensure stable excavations and cut-and-fill slopes (Section 3304) as well as the protection of adjacent properties, including requirements for noticing (Section 3307). Appendix J of the state building code includes, but is not limited to, grading requirements for the design of excavation and fill (Sections J106 and J107), specifying maximum limits on the slope of cut-and-fill surfaces and other criteria, required setbacks and slope protection for cut-and-fill slopes (J108), and erosion control through the provision of drainage facilities and terracing (Sections J109 and J110).

California Division of Occupational Safety and Health Regulations

Construction activities are subject to occupational safety standards pertaining to excavation, shoring, and trenching, as specified in California Division of Occupational Safety and Health regulations (Title 8).

State Historic Significance Criteria

As discussed in Section 4.7.5.2, Significance Criteria, Appendix G of the California Environmental Quality Act (CEQA) Guidelines includes the following question: "Would the project directly or indirectly destroy a unique paleontological resource or site?" Although CEQA does not define what constitutes "a unique paleontological resource or site," Section 21083.2 defines *unique archaeological resources* as "an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
- Has a special and particular quality, such as being the oldest of its type or the best available example of its type.
- Is directly associated with a scientifically recognized important prehistoric or historic event or person."

This definition is equally applicable to recognizing a unique paleontological resource or site. CEQA Section 15064.5(a)(3)(D) provides additional guidance, indicating that, generally, a resource shall be considered historically significant if it has yielded, or may be likely to yield, information important in prehistory or history.

The CEQA lead agency having jurisdiction over a project is responsible for ensuring that paleontological resources are protected in compliance with CEQA and other applicable statutes. PRC Section 21081.6, Mitigation Monitoring Compliance and Reporting, requires the CEQA lead agency to demonstrate project compliance with the mitigation measures developed during the environmental impact review process.

4.6.3.3 Local

South San Francisco General Plan

The 1999 General Plan provides a vision for long-range physical and economic development of the City, provides strategies and specific implementing actions, and establishes a basis for judging whether specific development proposals and public projects are consistent with the City's plans and policy standards. The 1999 General Plan provides a vision for long-range physical and economic development of the City, provides strategies and specific implementing actions, and establishes a basis for judging whether specific development proposals and public projects are consistent with the City's plans and policy standards. The General Plan contains a Health and Safety Element, which acknowledges and mitigates the risks posed by hazards (e.g., fire). The General Plan includes the following policy applicable to seismic activity and geologic hazards:

- Policy 8.1-G-1: Minimize the risk to life and property from seismic activity and geologic hazards in South San Francisco.

City of South San Francisco Building Code

The City Building Division enforces the minimum standards found in the various codes adopted by the state through the Building Standards Commission and as adopted and amended by the City Council. In particular, the City adopted by reference the California Building Standards Code, volumes 1 and 2 (2019 edition), as the building code for the City of South San Francisco.[15]

East of 101 Area Plan[16]

The *East of 101 Area Plan*, which was adopted in 1994 and most recently amended in 2016, sets forth specific land use policies for the East of 101 Area. The City interprets the *East of 101 Area Plan* as a design-level document. Per Policy IM-5, the *Gateway Specific Plan* is not affected by the land use regulations of the *East of 101 Area Plan*. Therefore, the policies in the General Plan Health and Safety Element are the guiding policies and supersede all Geotechnical Safety Element policies set forth in Chapter 10 of the *East of 101 Area Plan*. Nonetheless, applicable policies from the *East of 101 Area Plan* Geotechnical Safety Element are as follows:

- Policy GEO-1: The City shall assess the need for geotechnical investigations on a project-by-project basis on site in areas of fill shown on Figure 17, and shall require such investigations where needed.
- Policy GEO-2: Where fill remains under a proposed structure, project developers shall design and construct appropriate foundations.
- Policy GEO-7: New slopes greater than 5 feet in height, either cut in native soils or rock, or created by placing fill material, shall be designed by a geotechnical engineer and should have an appropriate factor of safety under seismic loading. If additional load is to be placed at the top of the slope, or if extending a level area at the toe of the slope requires removal of part of the slope, the proposed configuration shall be checked for an adequate factor of safety by a geotechnical engineer.

---

[15] South San Francisco Municipal Code Section 15.08.010.

[16] City of South San Francisco. 1994. East of 101 Area Plan. Prepared by Brady and Associates. Available: https://www.ssf.net/home/showdocument?id=508. Accessed: May 8, 2020.

- Policy GEO-8: The surface of fill slopes shall be compacted during construction to reduce the likelihood of surficial sloughing. The surface of cut or fill slopes shall also be protected from erosion due to precipitation or runoff by introducing a vegetative cover on the slope or by other means. Runoff from paved and other levels areas at the top of the slope shall be directed away from the slope.
- Policy GEO-10: In fill areas mapped on Figure 17, a geotechnical investigation to determine the true nature of the subsurface materials and the possible effects of liquefaction shall be conducted by the project developer before development.
- Policy GEO-11: Development shall be required to mitigate the risk associated with liquefaction.
- Policy GEO-12: Structural design of buildings and infrastructure shall be conducted according to the Uniform Building Code and appropriate local codes of practice which specify procedures and details to reduce the effects of ground shaking on structures.

4.6.4 Impacts and Mitigation Measures

4.6.4.1 Significance Criteria

Based on Appendix G of the CEQA Guidelines, the proposed project would have a significant geology and soils impact if it would:

- Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:
  - 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.);
  - Strong seismic ground shaking;
  - Seismically related ground failure, including liquefaction;
  - Landslides;
- Result in substantial soil erosion or the loss of topsoil;
- 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 onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse;
- 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;
- 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 wastewater; or
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

4.6.4.2 Approach to Analysis

Evaluation of the proposed project is based on the geotechnical investigation prepared for the project, unless otherwise noted.[17] The geotechnical investigation concluded that the proposed project is feasible from a geotechnical standpoint, provided the recommendations included in the investigation are incorporated into project plans and specifications.

In the *California Building Industry Association v. Bay Area Air Quality Management District* case, decided in 2015,[18] the California Supreme Court held that CEQA does not generally require lead agencies to consider how existing environmental conditions might affect a project, except where the project would significantly exacerbate an existing environmental condition. Accordingly, placing new development in an existing or future seismic hazard area or an area with unstable soils is not considered an impact under CEQA unless the project would significantly exacerbate the seismic hazard or unstable soil conditions. Therefore, the analysis below evaluates whether the proposed project would exacerbate existing or future seismic hazards or unstable soils at the project site and result in a substantial risk of loss, injury, or death.

Paleontological Resources

The *Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources* (Procedures)[19] of the Impact Mitigation Guidelines Revision Committee of the Society of Vertebrate Paleontology include procedures for the investigation, collection, preservation, and cataloging of fossil-bearing sites. This includes the designation of paleontological sensitivity. The Procedures are widely accepted among paleontologists and followed by most investigators. The Procedures identify two key phases of paleontological resource protection, (1) assessment and (2) implementation. Assessment involves identifying the potential for a project site or area to contain significant, nonrenewable paleontological resources that could be damaged or destroyed by project excavation or construction. Implementation involves formulating and applying measures to reduce such adverse effects.

For the assessment phase, the Society of Vertebrate Paleontology uses one of four sensitivity categories for sedimentary rocks (i.e., high, undetermined, low, no potential) to define the level of potential.[20]

- **High Potential**. Assigned to geologic units from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered as well as sedimentary rock units suitable for the preservation of fossils (middle Holocene and older fine-grained fluvial sandstones, fine-grained marine sandstones, etc.). Paleontological potential refers to the potential for yielding abundant fossils, a few significant fossils, or recovered evidence for new and significant taxonomic, phylogenetic, paleoecologic, taphonomic, biochronologic, or stratigraphic data.

---

[17] Langan Engineering and Environmental Services, Inc. 2019. *Geotechnical Investigation, 751 Gateway Boulevard, South San Francisco*, CA 75065-1501. November. Oakland, CA.

[18] *California Building Industry Association v. Bay Area Air Quality Management District*, 62 Cal.4th 369. Opinion filed December 17, 2015. Available: https://caselaw.findlaw.com/ca-supreme-court/1721100.html. Accessed: March 13, 2020.

[19] Society of Vertebrate Paleontology. 2010. *Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources*. Available: http://vertpaleo.org/Membership/Member-Ethics/SVP_Impact_ Mitigation_Guidelines.aspx. Accessed: March 12, 2020.

[20] Ibid.

- **Undetermined Potential**. Assigned to geologic units for which little information is available concerning their paleontological content, geologic age, and depositional environment. In cases where no subsurface data already exist, paleontological potential can sometimes be assessed by subsurface site investigations.
- **Low Potential.** Field surveys or paleontological research may determine that a geologic unit has low potential for yielding significant fossils (e.g., basalt flows).
- **No Potential**. Some geologic units have no potential to contain significant paleontological resources (e.g., high-grade metamorphic rocks [gneisses and schists] and plutonic igneous rocks [granites and diorites]).

The methods used to analyze potential impacts on paleontological resources and develop mitigation for the identified impacts followed the Society of Vertebrate Paleontology's Procedures.

- Assessment
  - Identify the geologic units that would be affected by the project, based on the project's depth of excavation—either at the ground surface or below the ground surface, defined as at least 5 feet below the ground surface.
  - Evaluate the potential of the identified geologic units to contain significant fossils (paleontological sensitivity).
  - Identify impacts on paleontologically sensitive geologic units as a result of near-term and longer-term construction and operation that involve ground disturbance.
  - Evaluate impact significance.
- Implementation
  - According to the identified degree of sensitivity, formulate and implement measures to mitigate potential impacts.

The potential of the project to affect paleontological resources is related to ground disturbance. Geologic units at the project site were identified through California Geological Survey regional maps.[21] A determination regarding the presence of paleontological resources in the units was based on the fossil record, as documented by the University of California Museum of Paleontology.[22,23]

After the records search, the paleontological sensitivity of the units was assessed according to the Procedures.[24]

---

[21] Wagner, D.L., E.J. Bortugno, and R.D. McJunkin. 1991. *Geologic Map of the San Francisco-San Jose Quadrangle, California, 1:250,000.* Available: ftp://ftp.consrv.ca.gov/pub/dmg/pubs/rgm/RGM_005A/RGM_005A_SanFrancisco-SanJose_1991_Sheet1of5.pdf. Accessed: March 12, 2020.

[22] University of California Museum of Paleontology. 2020. *Advanced Specimen Search, San Mateo County.* Available: https://ucmpdb.berkeley.edu/advanced.html. Accessed: March 12, 2020.

[23] University of California Museum of Paleontology. 2020. *Advanced Specimen Search, Franciscan Formation.* Available: https://ucmpdb.berkeley.edu/advanced.html. Accessed: March 12, 2020.

[24] Society of Vertebrate Paleontology. 2010. *Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources.* Available: http://vertpaleo.org/Membership/Member-Ethics/SVP_Impact_Mitigation_Guidelines.aspx. Accessed: March 12, 2020.

For the purposes of this analysis, an impact on paleontological resources was considered significant, thereby requiring mitigation, if it would result in any of the following:

- Damage to, or destruction of, vertebrate paleontological resources.
- Damage to, or destruction of, any paleontological resource that:
  - Provides important information about evolutionary trends, including the development of biological communities;
  - Demonstrates unusual circumstances in the history of life;
  - Represents a rare taxon or a rare or unique occurrence;
  - Is in short supply and in danger of being destroyed or depleted;
  - Has a special and particular quality, such as being the oldest of its type or the best available example of its type; or
- Provides information used to correlate strata for which it may be difficult to obtain other types of age information.

4.6.4.3 Impact Evaluation

Impact GEO-1: The proposed project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic ground shaking, seismically related ground failure, including liquefaction, or landslides. (*Less than Significant*)

Fault Rupture

As discussed in Section 4.6.2.3, *Seismicity and Seismic Hazards*, the project site is not within an Alquist-Priolo earthquake fault zone, and no known potentially active fault exists in the vicinity of the project site. In addition, the geotechnical investigation found no evidence of active faulting on the project site and concluded that the risk of surface faulting and consequent secondary failure from previous unknown faults is very low. Therefore, the project would not exacerbate the risk of surface fault rupture and this impact would be ***less than significant***. No mitigation is required.

Ground Shaking

As discussed in Section 4.6.2.3, *Seismicity and Seismic Hazards*, the project site is in a seismically active area. The project site is expected to experience strong to violent ground shaking during a major earthquake.[25] However, the proposed project would comply with the California Building Standards Code's seismic requirements, which were established to reduce risks to life from damage to newly constructed buildings due to seismic hazards. Therefore, the project would not exacerbate the risk of ground shaking resulting from a seismic and this impact would be ***less than significant***. No mitigation is required.

[25] A "strong" earthquake is defined on the Modified Mercalli Intensity scale as an VI. It would be felt by all and cause damage to weak plaster, adobe buildings, and some masonry buildings. A "violent" earthquake is defined on the Modified Mercalli Intensity scale as a IX. It could cause some masonry buildings to collapse and other buildings shift off their foundations (see http://resilience.abag.ca.gov/shaking/mmi/).

Soil Liquefaction

As discussed in Section 4.6.2.3, *Seismicity and Seismic Hazards*, the project site is within an area that is underlain by deposits of bay mud. The geotechnical investigation concluded that some underlying layers could liquefy during an earthquake. Therefore, the geotechnical investigation recommends that the building foundation be designed to accommodate localized settlement under the building footprint (i.e., up to 1 inch of differential liquefaction settlement between column locations). The proposed project would comply with the recommendations in the geotechnical investigation and standard regulatory requirements—including completion of a detailed geotechnical investigation required by the California Building Code, which are adopted by reference under the South San Francisco Building Code—and, therefore, would result in a ***less-than-significant*** impact related to seismically related ground failure, including liquefaction. No mitigation is required.

Seismic Densification

As discussed in Section 4.6.2.4, *Expansive Soils and Weak Soils*, the project site is underlain by approximately 13 feet of medium-dense to dense sand above the water table. This could result in seismically induced settlement of up to 2 inches within the proposed building footprint and 1 inch outside the proposed building footprint. Therefore, the geotechnical investigation recommends that the building foundation be designed to accommodate localized settlement under the building footprint and entrances be designed to accommodate settlement. The proposed project would comply with the recommendations in the geotechnical investigation and standard regulations required by the California Building Code, which are adopted by reference under the South San Francisco Building Code—and, therefore, would result in a ***less-than-significant*** impact related to densification-induced settlement. No mitigation is required.

Lateral Spreading

As discussed in Section 4.6.2.3, *Seismicity and Seismic Hazards*, the clayey and silty sands underlying the project site are not likely to be continuous; therefore, the potential for lateral spreading at the project site is low. The proposed project would comply with standard regulatory requirements—including completion of a detailed geotechnical investigation required by the California Building Code, which are adopted by reference under the South San Francisco Building Code—and, therefore, would result in a ***less-than-significant*** impact related to lateral spreading. No mitigation is required.

Landslides

As discussed in Section 4.6.2.5, *Landslides*, the project site has a gentle slope. It is not located in a landslide risk area; therefore, the potential for a landslide occurring at or near the project site is low. The proposed project would comply with standard regulatory requirements—including completion of a detailed geotechnical investigation required by the California Building Code, which is adopted by reference under the South San Francisco Building Code—and, therefore, would result in a ***less-than-significant*** impact related to landslides. No mitigation is required.

Impact GEO-2: The proposed project would not result in substantial soil erosion or the loss of topsoil. (*Less than Significant*)

The project site, which is approximately 34 to 21 feet above mean sea level, slopes gently from west to east, toward Gateway Boulevard. The proposed project would require grading or disturbing an area of approximately 149,000 square feet during construction and excavating approximately 1,850 cubic yards of soil that would be reused as fill on the site. The proposed project would not involve substantial changes to the existing grade, and no unprotected, exposed soils at risk of substantial erosion would remain on the project site. As discussed in Section 4.10.4, *Hydrology*, construction activities associated with the proposed project must comply with the National Pollutant Discharge Elimination System (NPDES) Construction General Permit, the Municipal Regional Permit (MRP), and City's General Plan and Municipal Code. These requirements include preparation and implementation of a stormwater pollution prevention plan (SWPPP) that incorporates best management practices (BMPs), such as the installation of erosion control measures (e.g., silt fences, staked straw bales/wattles, silt/sediment basins or traps), geofabric, sandbag dikes, covers for stockpiles, or storage precautions for outdoor material storage areas. Furthermore, the proposed project would comply with the City's standard conditions of approval, which requires a grading permit prior to any onsite grading. The City's grading permit requires applicants to have erosion control measures in place, such as de-silting basins, silt fences, asphaltic emulsions, hay bales, fabric and sand filters, swales, and/or sumps. Therefore, with adherence to the BMPs included in the SWPPP, compliance with the City's standard conditions of approval regarding grading, and compliance with the California Building Standards Code, impacts related to soil erosion would be ***less than significant***. No mitigation is required.

Impact GEO-3: The proposed project would not be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project. (*Less than Significant*)

As discussed under Impact GEO-1, some of the layers below the water table could be susceptible to liquefaction, resulting in settlement on the order of 1 inch after a seismic event. In addition, seismic densification could occur in the 13 feet of medium-dense to dense sand above the water table, resulting in about 0.5 inch of settlement. The geotechnical investigation estimated up to 2 inches of seismically induced settlement could occur within the proposed building footprint and 1 inch could occur outside the proposed building footprint.

Sand boils and liquefaction-related ground fissures can occur when surface layers above the liquefiable soils are thin. Although liquefiable layers have been identified in borings, they are not continuous and are located 20, 30, 45, and/or 60 feet below ground surface. Therefore, the potential of sand boils or fissures during a seismic event is low.

Lateral spreading is a phenomenon in which a surficial soil displaces along a shear zone that formed within an underlying liquefied layer. As discussed under Impact GEO-1, the geotechnical investigation determined that the potential for lateral spreading at the project site is low and instability would not occur as a result of the project.

Weak soils can compress or subside under the weight of buildings and fill, causing settlement relative to the thickness of the weak soil. Usually the thickness of weak soil will vary, and differential settlement will occur. Weak soils also tend to amplify shaking during an earthquake and can be susceptible to liquefaction. The geotechnical investigation determined that the native soil at the foundation level of the project site has moderate to high strength and relatively low compressiblity. Therefore, the potential for settlement resulting from soil compression at the project site is low.

Dewatering, if it is extensive, can result in subsidence. To account for seasonal fluctuations in the groundwater level, the geotechnical investigation considered groundwater levels to be approximately 7.5 to 18.5 feet below ground surface.[26] To accommodate utility trenches, the project would require a maximum depth of excavation reaching approximately 9 feet below ground surface. Given the range of groundwater elevation (7.5 feet to 18.5 feet below ground surface), the proposed depth of excavation (9 feet), the specific areas of excavation, and the limited duration of trenching activities, it is unlikely that groundwater would be encountered during project construction. Therefore, construction dewatering is not anticipated. Nonetheless, if excavation is performed during the wet season, the contractor would be prepared for dewatering. Because any dewatering would be limited in geographic extent, in the unlikely event that dewatering is needed, the amount of groundwater removed would be so small as not to pose a risk of subsidence.

The proposed project would comply with the recommendations in the geotechnical investigation regarding the design of foundations, floor slabs, and other geotechnical aspects of this project. In addition, the proposed project would comply with regulations required by the California Building Code, which are adopted by reference under the South San Francisco Building Code. Therefore, impacts related to potential liquefaction, lateral spreading, soil compression, and settlement and subsidence due to dewatering in soil that is unstable, or could become unstable as a result of such construction, would be ***less than significant***. No mitigation is required.

Impact GEO-4: The proposed project would not 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. (*Less than Significant*)

As discussed in Section 4.6.2.4, *Expansive Soils and Weak Soils*, near-surface samples of clay from the project site indicated that the site has low expansion potential, with plasticity indices of 7 to 15. The geotechnical investigation prepared for the project indicated that the project site has low expansion potential. The proposed project would comply with standard regulatory requirements—including completion of a detailed geotechnical investigation required by the California Building Code, which are adopted by reference under the South San Francisco Building Code—and, therefore, would result in a ***less-than-significant*** impact related to expansive soils. No mitigation is required.

Impact GEO-5: The proposed project would not have soils that would be incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater. (*No Impact*)

The proposed project would connect to South San Francisco's sewer and stormwater collection and treatment system. Therefore, the proposed project would not use a septic or alternative water disposal system and would have ***no impact***. No mitigation is required.

26 According to Langan Engineering and Environmental Services, the preparer of the geotechnical investigation for the proposed project, the shallowest groundwater expected during the life of the project would be 7.5 feet below ground surface. This estimate does not account for seal level rise. Ultimately, groundwater levels will depend on season and precipitation.

Impact GEO-6: The proposed project could directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. (*Less than Significant with Mitigation*)

As discussed in Section 4.6.2.6, *Paleontological Resources*, both geologic units underlying the project site are known to have yielded significant fossils. The Colma Formation has yielded vertebrate fossils, and the Franciscan Formation has yielded fossils that are important in understanding this geologic unit. Therefore, the paleontological sensitivity of these geologic units is high, and both have the potential to contain significant fossils.

Because paleontological resources are located below the ground surface, ground disturbances such as excavating, grading, and resurfacing can affect any paleontological resources that may be present. The proposed project would require grading or disturbing an area of approximately 149,000 square feet during construction. The proposed project would excavate approximately 1,850 cubic yards of soil that would be reused as fill on-site and would import an additional 750 cubic yards of soil to be used as fill on-site. To accommodate utility trenches, the project would require a maximum depth of excavation reaching approximately 9 feet below ground surface. Therefore, project construction would disturb geologic units with high paleontological sensitivity. Destruction of any paleontological resources present at the project site would constitute a ***significant*** impact. Implementation of Mitigation Measure GEO-1, Halt Construction Activity, Evaluate Find, and Implement Mitigation for Paleontological Resources, would reduce this significant impact on paleontological resources to ***less than significant with mitigation*** by providing training for construction personnel related to the possibility of encountering fossils. Construction personnel would learn the required actions to take in response to fossil discoveries, such as ceasing all earthmoving activities within 25 feet of any potential fossil find and providing for the recovery of fossils at the project site.

Mitigation Measure GEO-1: Halt Construction Activity, Evaluate Find, and Implement Mitigation for Paleontological Resources

In the event that previously unidentified paleontological resources are uncovered during site preparation, excavation, or other construction activity, the project sponsor shall cease or ensure that all such activity within 25 feet of the discovery cease until the resources have been evaluated by a qualified professional, and specific measures can be implemented to protect these resources in accordance with sections 21083.2 and 21084.1 of the California Public Resources Code. If the find is significant, a qualified paleontologist shall excavate the find in compliance with state law, keeping project delays to a minimum. If the qualified paleontologist determines the find is not significant then proper recordation and identification shall ensue and the project will continue without delay.

4.6.4.4 Cumulative Impacts

Impact C-GEO-1: The project, in combination with past, present, and reasonably foreseeable future projects, would not result in a significant cumulative impact on geology and soils. (*Less than Significant*)

In general, a project's potential impacts related to geology and soils are individual and localized, depending on the project site and underlying soils. Each structure will have different levels of excavation, cut-and-fill work, and grading, which would affect local geologic conditions in different ways. Therefore, the geographic context for geology and soils is site-specific. The cumulative projects located within approximately 0.5 mile of the project site are described in Section 4.1.5, *Approach to Cumulative Impact Analysis*, in this draft EIR and shown in Figure 4.1-1.

The cumulative projects would be required to go through environmental and regulatory review and comply with the California Building Code. Each project would also be required to have a site-specific geotechnical investigation performed, which would provide design recommendations to reduce each project's impacts. Similar seismic safety standards and conditions of approval would apply to the reasonably foreseeable future projects. For these reasons, the proposed project, in combination with other past, present, and reasonably foreseeable future projects, would not result in a significant cumulative geology and soils impact. The cumulative impact would be ***less than significant***. No mitigation is required.

Impact C-GEO-2: The proposed project would not result in a cumulatively considerable contribution to significant cumulative impacts on paleontological resources. (*Less than Significant with Mitigation*)

The geographic context for paleontology is specific to the geologic unit(s) affected. The cumulative projects located within approximately 0.5 mile of the project site are described in Section 4.1.5, *Approach to Cumulative Impact Analysis*, in this draft EIR and shown in Figure 4.1-1. The cumulative projects could encounter paleontological resources. Depending on mitigation adopted for the cumulative projects, the cumulative impact could be ***significant***. If paleontological resources are discovered during project construction, implementation of Mitigation Measure GEO-1 would ensure that the proposed project's contribution to cumulative impacts paleontological resources would be ***less than cumulatively considerable with mitigation*** because it would require compliance with state law, which would ensure that any information that can be recovered from any recovered paleontological resources would be recorded and the find itself properly curated.

4.7 Greenhouse Gas Emissions

4.7.1 Introduction

This section describes the environmental and regulatory setting for greenhouse gas (GHG) emissions. It also describes impacts associated with GHG emissions that would result from implementation of the proposed project and mitigation for significant impacts where feasible and appropriate.

4.7.2 Environmental Setting

4.7.2.1 Global Climate Change

The process known as the *greenhouse effect* keeps the atmosphere near Earth's surface warm enough for the successful habitation of humans and other life forms. The greenhouse effect is created by sunlight that passes through the atmosphere. Some of the sunlight striking Earth is absorbed and converted to heat, which warms the surface. The surface emits a portion of this heat as infrared radiation, some of which is re-emitted toward the surface by GHGs. Human activities that generate GHGs increase the amount of infrared radiation absorbed by the atmosphere, thereby enhancing the greenhouse effect and amplifying the warming of Earth.

Increases in fossil fuel combustion and deforestation have exponentially increased concentrations of GHGs in the atmosphere since the Industrial Revolution.[1] Rising atmospheric concentrations of GHGs in excess of natural levels result in increasing global surface temperatures—a process commonly referred to as *global warming*. Higher global surface temperatures, in turn, result in changes to Earth's climate system, including increases in ocean temperatures and acidity, less sea ice, variable precipitation, and increased frequencies and intensities for extreme weather events.[2] Large-scale changes to Earth's system are collectively referred to as *climate change.*

The Intergovernmental Panel on Climate Change (IPCC) was established by the World Meteorological Organization and United Nations Environment Programme to assess scientific, technical, and socioeconomic information relevant to the understanding of climate change, its potential impacts, and options for adaptation and mitigation. The IPCC estimates that human-induced warming reached approximately 1 degree Celsius (°C) above pre-industrial levels in 2017, increasing at 0.2°C per decade. Under the current nationally determined contributions of mitigation, global warming is expected to increase 3°C by 2100 and continue afterwards.[3] Large increases in global temperatures could have substantial adverse effects on natural and human environments in California and worldwide.

[1] Intergovernmental Panel on Climate Change. 2007. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Available: https://www.ipcc.ch/site/assets/uploads/2018/05/ar4_wg1_full_report-1.pdf. Accessed: January 7, 2020.

[2] Intergovernmental Panel on Climate Change. 2018. *Global Warming of 1.5°C. Contribution of Working Group I, II, and III* (Summary for Policy Makers). Available: https://www.ipcc.ch/site/assets/uploads/sites/2/2019/05/SR15_ SPM_ version_report_LR.pdf. Accessed: January 7, 2020.

[3] Ibid.

4.7.2.2 Greenhouse Gases

The principal anthropogenic (human-made) GHGs contributing to global warming are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated compounds, including sulfur hexafluoride (SF_6), hydrofluorocarbons (HFCs), and perfluorocarbons. Water vapor, the most abundant GHG, is not included in this list because its natural concentrations and fluctuations far outweigh its anthropogenic sources.

The primary GHGs of concern associated with the project are CO_2, CH_4, and N_2O. The principal characteristics of these pollutants are discussed below.

CO_2 enters the atmosphere through fossil-fuel (oil, natural gas, coal) combustion, solid waste decomposition, plant and animal respiration, and chemical reactions (e.g., from the manufacture of cement). CO_2 is also removed from the atmosphere (or *sequestered*) when it is absorbed by plants as part of the biological carbon cycle.

CH_4 is emitted during the production and transport of coal, natural gas, and oil. CH_4 emissions also result from livestock and agricultural practices as well as the decay of organic waste in municipal solid waste landfills.

N_2O is emitted during agricultural and industrial activities as well as the combustion of fossil fuels and solid waste.

Methods have been set forth to describe emissions of GHGs in terms of a single gas to simplify reporting and analysis. The most commonly accepted method for comparing GHG emissions is the global warming potential (GWP) methodology defined in IPCC reference documents. IPCC defines the GWP of various GHG emissions on a normalized scale that recasts all GHG emissions in terms of the carbon dioxide equivalent (CO_2e), which compares the gas in question to that of the same mass of CO_2 (CO_2 has a global warming potential of 1 by definition).

Table 4.7-1 lists the global warming potential of CO_2, CH_4, and N_2O and their lifetimes in the atmosphere.

Table 4.7-1. Lifetimes and Global Warming Potentials of Key Greenhouse Gases

Greenhouse Gas	Global Warming Potential (100 years)	Lifetime (years)
Carbon dioxide (CO_2)	1	—[a]
Methane (CH_4)	25	12
Nitrous oxide (N_2O)	298	114

Source: California Air Resources Board. 2020a. *GHG Global Warming Potentials.* Available: https://ww2.arb.ca.gov/ghg-gwps. Accessed: January 7, 2020.

[a] No lifetime (years) for CO_2 was presented by the California Air Resources Board.

The California Air Resources Board (CARB) recognizes the importance of reducing emissions of short-lived climate pollutants (described in Section 4.7.3, *Regulatory Framework*) to the atmosphere to achieve the State's overall climate change goals. Short-lived climate pollutants have atmospheric lifetimes on the order of a few days to a few decades. Their relative climate-forcing impacts, when measured in terms of how they heat the atmosphere, can be tens, hundreds, or even thousands of times greater than that of CO_2.[4] Recognizing their short-term lifespan and warming impact, short-lived climate pollutants are measured in terms of CO_2e, using a 20-year time period. The use of GWPs with a time horizon of 20 years captures the importance of the short-lived climate pollutants and gives a better perspective regarding the speed at which emissions controls affect the atmosphere relative to CO_2 emissions controls. The Short-Lived Climate Pollutant Reduction Strategy, discussed in Section 4.7.3, *Regulatory Framework*, addresses CH_4, HFC gases, and anthropogenic black carbon. CH_4 has lifetime of 12 years and a 20-year GWP of 72. HFC gases have lifetimes of 1.4 to 52 years and a 20-year GWP of 437 to 6,350. Anthropogenic black carbon has a lifetime of a few days to weeks and a 20-year GWP of 3,200.[5]

4.7.2.3 Greenhouse Gas Reporting

A GHG inventory is a quantification of all GHG emissions and sinks[6] within a selected physical and/or economic boundary. GHG inventories can be performed on a large scale (e.g., for global and national entities) or on a small scale (e.g., for a building or person). Although many processes are difficult to evaluate, several agencies have developed tools to quantify emissions from certain sources. Table 4.7-2 outlines the most recent global, national, statewide, and local GHG inventories to help contextualize the magnitude of potential project-related emissions.

Table 4.7-2. Global, National, State, and Regional Greenhouse Gas Emission Inventories

Emissions Inventory	Carbon Dioxide Equivalent (CO_2e) (metric tons)
2010 IPCC Global GHG Emission Inventory	52,000,000,000
2018 Environmental Protection Agency National GHG Emissions Inventory	6,676,600,000
2017 CARB State GHG Emissions Inventory	424,100,000
2015 Bay Area Air Quality Management District GHG Emissions Inventory	85,000,000
2005 South San Francisco Inventory	548,600

Sources:

Bay Area Air Quality Management District. 2017a. *Final 2017 Clean Air Plan*. Adopted April 19. Available: https://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en. Accessed: January 6, 2020.

California Air Resources Board. 2020b. *GHG Current California Emission Inventory Data* (2017). Available: https://ww2.arb.ca.gov/ghg-inventory-data. Accessed: January 7, 2020.

Intergovernmental Panel on Climate Change. 2014. *Climate Change Synthesis Report*. Available: https://www.ipcc.ch/site/assets/uploads/2018/02/SYR_AR5_FINAL_full.pdf. Accessed: January 7, 2020.

City of South San Francisco. 2014. *City of South San Francisco Climate Action Plan.* Adopted February 13. Available: https://www.ssf.net/home/showdocument?id=1318. Accessed: January 7, 2020.

U.S. Environmental Protection Agency. 2020. *Inventory of U.S. Greenhouse Gas Emissions and Sinks* (2018). Last updated: April 13. Available: https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks. Accessed: April 20, 2020.

---

4 California Air Resources Board. 2017. *Short-Lived Climate Pollutant Reduction Strategy*. Available: https://ww2.arb.ca.gov/sites/default/files/2018-12/final_slcp_report%20Final%202017.pdf. Accessed: January 7, 2020.

5 Ibid.

6 A GHG sink is a process, activity, or mechanism that removes a GHG from the atmosphere.

4.7.2.4 Potential Climate Change Effects

Climate change is a complex process that has the potential to alter local climatic patterns and meteorology. Although modeling indicates that climate change will result in sea-level rise (both globally and regionally) as well as changes in climate and rainfall, among other effects, there remains uncertainty about characterizing precise local climate characteristics and predicting precisely how various ecological and social systems will react to changes in the existing climate at the local level. Regardless of this uncertainty, it is widely understood that substantial climate change is expected to occur in the future, although the precise extent will take further research to define. Specifically, significant impacts from global climate change in California and worldwide could include:

- Declining sea ice and mountain snowpack levels, thereby increasing sea levels and sea surface evaporation rates, with a corresponding increase in atmospheric water vapor due to the atmosphere's ability to hold more water vapor at higher temperatures.[7]
- Rising average global sea levels, primarily due to thermal expansion and the melting of glaciers, ice caps, and the Greenland and Antarctic ice sheets.[8]
- Changing weather patterns, including changes in precipitation and wind patterns, and more energetic episodes of extreme weather, including droughts, heavy precipitation, heat waves, extreme cold, and intense tropical cyclones.[9]
- Declining Sierra Mountain snowpack levels, which account for approximately half of the surface water storage in California. Snow levels could decline by 70 to as much as 90 percent over the next 100 years.[10]
- Increases in the number of days that could be conducive to ozone formation (e.g., clear days with intense sunlight) by the end of the 21st century in high ozone areas.[11] The number of days could increase by 25 to 85 percent, depending on the future temperature scenario.
- Increases in the potential for erosion of California's coastlines as well as seawater intrusion into the Sacramento Delta and associated levee systems due to the rise in sea level.[12]
- The severity of drought conditions in California could be exacerbated (e.g., durations and intensities could be amplified, ultimately increasing the risk of wildfires and consequential damage).[13]

---

7 California Natural Resources Agency. 2018. *California's Fourth Climate Change Assessment Statewide Summary Report*. Available: http://www.climateassessment.ca.gov/state/docs/20190116-StatewideSummary.pdf. Accessed: January 7, 2020.

8 Intergovernmental Panel on Climate Change. 2018. *Global Warming of 1.5°C. Contribution of Working Group I, II, and III* (Summary for Policy Makers). Available: https://www.ipcc.ch/site/assets/uploads/sites/2/2019/05/SR15_SPM_version_report_LR.pdf. Accessed: January 7, 2020.

9 Ibid.

10 California Natural Resources Agency. 2018. *California's Fourth Climate Change Assessment Statewide Summary Report*. Available: http://www.climateassessment.ca.gov/state/docs/20190116-StatewideSummary.pdf. Accessed: January 7, 2020.

11 Ibid.

12 Ibid.

13 Ibid.

- Under changing climate conditions, agricultural operations are forecast to experience lower crop yields due to extreme heat waves, heat stress, increased water needs of crops and livestock (particularly during dry and warm years), and new and changing pest and disease threats.[14]
- The impacts of climate change, such as increased numbers of heat-related events, droughts, and wildfires, pose direct and indirect risks to public health, with people experiencing worsening episodes of illness and an earlier death. Indirect impacts on public health include increases in incidents of vector-borne diseases, stress and mental trauma due to extreme events and disasters, economic disruptions, and residential displacement.[15]

4.7.3 Regulatory Framework

4.7.3.1 International

In 2015, the twenty-first session of the Conference of Parties (COP21) took place in Paris, France. The session included representatives from 196 parties to the United Nations Framework Convention on Climate Change. The Paris Agreement included limiting global temperature increases to well below 2°C, establishing binding commitments so all parties make Nationally Determined Contributions (NDCs) as well as pursuing domestic policies to achieve the NDCs, and having all countries report regularly regarding their emissions and progress made in implementing and achieving their NDCs. In April 2016, 174 states and the European Union signed the agreement, including the United States. However, on November 4, 2019, President Donald Trump formally notified the United Nations that the United States would withdraw from the Paris Agreement. The United States has begun the 1-year process of exiting the deal, which can occur no sooner than November 2020.

The Under2 Coalition is an international coalition of jurisdictions that signed the Global Climate Leadership Memorandum of Understanding (Under2 MOU) following President Trump's decision to withdraw from the Paris Agreement. Under2 MOU aims to limit global warming to 2°C, limit GHGs to below 80 to 95 percent below 1990 levels, and/or achieve a per capita annual emissions goal of less than 2 metric tons by 2050. Under2 MOU has been signed or endorsed by 135 jurisdictions, including California, representing 32 countries and six continents.

4.7.3.2 Federal

There is currently no federal overarching law related specifically to climate change or reductions in GHG emissions. Under the Obama administration, the U.S. Environmental Protection Agency (EPA) had been developing regulations under the Clean Air Act (CAA). There have also been settlement agreements between EPA, several states, and nongovernmental organizations to address GHG emissions from electric generating units and refineries. In addition, EPA issued an Endangerment Finding and a Cause or Contribute Finding. EPA has also adopted a Mandatory Reporting Rule and Clean Power Plan. Under the Clean Power Plan, EPA issued regulations to control CO_2 emissions from new and existing coal-fired power plants. However, on February 9, 2016, the Supreme Court issued a stay regarding these regulations pending litigation. In addition, former EPA Administrator Scott Pruitt signed a measure to repeal the Clean Power Plan. The fate of the proposed regulations is uncertain, given the change in federal administrations and the pending deliberations in federal courts.

[14] Ibid.

[15] Ibid.

The National Highway Traffic Safety Administration (NHTSA) sets the Corporate Average Fuel Economy (CAFÉ) standards to improve average fuel economy and reduce GHG emissions generated by cars and light-duty trucks. NHTSA and EPA have proposed amendments to the current fuel efficiency standards for passenger cars and light-duty trucks and new standards for model years 2021 through 2026. Under the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule, current 2020 standards would be maintained through 2026. California, 22 other states, the District of Columbia, and two cities filed suit against the proposed action on September 20, 2019 (*California et al. v. United States Department of Transportation et al.,* 1:19-cv-02826, U.S. District Court for the District of Columbia). The lawsuit requests a "permanent injunction prohibiting defendants from implementing or relying on the preemption regulation" but does not stay its implementation during legal deliberations. Part 1 of the SAFE Vehicles Rule went into effect on November 26, 2019. Part 2 of the rule was finalized on March 30, 2020. The rule will decrease the stringency of the CAFÉ standards 1.5 percent each year through model year 2026; the standards issued in 2012 would have required annual fuel efficiency increases of about 5 percent.

4.7.3.3 State

California has adopted statewide legislation to address various aspects of climate change and GHG emissions. Much of this legislation establishes a broad framework for the State's long-term GHG reduction and climate change adaptation program. The State's governors have also issued several executive orders (EOs) related to the State's evolving climate change policy. Of particular importance are Assembly Bill (AB) 32 and Senate Bill (SB) 32, which outline the State's GHG reduction goals (i.e., achieving 1990 emissions levels by 2020 and a level 40 percent below 1990 emissions levels by 2030). In the absence of federal regulations, control of GHGs is generally regulated at the State level. It is typically approached by setting emissions reduction targets for existing sources of GHGs, setting policies to promote renewable energy and increase energy efficiency, and developing statewide action plans. Summaries of key policies, legal cases, regulations, and legislation at the State level that are relevant to the proposed project are identified below.

Assembly Bill 1493

With the 2002 passage of AB 1493, also known as Pavley I, California launched an innovative and proactive approach to dealing with GHG emissions and climate change at the State level. AB 1493 requires CARB to develop and implement regulations to reduce GHG emissions from automobiles and light-duty trucks. These stricter emissions standards were designed to apply to automobiles and light-duty trucks beginning in the 2009 model year. Although litigation challenged these regulations and EPA initially denied California's related request for a waiver, the waiver request was granted.[16] In 2012, additional strengthening of the Pavley standards (referred to previously as Pavley II but now referred to as the Advanced Clean Cars measure) was adopted for vehicle model years 2017 through 2025. Together, the two standards are expected to increase average fuel economy numbers to roughly 54.5 miles per gallon in 2025.

[16] As noted above, however, California's waiver to set state-specific standards is currently uncertain because of the SAFE Vehicles Rule.

Executive Order S-3-05

On June 1, 2005, Governor Arnold Schwarzenegger signed EO S-3-05. The goal of this EO was to reduce California's GHG emissions to (1) 2000 levels by 2010 (achieved), (2) 1990 levels by 2020, and (3) 80 percent below the 1990 levels by 2050. EO S-3-05 also called for the California Environmental Protection Agency to prepare biennial science reports on the potential impact of continued global warming on certain sectors of the California economy. As a result of the scientific analysis presented in these biennial reports, a comprehensive Climate Adaptation Strategy was released in December 2009, following extensive interagency coordination and stakeholder input. The latest of these reports, the *Climate Action Team Biennial Report*, was published in December 2010.

Executive Order S-01-07

With EO S-01-07 in 2007, Governor Schwarzenegger set forth the low-carbon fuel standard (LCFS) for California. Under this EO, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by 2020.

Executive Order B-55-18

EO B-55-18 acknowledges the environmental, community, and public health risks posed by future climate change. It further recognizes the climate stabilization goal adopted by 194 states and the European Union under the Paris Agreement. Although the United States was not party to the agreement, California is committed to meeting the Paris Agreement goals and going beyond them wherever possible. Based on the worldwide scientific agreement that carbon neutrality must be achieved by mid-century, EO B-55-18 establishes a new state goal to achieve carbon neutrality as soon as possible, no later than 2045, and achieve and maintain net negative emissions thereafter. The EO charges the CARB with developing a framework for implementing and tracking progress toward these goals. This EO extends EO S-3-05 but is binding only on state agencies.

Assembly Bill 32

One goal of EO S-03-05 was further reinforced by AB 32 (Chapter 488, Statutes of 2006), the Global Warming Solutions Act of 2006, which required the State to reduce GHG emissions to 1990 levels by 2020. Since AB 32 was adopted, CARB, the California Energy Commission (CEC), the California Public Utilities commission (CPUC), and the Building Standards Commission have been developing regulations to help meet the goals of AB 32. Under AB 32, CARB is required to prepare a scoping plan and update it every 5 years. The scoping plan was approved in 2008, the First Update was approved in 2014, and an additional update was approved in 2017 (see discussion of SB 32, below). The scoping plan identifies specific measures for reducing GHG emissions to 1990 levels by 2020. It also requires CARB and other state agencies to develop and enforce regulations and other initiatives for reducing GHGs. Specifically, the AB 32 scoping plan articulates a key role for local governments, recommending they establish GHG reduction goals for both their municipal operations and the community consistent with those of the State. In 2018, CARB announced that inventory year 2016 emissions had dropped below 1990 levels, which would mean achievement of the AB 32 goal if emissions continue on their current trajectory.[17]

[17] California Air Resources Board. 2018. *Climate Pollutants Fall Below 1990 Levels for the First Time.* Available: https://ww2.arb.ca.gov/news/climate-pollutants-fall-below-1990-levels-first-time. Accessed: April 20, 2020.

Assembly Bill 939 (1989) and Assembly Bill 341 (2011)

To minimize the amount of solid waste that must be disposed of in landfills, the State legislature passed the California Integrated Waste Management Act of 1989 (AB 939), effective January 1990. According to AB 939, all cities and counties were required to divert 25 percent of all solid waste from landfill facilities by January 1, 1995, and 50 percent by January 1, 2000. Through other statutes and regulations, this 50 percent diversion rate also applies to state agencies. In order of priority, waste reduction efforts must promote source reduction, recycling and composting, and environmentally safe transformation and land disposal.

In 2011, AB 341 modified the California Integrated Waste Management Act and directed the California Department of Resources Recycling and Recovery (CalRecycle) to develop and adopt regulations for mandatory commercial recycling. As of July 1, 2012, the resulting Mandatory Commercial Recycling Regulation required certain businesses that generate 4 cubic yards or more of commercial solid waste per week to arrange recycling services. To comply with this requirement, businesses may either separate recyclables and self-haul them or subscribe to a recycling service that includes mixed-waste processing. AB 341 also established a statewide recycling goal of 75 percent; the 50 percent disposal reduction mandate still applies for cities and counties under AB 939.

Senate Bill 97

SB 97 required the Governor's Office of Planning and Research (OPR) to develop recommended amendments to the California Environmental Quality Act (CEQA) Guidelines for addressing GHG emissions. The amendments became effective on March 18, 2010.

Senate Bill 350—De Leon (Clean Energy and Pollution Reduction Act of 2015)

SB 350 was approved by the California legislature in September 2015 and signed by Governor Brown in October 2015. Its key provisions are to require the following by 2030: (1) a renewables portfolio standard of 50 percent and (2) a doubling of energy efficiency (electrical and natural gas) by 2030, including improvements to the efficiency of existing buildings. These mandates will be implemented by future actions of the CPUC and CEC.

Senate Bill 375

SB 375, signed into law by Governor Schwarzenegger on September 30, 2008, became effective January 1, 2009. This law requires the State's 18 metropolitan planning organizations to develop sustainable communities strategies (SCS) as part of their regional transportation plans (RTPs) through integrated land use and transportation planning and demonstrate an ability to attain the GHG emissions reduction targets that CARB established for the region by 2020 and 2035. This would be accomplished through either the financially constrained SCS as part of the RTP or an unconstrained alternative planning strategy. If regions develop integrated land use, housing, and transportation plans that meet the SB 375 targets, new projects in these regions can be relieved of certain CEQA review requirements.[18]

---

[18] This project does not quality for streamlined CEQA review because it is not a mixed-used transit priority project.

Senate Bills 1078, 107, and 2

SBs 1078 (2002), 107 (2006), and 2 (2011), California's Renewables Portfolio Standard (RPS), obligates investor-owned utilities, energy service providers, and community choice aggregators to procure additional retail sales each year from eligible renewable sources, with the long-range target of procuring 33 percent of retail sales from renewable resources by 2020. The CPUC and CEC are jointly responsible for implementing the program.

Senate Bill 32 and Assembly Bill 197

SB 32 (2016) requires CARB to ensure that statewide GHG emissions are reduced to at least 40 percent below the 1990 level by 2030, consistent with the target set forth in EO B-30-15. The companion bill to SB 32, AB 197, creates requirements to form a joint legislative committee on climate change policies, requires CARB to prioritize direct emission reductions and consider social costs when adopting regulations to reduce GHG emissions beyond the 2020 statewide limit, requires CARB to prepare reports on sources of GHGs and other pollutants, establishes 6-year terms for voting members of CARB, and adds two legislators as non-voting members of CARB. CARB adopted the 2017 Climate Change Scoping Plan in November 2017 to meet the GHG reduction requirement set forth in SB 32. The updated scoping plan includes various elements, including doubling energy efficiency savings, increasing the LCFS from 10 to 18 percent, adding 4.2 million zero-emission vehicles on the road, implementing the sustainable freight strategy, implementing a post-2020 cap-and-trade program, creating walkable communities with expanded mass transit and other alternatives to traveling by car, and developing an integrated natural and working lands action plan to protect land-based carbon sinks.

Senate Bill 605 and Senate Bill 1383

SB 605 directed CARB, in coordination with other state agencies and local air districts, to develop a comprehensive Short-Lived Climate Pollutant (SLCP) Reduction Strategy. SB 1383 directed CARB to approve and implement the SLCP reduction strategy to achieve the following reductions:

- 40 percent reduction in CH_4 from the 2013 levels by 2030
- 40 percent reduction in HFC gases from the 2013 levels by 2030
- 50 percent reduction in anthropogenic black carbon from the 2013 levels by 2030

The bill also establishes the following targets for reducing organic waste in landfills and CH_4 emissions from dairy and livestock operations:

- 50 percent reduction in organic waste disposal from the 2014 level by 2020
- 75 percent reduction in organic waste disposal from the 2014 level by 2025
- 40 percent reduction in CH_4 emissions from livestock and dairy manure management operations by 2030 compared with the livestock and dairy sectors' 2013 levels

CARB and CalRecycle are currently developing regulations to achieve the organic waste reduction goals found under SB 1383. In January 2019 and June 2019, CalRecycle proposed new and amended regulations in Titles 14 and 27 of the California Code of Regulations. Among other things, the regulations set forth minimum standards for organic waste collection, hauling, and composting. The final regulations will take effect on or after January 1, 2022.

Short-Lived Climate Pollutant Reduction Strategy

CARB adopted the SLCP Reduction Strategy in March 2017 as a framework for achieving the CH_4, HFC, and anthropogenic black carbon reduction targets set by SB 1383. The SLCP Reduction Strategy includes 10 measures that fit within a wide range of ongoing planning efforts throughout the State, including CARB's and CalRecycle's proposed rulemaking on organic waste diversion.

Senate Bill 100

The State's existing renewables portfolio standard requires all retail sellers to procure a certain amount of electricity from eligible renewable energy resources so that the total number of kilowatt-hours sold to their retail customers equals 25 percent of sales by December 31, 2016 (achieved); 33 percent by December 31, 2020; 40 percent by December 31, 2024; 45 percent by December 31, 2027; and 50 percent by December 31, 2030. SB 100 revises and extends these renewable resource targets to 50 percent by December 31, 2026; 60 percent by December 31, 2030; and 100 percent by December 31, 2045.

Senate Bill 743

SB 743 requires revisions to the State CEQA Guidelines to establish new impact analysis criteria for the assessment of a project's transportation impacts. The intent behind SB 743 and revising the State CEQA Guidelines is to integrate and balance the needs of congestion management, infill development, active transportation, and GHG emissions reduction. OPR recommends that vehicle miles traveled (VMT) serve as the primary analysis metric, replacing the existing criteria of delay and level of service. In 2018, OPR released a technical advisory, outlining potential VMT significance thresholds for different project types. For example, it would be reasonable to conclude that office projects with a VMT level that is 15 percent[19] less than existing conditions (2015–2018 average) would be consistent with statewide GHG reduction targets. With respect to retail land uses, any net increase in VMT may indicate a significant transportation impact. The new VMT methodology is required as of July 1, 2020, although it can be used earlier.

Senate Bill X7-7

SB X7-7, the Water Conservation Act of 2009, sets a goal of reducing per capita urban water use by 20 percent by December 31, 2020. The State was required to make incremental progress toward this goal by reducing per capita water use by at least 10 percent by December 31, 2015. This is an implementing measure of the water sector of the AB 32 scoping plan, which will continue to be implemented beyond 2020. Reductions in water consumption reduce the amount of energy necessary, as well as associated emissions, to convey, treat, and distribute water; it also reduces emissions from wastewater treatment.

[19] The 15 percent figure is based on analyses completed by CARB. CARB's analysis determined that per capita VMT numbers that are 14.3 percent lower than the numbers under existing conditions or per capita VMT numbers for light-duty vehicles that are approximately 16.8 percent lower than the numbers under existing conditions are consistent with statewide GHG reduction targets. California Air Resources Board. 2019. *2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals*. January. Available: https://ww2.arb.ca.gov/sites/default/files/2019-01/2017_sp_vmt_reductions_jan19.pdf. Accessed: February 20, 2020.

California Green Building Standards Code and Title 24 Updates

The California Green Building Standards Code (proposed Part 11, Title 24) was adopted as part of the California Building Standards Code (24 California Code of Regulations). Part 11 established voluntary standards that became mandatory under the 2010 edition of the code. These involved sustainable site development, energy efficiency (in excess of California Energy Code requirements), water conservation, material conservation, and internal air contaminants. The current energy efficiency standards were adopted in 2019 and took effect on January 1, 2020.

4.7.3.4 Regional

Metropolitan Transportation Commission

The Metropolitan Transportation Commission (MTC) is the metropolitan planning organization for the nine counties that make up the San Francisco Bay Area and the San Francisco Bay Area Air Basin (SFBAAB), which includes the City of South San Francisco. The first per capita GHG emissions targets for the SFBAAB were a 7 percent reduction by 2020 and a 15 percent reduction by 2035 compared with 2005 levels. In 2013, MTC adopted an SCS as part of its RTP for the SFBAAB. This was known as Plan Bay Area. The plan goes beyond the regional per capita targets, achieving 10 and 16 percent reductions in per capita GHG emissions by 2020 and 2035, respectively.[20] On July 26, 2017, the strategic update to this plan, known as Plan Bay Area 2040, was adopted by the Association of Bay Area Governments (ABAG) and the MTC. As a limited and focused update, Plan Bay Area 2040 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 2013.[21] As required by SB 375, CARB updated the per capital GHG emissions reduction targets in 2018. The new targets, which will be addressed in MTC's forthcoming RTPs, are a 10 percent per capita GHG reduction by 2020 and 19 percent per capita reduction by 2035 compared with 2005 levels.[22]

Bay Area Air Quality Management District

As discussed in Section 4.2, *Air Quality*, of this draft environmental impact report (EIR), the Bay Area Air Quality Management District (BAAQMD) is responsible for air quality planning within the SFBAAB, including projects in the City. BAAQMD has adopted advisory emission thresholds to assist CEQA lead agencies in determining the level of significance of a project's GHG emissions, including long-range plans (e.g., general plans, specific plans), which are outlined in the agency's California

[20] Metropolitan Transportation Commission and Association of Bay Area Governments. 2013. *Plan Bay Area.* Adopted: July 18. Available: http://files.mtc.ca.gov/library/pub/28536.pdf. Accessed: June 8, 2020.

[21] Metropolitan Transportation Commission and Association of Bay Area Governments. 2017. *Plan Bay Area 2040.* Adopted: July 26. Available: http://2040.planbayarea.org/cdn/ff/buje2Q801oUV3Vpib-FoJ6mkOfWC9S9sgrSgJrwFBgo/1510696833/public/2017-11/Final_Plan_Bay_Area_2040.pdf. Accessed: February 7, 2020.

[22] California Air Resources Board 2020c. *SB 375 Regional Plan Climate Targets.* Available: https://ww2.arb.ca.gov/our-work/programs/sustainable-communities-program/regional-plan-targets. Accessed: February 7, 2020.

Environmental Quality Act, Air Quality Guidelines.[23] The BAAQMD CEQA Guidelines also outline methods for quantifying GHG emissions as well as developing potential mitigation measures. As discussed in Section 4.2, *Air Quality*, BAAQMD has also adopted air quality plans to protect the climate, including the 2017 Clean Air Plan: Spare the Air, Cool the Climate.[24] The 2017 Clean Air Plan outlines feasible measures to reduce GHGs to 40 percent below 1990 levels by 2030 and 80 percent below 1990 levels by 2050.

4.7.3.5 Local

South San Francisco General Plan

The 1999 City of South San Francisco (City) General Plan provides a vision for long-range physical and economic development of the City, provides strategies and specific implementing actions, and establishes a basis for judging whether specific development proposals and public projects are consistent with the City's plans and policy standards. The City General Plan contains an Open Space and Conservation Element, which outlines policies related to habitat and biological resources, water quality, air quality, GHG emissions, and historic and cultural resources. The City General Plan includes the following policies, which are applicable to GHG emissions:

- Guiding Policy 7.3-G-4: Encourage land use and transportation strategies that promote the use of alternatives to the automobile for transportation, including bicycling, bus transit, and carpooling.
- Guiding Policy 7.3-G-5: Promote clean and alternative fuel combustion in mobile equipment and vehicles.
- Implementing Policy 7.3-I-2: Use the City's development review process and the CEQA regulations to evaluate and mitigate the local and cumulative effects of new development on air quality and GHG emissions.
- Implementing Policy 7.3-I-6: Periodically update the inventory of community-wide GHG emissions and evaluate appropriate GHG emissions reduction targets, consistent with current state objectives, statewide guidance, and regulations.
- Implementing Policy 7.3-I-7: Adopt and implement the City's Climate Action Plan (CAP), which will identify a GHG emissions reduction target and measures and actions to achieve the reduction target.
- Implementing Policy 7.3-I-8: Evaluate and regularly report to City Council, or its designee, on the implementation status of the CAP and update the CAP as necessary should the City find that adopted strategies are not achieving anticipated reductions or to otherwise incorporate new opportunities.

---

[23] Bay Area Air Quality Management District. 2017b. *California Environmental Quality Act, Air Quality Guidelines.* May. Available: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed: January 7, 2020.

[24] Bay Area Air Quality Management District. 2017a. *Final 2017 Clean Air Plan.* Adopted April 19. Available: https://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en. Accessed: January 6, 2020.

- Implementing Policy 7.3-I-9: Promote land uses that facilitate alternative transit use, including high-density housing, mixed uses, and affordable housing served by alternative transit infrastructure.
- Implementing Policy 7.3-I-10: Facilitate energy efficiency in building regulations and streamlined review processes, providing flexibility to achieve specified energy performance levels and requiring energy efficiency measures as appropriate.
- Implementing Policy 7.3-I-11: Coordinate with the business community to encourage energy efficiency in the city's largest energy users while supporting economic growth objectives.
- Implementing Policy 7.3-I-12: Adopt guidelines, standards, and flexible regulations that promote on-site renewable energy systems while strengthening South San Francisco's economic competitiveness.
- Implementing Policy 7.3-I-13: Encourage efficient, clean energy and fuel use through collaborative programs, award programs, and incentives while removing barriers to the expansion of alternative fuel facilities and infrastructure.
- Implementing Policy 7.3-I-14: Ensure that design guidelines and standards support operation of alternative-fuel facilities, vehicles, and equipment.

Climate Action Plan

The Climate Action Plan (CAP), adopted in 2014, includes goals, policies, and strategies to reduce the City's GHG emissions, in compliance with AB 32 and SB 375. GHG reduction strategies identified in the CAP include a development checklist to identify applicable plan measures for discretionary projects. The City's CAP was adopted in 2014, with the purpose of reducing GHGs community-wide to achieve a reduction target of 15 percent below 2005 emission levels by 2020. As discussed in Section 4.5, *Energy*, of this draft EIR, the City has identified GHG reduction measures to reduce GHG emissions. Strategies include implementation of transportation demand management plans, expanding active transportation alternatives, maximizing energy efficiency in the build environment, developing a waste reduction strategy to increase recycling and reuse of materials, and reducing water demand.[25] The City's CAP is currently being updated, as part of the General Plan Update. The 2014 CAP remains active until completion and adoption of the new CAP.

Gateway Specific Plan

The Gateway Specific Plan covers the portion of the East of 101 Area Plan from east of the Caltrain tracks to the eastern boundary of the parcels along the east side of Gateway Boulevard and the area between Oyster Point Boulevard and Grand Avenue on the northern and southern boundaries. The Specific Plan is "intended to provide for various commercial and research and development land uses integrated by consistent development standards." The Gateway Specific Plan includes the following construction standards standard applicable to greenhouse gas emissions:

- Construction Standard 1(d): Energy Conservation. All Buildings shall be designed, insulated and lighted in accordance with applicable federal and state energy conservation laws and regulations.

[25] City of South San Francisco. 2014. *City of South San Francisco Climate Action Plan.* Adopted: February 13. Available: https://www.ssf.net/home/showdocument?id=1318. Accessed: January 7, 2020.

Transportation Demand Management Ordinance

The City's Transportation Demand Management (TDM) Ordinance identifies several required and optional trip reduction measures for inclusion in a TDM Plan. The ordinance requires an annual employee mode share survey of the project site to ensure that desired transportation mode shares are achieved. Where the mode share target is not achieved, City officials may require program modifications intended to increase alternative mode share or impose administrative penalties. TDM measures implemented by the proposed project would support reductions in the number of trips made by automobile and associated GHG emissions.

4.7.4 Impacts and Mitigation Measures

4.7.4.1 Significance Criteria

Based on Appendix G of the CEQA Guidelines, the proposed project would have a significant GHG emissions impact if it would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment;
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing emissions of GHGs.

State CEQA Guidelines Section 15064.4 provides guidance to lead agencies for determining the significance of environmental impacts pertaining to GHG emissions. State CEQA Guidelines Section 15064.4(a) states that a lead agency should make a good-faith effort that is based, to the extent possible, on scientific and factual data to describe, calculate, or estimate the amount of GHG emissions that would result from implementation of a project. State CEQA Guidelines Section 15064.4(b) also states that, when assessing the significance of impacts from GHG emissions, a lead agency should consider (1) the extent to which the project may increase or reduce GHG emissions compared with existing conditions, (2) whether the project's GHG emissions would exceed a threshold of significance that the lead agency has determined to be applicable 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 GHG emissions.

The California Supreme Court's decision in *Center for Biological Diversity et al. v. California Department of Fish and Wildlife* (62 Cal.4th 204) confirmed that there are multiple potential pathways for evaluating GHG emissions consistent with CEQA. Several air quality management agencies throughout the State have also drafted or adopted various threshold approaches and guidelines for analyzing GHG emissions in CEQA documents. Common threshold approaches include (1) compliance with a qualified GHG reduction strategy, (2) numeric "bright-line" thresholds, (3) efficiency-based thresholds, (4) performance-based reductions,[26] and (5) compliance with regulatory programs.

[26] Performance-based thresholds are based on the percentage reduction from a projected future condition (e.g., reducing future business-as-usual emissions to meet the SB 32 target [40 percent below 1990 levels] through a combination of state measures; project design features, such as features related to renewable energy; and mitigation.

BAAQMD's CEQA Guidelines do not identify a GHG emission threshold for construction-related emissions. Instead, BAAQMD recommends that GHG emissions from construction be quantified and disclosed and that a determination regarding the significance of the GHG emissions be made with respect to whether a project is consistent with the emissions reduction goals. The BAAQMD further recommends incorporation of best management practices (BMPs) to reduce GHG emissions during construction, as feasible and applicable. This approach is used to evaluate construction-generated emissions.

The City has not adopted a qualified GHG reduction plan beyond 2020 (when the proposed project would be constructed and operational), and tiering per State CEQA Guidelines Section 15183.5 is not an applicable option to assess the proposed project's GHG impacts.

BAAQMD has adopted a numeric threshold of 10,000 metric tons of CO_2e for stationary-source projects. This threshold is consistent with stationary-source thresholds adopted by other air quality management districts throughout the State. The threshold level is intended to capture 95 percent of all GHG emissions associated with new permit applications for stationary-sources in the air basin. It would do so by capturing only the large, significant projects, because permit applications with emissions above the threshold of 10,000 metric tons of CO_2e account for less than 10 percent of all applications. The emergency generator included as part of the proposed project would be a permitted source, and as such, the BAAQMD's threshold of 10,000 metric tons of CO_2e is appropriate for analyzing the significance of emissions generated by the generator. Impacts from stationary-source emissions would be considered less than significant if the emissions total less than 10,0000 metric tons of CO_2e.

In addition, BAAQMD has adopted a bright-line and efficiency-based threshold for land use projects (1,100 metric tons of CO_2e per year and 4.6 metric tons of CO_2e/service population per year,[27] respectively)[28] to evaluate a project's total GHG emissions. However, these thresholds were developed by BAAQMD in accordance with the reduction goals of the AB 32 2020 GHG reduction targets. The proposed project would begin to be operational in 2021 and would operate entirely in the post-2020 period. Thus, it is not appropriate to evaluate the project's emissions relative to 2020 thresholds.[29] Therefore, in absence of an applicable threshold, this analysis references the proposed project's GHG emissions relative to BAAQMD's thresholds adjusted for 2021 (1,056 annual metric tons of CO_2e/year) for information purposes and to contextualize the proposed project's GHG emissions. Ultimately, the analysis examines the proposed project's consistency with applicable best management practices and design features required by regulations (e.g., Title 24, CalGreen, etc.), and guidance from state agencies (e.g., CARB, OPR, etc.) that pertains to achieving GHG reduction targets. Such an approach is recognized by the Supreme Court as an acceptable pathway for evaluating project-level GHG emissions under CEQA (62 Cal.4th 204). The proposed project is assumed to be operational by 2021. The State's 2030 target has been codified

---

[27] Service population refers to the total number of residents and/or employees. For the proposed project, the service population for the entire project site (701 Gateway and 751 Gateway) is 1,181 employees.

[28] Bay Area Air Quality Management District. 2017b. *California Environmental Quality Act, Air Quality Guidelines.* May. Available: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed: January 7, 2020.

[29] These thresholds do not account for GHG emissions reductions from new development post-2020 and are not tailored to the proposed project.

in law through SB 32 and the 2017 climate change scoping plan[30] that was adopted to meet this 2030 target. Therefore, 2030 marks the next statutory statewide milestone target that would be applicable to the proposed project.

The analysis focuses on the 2030 target and the plans, policies, and regulations adopted pursuant to achieving 2030 reductions. Emissions generated in 2021 are used as an indicator for long-term emissions reduction progress and are evaluated as they relate to the proposed project's impacts on the State's long-term GHG emission reduction targets. More specifically, best management practices and project design features stipulated by Title 24, California Department of Water Resources Model Water Efficient Landscape Ordinance, the 2019 California Green Building Standards Code, and CARB's 2017 scoping plan, for instance, could be utilized to show compliance with performance-based standards needed to fulfill the statewide goal for reducing GHG emissions.

The proposed project's compliance with best management practices, design features, and regulatory plans and programs adopted by CARB and other State agencies is therefore used to discuss the significance of the proposed project's GHG emissions. While the regulatory framework to achieve long-term (post-2030) emissions reductions is in its infancy, many of the best management practices, design features, and programs discussed in the sections below are likely to be carried forward or have already been adopted with post-2030 requirements (e.g., Renewable Portfolios Standard, Title 24, etc.). Accordingly, evaluating consistency with best management practices, design features, and programs and relevant guidance published by agencies such as CARB and OPR for the reduction of long-term emissions is therefore considered in the analysis of the proposed projects emissions.

- **Mobile sources:** CARB's 2017 scoping plan recognizes that, although vehicle technologies and low-carbon fuels will continue to reduce transportation sector emissions, VMT reductions are necessary to achieve California's long-term GHG emissions reduction target. Recent CARB analysis demonstrates that a 16.8 percent reduction in light-duty VMT per service population by 2050 (compared to a 2015–2018 average) would be needed statewide to meet long-term climate change planning goals through 2050.[31] This reduction target is consistent with recent OPR guidance[32] issued in SB 743, as discussed in Section 4.7.3, *Regulatory Framework*, and Section 4.9, *Transportation and Circulation*. Construction of the proposed project would commence in 2020 and be operational in 2021, if related entitlements are approved by the City. Accordingly, use of CARB's threshold of a 16.8 percent reduction in light-duty VMT per service population for mobile-source emissions is applicable to the proposed project. Mobile-source emissions would be considered less than significant if the proposed project achieves a per service population VMT reduction of at least 16.8 percent (compared to a 2015–2018 average). In addition to VMT reductions, compliance with regulatory programs (e.g., AB 1493, LCFS, SB 743, and SB 375) would also be required to reduce statewide mobile GHG emissions to a less-than-significant impact.

30 California Air Resources Board. 2019. *2017 Scoping Plan – Identified VMT Reductions and Relationship to State Climate Goals.* January. Available: https://ww2.arb.ca.gov/sites/default/files/2019-01/2017_sp_vmt_reductions_jan19.pdf. Accessed: February 20, 2020.

31 Ibid.

32 Governor's Office of Planning and Research. 2018. *Technical Advisory on Evaluating Transportation Impacts in CEQA.* December. Available: http://opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf. Accessed: February 20, 2020.

- **Energy, water, waste, area, and land sources.** CARB's 2017 scoping plan, which relies heavily on state programs (e.g., Title 24 and SB 100), outlines the strategies required to reduce statewide GHG emissions and achieve California's SB 32 reduction target.[33] Projects that implement applicable strategies from the 2017 scoping plan and other best management practices and design features outlined in other programs would be consistent with the State's GHG reduction framework and requirements for these sectors. Accordingly, a sector-by-sector review of the respective project features and sustainability measures included in the proposed project is provided to evaluate consistency with best management practices, design features, plans, and policies. This assessment also considers recent OPR guidance[34] related to long-term reductions in statewide emissions. Accordingly, impacts from energy, water, waste, area, and land use source emissions would be considered less than significant if the proposed project is consistent with all applicable best management practices, design features, strategies and supporting regulations and guidance.

4.7.4.2 Approach to Analysis

Construction Emissions

The proposed project would generate construction-related GHG emissions from the exhaust of mobile and stationary construction equipment, exhaust of employees' vehicles and haul trucks, electricity consumption, and tree removal. GHG emissions were estimated using the California Emissions Estimator Model (CalEEMod), version 2016.3.2. The construction schedule, details regarding equipment operations, trip numbers and lengths, and material quantities were provided by the project sponsor. Annual construction emissions were estimated using these project-specific details. The construction modeling inputs and CalEEMod outputs are provided in Appendix B of this draft EIR.

Operational Mobile-Source Emissions

GHG impacts from motor vehicles traveling to and from the project site were evaluated using CARB's EMFAC2017 emissions model (version 1.02) and traffic data provided by Fehr & Peers.[35] The existing office building at 701 Gateway Boulevard would remain on the site. Therefore, operational mobile-source emissions associated with the office building at 701 Gateway Boulevard were estimated and presented under existing (2019) and future conditions (2021).[36]

---

33 California Air Resources Board. 2017. *California's 2017 Climate Change Scoping Plan.* November. Accessed: https://ww3.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf. Accessed: February 20, 2020.

34 California Air Resources Board. 2019. *2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals.* January. Available: https://ww2.arb.ca.gov/sites/default/files/2019-01/2017_sp_vmt_reductions_jan19.pdf. Accessed: February 20, 2020.

35 Hawkins, Mike. Fehr & Peers. March 13, 2020—email to Jessica Viramontes: 751 Gateway Updated Transportation Materials.

36 There are no emission sources associated with the existing surface parking lot; therefore, there are no emissions associated with the lot under the existing condition. Emissions presented for the existing condition represent those from the office building at 701 Gateway Boulevard.

To determine GHG emissions (i.e., from vehicle movement/travel), the number of daily employees on the project site and a VMT per capita conversion factor, both provided by Fehr & Peers, were used estimate total VMT with and without the proposed project. GHG emissions from vehicle exhaust were calculated by multiplying the VMT estimates by the appropriate emission factors from EMFAC2017 with SAFE Vehicle Rule adjustments per CARB.

Daily trips for the proposed project were also provided by Fehr & Peers and used to estimate a per employee trip generation rate, which was used to estimate existing daily trips associated with the existing building at 701 Gateway Boulevard. The number of daily employee trips associated with the proposed project assumes a mode share consistent with the City/County Association of Governments of San Mateo County (C/CAG) travel demand model and recent analysis for other similar projects within the City and the region. The number of daily trips was calculated to quantify vehicle-process emissions, such as emissions generated from vehicle starts, running losses, etc. Process GHG emissions were then calculated by multiplying the number of daily trips by the appropriate process-specific GHG emission factors from EMFAC2017. The running exhaust emissions and process emissions were combined to quantify total operational GHG emissions from the project's use of vehicles. The EMFAC0217 emission factors and traffic data used in this analysis are provided in Appendix B of this draft EIR.

Operational Area, Energy, Stationary, Water, and Waste Emissions

Area, energy, stationary, water, and waste emissions were estimated using CalEEMod (version 2016.3.2). Landscaping equipment, including gasoline-powered equipment (e.g., trimmers, mowers), is the primary area source of GHG emissions. Calculations of area-source emissions rely on CalEEMod's default assumptions, which represent a conservative estimate of equipment usage, based on the square footage of the new building space. The combustion of natural gas for building heating and hot water, as well as the use and generation of electricity, is the primary energy source of GHG emissions. Stationary sources include one emergency generator. Water consumption results in indirect GHG emissions from the conveyance and treatment of water. Waste generation results in fugitive CH_4 and N_2O emissions from the decomposition of organic matter.

Emissions were quantified for existing (2019) and 2021 conditions with the proposed project. Similar to mobile-source emissions (discussed above), area-, energy-, and stationary-source emissions were also estimated for the existing office building at 701 Gateway Boulevard. Annual energy (e.g., electricity and natural gas) consumption and annual water consumption for the existing office building at 701 Gateway Boulevard and the proposed project were provided by the project sponsor and used to model energy and water emissions.[37] The project sponsor also provided details on the proposed generator to be located on the project site. The 2021 modeling reflects implementation of state measures to reduce GHG emissions (e.g., SB 100, Pavley). Quantifiable features, consistent with the proposed project, including the installation of low-flow fixtures, were incorporated into the CalEEMod model. The net change in the number of trees on the project site was also modeled to account for changes to sequestration. The CalEEMod output files are provided in Appendix B of this draft EIR.

[37] Muchow, Chase. RMW Architecture & Interiors. March 2, 2020—email to Jessica Viramontes: 751 Gateway – Priority 1 and 2 Follow-Up.

4.7.4.3 Impact Evaluation

Impact GHG-1a: The proposed project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment during construction. (*Less than Significant with Mitigation*)

Construction associated with the proposed project would result in the temporary generation of GHG emissions. Emissions would originate from the exhaust of mobile and stationary construction equipment as well as employees' vehicles and haul trucks. Construction activities for the proposed project would include demolition of a surface parking lot, construction of a new building, various site improvements, and the provision of utility infrastructure. These activities would require mobile and stationary construction equipment as well as on-road vehicles, such as haul trucks for demolition debris and vendor trucks for deliveries. Site grading and excavation would also be required for the building foundation, utilities, and landscaping. Estimated construction GHG emissions are presented in Table 4.7-3. The table shows that project construction would generate approximately 1,335 metric tons of CO_2e over the 18-month construction period.

Table 4.7-3. Estimated Construction GHG Emissions from the Proposed Project (metric tons)

Construction Year	CO_2	CH_4	N_2O	CO_2e[a]
2020	843	< 1	< 1	845
2021	488	< 1	< 1	490
Total[b]	1,331	0	0	1,335

Source: See Appendix B of this draft EIR for CalEEMod model outputs and construction energy calculations.
Notes:
[a] Emissions represent the sum of emissions from the CalEEMod construction output and energy consumption (approximately 52,000 kilowatt-hours per year) during construction.
[b] Totals may not add up because of rounding.

For a typical building, emissions from concrete production are generated to create the materials that would be required to construct new buildings. As a project design feature, the proposed project would utilize no-carbon emission concrete. These emissions associated with concrete production are lifecycle emissions[38], however, are not required to be analyzed under CEQA. The project's use of no-carbon emission concrete would result in lower total emissions for the project and is consistent with state goals to reduce GHG emissions, but because life-cycle emissions are outside of the scope of CEQA, the emissions benefits were not quantified.

As described above, BAAQMD has not established a quantitative threshold for assessing construction-related GHG emissions. Rather, the air district recommends evaluating whether construction activities would conflict with statewide emissions reduction goals and recommends implementing feasible BMPs. If a project does not implement feasible BMPs, it is anticipated that it would conflict statewide emission goals, and construction-related GHG emission impacts would be ***significant***. Therefore, Mitigation Measure GHG-1, Require Implementation of BAAQMD-

[38] Lifecycle emissions are those that are generated during the manufacturing process, for example, to turn raw resources into buildings materials.

recommended Construction BMPs, would be implemented to avoid any conflict with statewide emissions reduction goals. Consequently, the impact from construction-related GHG emissions would be ***less than significant with mitigation***.

Mitigation Measure GHG-1: Require Implementation of BAAQMD-recommended Construction BMPs

The project sponsor shall require its contractors, as a condition in contracts (e.g., standard specifications), to reduce construction-related GHG emissions by implementing BAAQMD's recommended BMPs as set forth in BAAQMD's 2017 CEQA Guidelines, including (but not limited to) the following measures:[39]

- Ensure alternative-fuel (e.g. biodiesel, electric) construction vehicles/equipment make up at least 15 percent of the fleet;
- Use local building materials (at least 10 percent) sourced from within 100 miles of the planning area; and
- Recycle and reuse at least 50 percent of construction waste or demolition materials.

The project sponsor shall submit evidence of compliance to the City prior to the start of construction.

Impact GHG-1b: The proposed project would generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment during operation. (*Significant and Unavoidable with Mitigation)*

Operation of the proposed project would generate direct and indirect GHG emissions. Sources of direct emissions include vehicle trips, emergency generators, natural gas combustion, and landscaping activities. Indirect emissions would be associated with electricity consumption, waste and wastewater generation, and water use. Operational GHG emissions were evaluated under existing-year (2019) and proposed project conditions (2021). The analysis includes emissions benefits from statewide GHG emissions reduction programs (e.g., SB 100) as well as quantifiable sustainability measures, including the installation of low-flow fixtures, incorporated into the project design. Table 4.7-4 presents the proposed project's net annual GHG emissions, which is the difference between proposed project conditions (2021) and existing emissions (2019), and total GHG emissions.

As shown in Table 4.7-4, the proposed project would result in a net annual increase of 4,338 metric tons of CO_2e, exceeding the adjusted threshold of 1,056 annual metric tons of CO_2e discussed above. Though comparisons with BAAQMD's adjusted threshold are discussed here for informational purposes, an analysis of the proposed project's consistency with best management practices and design features outlined in regulatory plans and programs aimed at meeting the state's long term GHG reduction targets was completed to determine whether the proposed project would generate significant levels of GHG emissions. The following sections present this analysis.

[39] Bay Area Air Quality Management District. 2017b. *California Environmental Quality Act, Air Quality Guidelines.* May. Available: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed: January 7, 2020.

Area Emissions

As shown in Table 4.7-4, annual emissions from the proposed project associated with area sources would amount to less than 1 metric ton of CO_2e. The proposed landscaping would include trees, shrubs, and biotreatment plantings as opposed to grass areas, which would minimize the routine use of mowers and other landscaping equipment.

There are no relevant measures in the scoping plan for landscaping equipment. Although a transition away from fossil-fueled equipment would be needed to achieve carbon neutrality by 2045, the scoping plan did not assume all-electric landscaping equipment in the 2030 reduction analysis. The proposed landscaping would reduce landscaping emissions compared with emissions from buildings with grass areas. This is consistent with the scoping plan's overall goal of reducing emissions from fossil-fueled landscaping equipment.

Energy Emissions

As shown in Table 4.7-4, annual building energy emissions from the proposed project would amount to approximately 655 metric tons of CO_2e. OPR's 2018 CEQA and Climate Change Advisory notes that a land use development project that "achieves applicable building energy efficiency standards, uses no natural gas or other fossil fuels, and includes Energy Star appliances, where available, may be able to demonstrate a less-than-significant greenhouse gas impact associated with project operation." Although OPR recommends that new buildings should avoid use of fossil fuels, the scoping plan does not assume all-electric buildings in the 2030 reduction analysis. Rather, the scoping plan assumes new gas appliances will be high-efficiency units.

The proposed project would consume both electricity and natural gas. Electricity-related emissions would be mitigated through compliance with the scoping plan through SB 100. Per SB 100, electricity generation will become progressively less carbon intensive until 100 percent reliance on renewable energy is achieved in 2045. In addition, the proposed project would install Energy Star appliances and meet the United States Green Building Council's Leadership in Energy and Environmental Design (LEED) requirements for Gold certification as well as the International WELL and Fitwel Building Institute Standards. Although the proposed project would allow natural gas appliances and heaters, all units would meet high-efficiency standards, consistent with the assumptions and emissions reduction requirements of the scoping plan for 2030. The proposed project would also install and include solar-ready rooftop connectivity for future installation of photovoltaic panels. This is consistent with the scoping plan's overall goal of reducing energy emissions from buildings that consume fossil fuels.

Land Use Emissions

The proposed project would retain 52 trees, remove 175 trees and plant 112 trees, for a net tree loss of 63 trees. Younger trees typically sequester more CO_2e compared to older and more mature trees.[40] However, additional sequestration from newer trees would be offset by the potential net

[40] Mongabay. 2019. *Tall and Old or Dense and Young: Which Kind of Forest Is Better for the Climate?* May. Available: https://news.mongabay.com/2019/05/tall-and-old-or-dense-and-young-which-kind-of-forest-is-better-for-the-climate/#:~:text=While%20young%20forests%20tend%20to,rate%20accelerates%20as%20it%20ages.&text=A%20study%20found%20the%20logging,the%20world's%20dirtiest%20coal%20plant. Accessed: July 21, 2020.

Table 4.7-4. Estimated GHG Emissions from Operation of the Proposed Project (metric tons/year)

Condition/Source	CO_2	CH_4	N_20	CO_2e	% CO_2e
Existing (2019)					
701 Gateway (existing office building) and 751 Gateway (existing parking lot)					
Area Sources	<1	<1	<1	<1	0%
Energy Sources	398	<1	<1	401	14%
Mobile Sources	2,331	<1	<1	2,360	82%
Stationary Sources	39	<1	<1	39	1%
Waste Generation	32	2	<1	80	3%
Water Consumption	2	<1	<1	4	<1%
Total[a]	2,802	2	0	2,884	100%
Proposed Project (2021)					
701 Gateway (existing office building)					
Area Sources	< 1	< 1	< 1	< 1	< 1%
Energy Sources	382	< 1	< 1	385	5%
Mobile Sources	2,229	< 1	< 1	2,256	31%
Stationary Sources	39	< 1	< 1	39	1%
Waste Generation	32	2	< 1	80	1%
Water Consumption	2	< 1	< 1	4	< 1%
751 Gateway (proposed R&D and office building)					
Area Sources	< 1	< 1	< 1	<1	< 1%
Energy Sources	649	< 1	< 1	655	9%
Mobile Sources	3,619	< 1	< 1	3,662	51%
Stationary Sources	39	< 1	< 1	39	1%
Waste Generation	19	1	< 1	48	1%
Water Consumption	3	< 1	< 1	7	< 1%
Total[a,b]	7,006	3	< 1	7,168	100%
Net Increase with Proposed Project					
2021 v. Existing[a, b, c]				4,292	
Land Use Emissions/Sequestration Loss (Proposed Tree Removal)[c]				46	
Total [b]				4,338	

Source: See Appendix B of this draft EIR.

Notes:

CO_2 = carbon dioxide; CH_4 = methane; N_20 = nitrous oxide; CO_2e = carbon dioxide equivalent

[a] The number of existing parking spots within the project site was revised from 558 to 564 subsequent to the GHG analysis. Parking lots generate limited GHG emissions; therefore, the six additional parking spots would not substantially change the numeric values presented in this table.

[b] Totals may not add up because of rounding.

[C] The proposed project would result in a net loss of 63 trees at the project site, resulting in losses in carbon sequestration and a net carbon increase in the atmosphere. The CalEEMod model assumes loss of new trees, which sequester more CO_2 than older trees. As such, land use emissions presented are conservative. Implementation of Mitigation Measure GHG-2 would result in a net loss of 19 of trees, which would reduce land use emissions and sequestration loss. As such "Total" emissions presented are conservative.

release of carbon from the removal of the replaced trees.[41] Therefore, it is conservatively assumed that the loss in trees would result in the loss of some carbon sequestration (up to 46 metric tons of CO_2e)[42].There are no relevant measures in the scoping plan or explicit regulatory requirements related to tree planting. Although the magnitude of emissions generated by the net loss in trees within the project site would be relatively minor, it would not be consistent with the scoping plan's overall goal of avoiding losses in carbon sequestration.

Mobile-Source Emissions

As shown in Table 4.7-4, annual mobile-source emissions from the proposed project would amount to approximately 3,662 metric ton of CO_2e. This figure is driven primarily by the additional VMT expected as a result of the proposed project. The proposed project would install 25 electric vehicle (EV) charging spots per CalGreen. As discussed in Section 4.9, *Transportation and Circulation*, of this draft EIR, the proposed project would increase VMT per service population relative to existing conditions (2019) and would not meet the 16.8 percent VMT per service population reduction target recommended by CARB to be achieved by 2030; therefore, the proposed project would conflict with the State's long-term emissions reduction trajectory.

Stationary-Source Emissions

As shown in Table 4.7-4, stationary sources (i.e., the proposed emergency generator) would generate approximately 39 metric tons of CO_2e annually. This net increase is below BAAQMD's stationary-source threshold of 10,000 metric tons of CO_2e per year.

Waste Emissions

As shown in Table 4.7-4, annual waste emissions from the proposed project would amount to approximately 48 metric tons of CO_2e. The proposed project would install communal receptacles for trash/recyclables/compostables and provide tenants with bins for separating waste. In addition, the proposed project would have dedicated areas where recyclable materials from the building would be collected and stored. These areas would be accessible for both waste haulers and tenants. Recyclable materials include mixed paper products, corrugated cardboard, glass, plastics, and metals. The proposed project would also facilitate the collection, storage, and disposal of batteries, mercury-containing lamps, and electronic waste. These features are consistent with the scoping plan's overall goal of reducing waste emissions and its specific strategy to avoid landfill CH_4 emissions by reducing the disposal of landfilled waste and organics. These features would support and comply with the mandatory recycling requirement in AB 341 and support the State's recycling goal.

Water Emissions

As shown in Table 4.7-4, annual emissions from the proposed project's water use would amount to approximately 7 metric tons of CO_2e. The proposed project includes several water conservation features. For example, the proposed project would achieve LEED Gold certification or equivalent and

[41] Trinity Consultants. 2017. *Appendix A, Calculation Details for CalEEMod.* October. http://www.aqmd.gov/docs/default-source/caleemod/02_appendix-a2016-3-2.pdf?sfvrsn=6. Accessed: July 29, 2020.

[42] The CalEEMod model assumes loss of new trees, which sequester more CO_2 than older trees. As such, estimated land use emissions are conservative.

install low-flow fixtures. Outdoor water conservation measures would include the installation and maintenance of water-efficient landscaping with low-usage plant material to minimize irrigation requirements. Furthermore, the proposed project would comply with all applicable water conservation (indoor and outdoor) measures, including Title 24, Part 6, California Energy Code baseline standard requirements for energy efficiency, based on the 2019 Energy Efficiency Standards, California Department of Water Resources Model Water Efficient Landscape Ordinance, and the 2019 California Green Building Standards Code, commonly referred to as CALGreen. These features are consistent with the scoping plan's overall goal of reducing water emissions and serve to support ongoing regulatory programs (e.g., SB X7-7 Title 24) that aim to reduce GHG emissions associated with conveying and distributing water to ultimately achieve climate neutrality.

Conclusion

The proposed project's sustainability measures represent a robust suite of strategies that are consistent with applicable policies, design features, and best management practices from the scoping plan and regulatory programs for the area, energy, waste, and water sectors. Stationary-source emissions would be below BAAQMD's stationary source threshold.

The proposed project would result in a net loss in the number of trees on the project site, which would result in losses in carbon sequestration and a relatively minor carbon increase in the atmosphere. Implementation of Mitigation GHG-2, Operational GHG Reduction Measures, would plant 44 additional trees on the project site's existing parking lots. However, there would still a net tree loss of 19 trees. In addition, the proposed project would not achieve the 16.8 percent VMT per service population reduction target. The proposed project would be subject to regulatory programs related to fuel and vehicle efficiency as well as vehicle electrification. Implementation of Mitigation Measure GHG-2, Operational GHG Reduction Measures would lead to installation of 28 more EV chargers than required by the 2019 Building Code. This measure would incentivize the use of electric vehicles, but the associated emission reductions would depend on individual choices to purchase electric vehicles and therefore were not quantified. Implementation of Mitigation Measure TR-1, as discussed in Section 4.9, *Transportation and Circulation,* of this draft EIR, would contribute a fair share toward funding the design and construction of off-site improvements to support the proposed project's first- and last-mile transit connection strategies, which are necessary to support reductions in the number of trips made by automobile. These improvements include fair-share contributions toward the City's cost of upgrading sidewalks, upgrading and extending bicycle and pedestrian pathways, providing a more direct connection to on-street shuttle stops, participating in first/last shuttle programs, and striping unmarked crosswalks. However, the lead agency cannot determine with certainty that implementation of Mitigation Measures GHG-2 and TR-1 would reduce the proposed project's VMT to a less-than-significant level because the mitigation measure's effectiveness cannot be precisely quantified. Given that the proposed project already includes a robust TDM plan, financial support for last mile improvements, and other GHG reduction features, such as installation of EV chargers, there are no other feasible mitigation measures.

Consequently, although emissions from the stationary-source, area, energy, waste, and water sectors would generally be consistent with BAAQMD's stationary threshold or the scoping plan, applicable guidance from relevant agencies, and regulatory programs, policies, design features, and best management practices, land use emissions from the proposed project would not be consistent with the scoping plan with implementation of mitigation. Mobile-source emissions, with implementation of mitigation, would also not reduce GHG emissions to ensure consistency with the State's goals. Therefore, operational GHG impacts would be ***significant and unavoidable with mitigation***.

Mitigation Measure GHG-2: Operational GHG Reduction Measures

The project sponsor shall:

- Plant 44 additional trees on existing surface parking lots; and
- Install 28 more electric vehicle (EV) charging spots than required by the 2019 Building Code.

Impact GHG-2: The proposed project would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. *(Significant and Unavoidable with Mitigation)*

SB 32 and CARB's 2017 Scoping Plan

SB 32 outlines the State's GHG emissions reduction targets for 2030 and builds on the reduction targets adopted by AB 32. The proposed project includes many GHG reduction features and would not impede the State from reaching these goals. In 2008 and 2014, CARB adopted the scoping plan and first update, respectively, as a framework for achieving AB 32. The scoping plan and first update outlined a series of technologically feasible and cost-effective measures to reduce statewide GHG emissions. CARB adopted the climate change scoping plan in November 2017 as a framework for achieving the 2030 GHG reduction goal described in SB 32. There is no state plan for addressing GHG reductions beyond 2030. Because this analysis is focused on emissions in 2030, it addresses the project's operational emissions (construction would be completed by 2021).

Based on CARB's 2017 scoping plan, many of the reductions needed to meet the 2030 target will come from state regulations, including cap-and-trade requirements, the requirement for additional renewable energy sources in California's energy supply, updates to Title 24, and increased emissions reduction requirements for mobile sources. The 2017 scoping plan indicates that reductions will need to come in the form of changes pertaining to vehicle emissions and mileage standards, changes related to sources of electricity, and increased energy efficiency at existing facilities as well as state and local plans, policies, or regulations to lower GHG emissions relative to business-as-usual conditions. The 2017 scoping plan carries forward GHG reduction measures from the first update as well as new potential measures to help achieve the State's 2030 target across all sectors of the California economy, including transportation, energy, and industry.

The 2017 scoping plan recommends prioritizing on-site GHG reduction features in the project's region. Appendix B to the 2017 scoping plan includes examples of on-site project design features and mitigation measures that may be feasible to minimize GHG emissions from land use development projects. The proposed project is generally consistent with the on-site project design features and mitigation measures outlined in Appendix B to 2017 scoping plan, reducing GHG emissions and associated impacts from area, energy, water, and waste source. For instance, the proposed project would reduce area emissions by minimizing the use of fossil fueled landscaping equipment; reduce energy emissions by installing Energy Star and high efficiency appliances, and meeting LEED Gold or equivalent certification requirements, the international WELL and Fitwel Building Institute Standards; reduce waste emissions by reducing the disposal of landfilled waste and organics and mandating recycling; reduce water emissions by achieving LEED Gold certification or equivalent, installing low-flow fixtures, installing water-efficient landscaping with low-usage plant material, and supporting ongoing water regulatory programs. These reductions would help the State meet its GHG reduction goals. As discussed above, stationary-source emissions would be below BAAQMD's stationary-source threshold.

Implementation of Mitigation GHG-2 would reduce the proposed project's net tree loss by planting additional trees on the project site's existing parking lots, but would still result in losses in overall carbon sequestration. Implementation of an aggressive TDM program, Mitigation Measure GHG-2 (i.e., EV charging stations) and Mitigation Measure TR-1 would reduce mobile-source emissions during operation but would not reduce emissions enough to meet the 16.8 percent VMT per service population reduction target developed by CARB. As discussed in the transportation chapter of this EIR and above, there are no additional, feasible VMT reduction measures. Therefore, the GHG impacts of the proposed project would be ***significant and unavoidable with mitigation*** because the project would not be consistent with every scoping plan policy even though it would help the state reduce GHG emissions because it incorporates GHG reduction measures beyond those required by law.

SB 375 and Plan Bay Area

Climate protection and transportation system effectiveness are two of seven goals addressed in MTC's Plan Bay Area (2013 and 2040). Plan Bay Area provides a long-range framework for minimizing transportation impacts on the environment, improving regional air quality, protecting natural resources, and reducing GHG emissions. The plan supports smart growth principles, promotes infill development, and proactively links land use, air quality, and transportation needs in the region. Plan Bay Area is consistent with SB 375, which requires MTC to adopt an SCS that outlines policies to reduce per service population GHG emissions from automobiles and light trucks. The SCS policies include a mix of strategies that encourage compact growth patterns, alternative transportation, transit, mobility and access, network expansion, and transportation investment.

Implementation of the SCS is intended to improve the efficiency of the transportation system and promote a variety of land use types throughout the Bay Area that meet market demands in a balanced and sustainable manner. As discussed under Impact GHG-1b, the proposed project would be built around the concept of sustainability and would include green building techniques as well as energy efficiency, water conservation, and waste reduction measures.

The proposed project would allow development that would accommodate forecast growth within the project site. Consistent with MTC goals, the proposed project would promote a transit-/pedestrian-/bicycle-friendly environment. Specifically, the proposed project would improve connectivity with employee shuttles through construction of a new shuttle stop on the project site, bicycle parking, and charging spaces for electric vehicles. These features would support alternative transportation within the project site, which could help reduce per service population GHG emissions from passenger vehicles, consistent with Plan Bay Area. However, as discussed under Impact GHG-1b, the proposed project would not meet the VMT per service population reduction target developed by CARB. Implementation of Mitigation Measure TR-1 would reduce mobile-source emissions during operation but would not reduce emissions enough to meet the reduction target. As such, it is conservatively assumed that the proposed project would not meet the 2035 per capita GHG per SB 375[43]. This may affect the ability for the region to meet its SB 375 reduction target. Therefore, the proposed project is conservatively assumed to be inconsistent with the goals of SB 375 and Plan Bay Area, and this impact would be ***significant and unavoidable with mitigation***.

[43] California Air Resources Board. 2020c. *SB 375 Regional Plan Climate Targets.* Available: https://ww2.arb.ca.gov/our-work/programs/sustainable-communities-program/regional-plan-targets. Accessed: February 7, 2020.

Consistency with Other State Regulations

Systemic changes will be required at the State level to achieve California's future GHG reduction goals. Regulations, such as future amendments to the LCFS, future updates to the State's Title 24 standards, and implementation of the State's SLCP Reduction Strategy, including forthcoming regulations for composting and organics diversion, will be necessary to attain the magnitude of reductions required for the State's goals. The proposed project would be required to comply with these regulations in new construction (in the case of updated Title 24 standards) or directly affected by the outcomes (i.e., vehicle trips and energy consumption would be less carbon intensive because of statewide compliance with future LCFS amendments and increasingly stringent RPS). Therefore, for the foreseeable future, the proposed project would not conflict with any other state-level regulations pertaining to GHGs in the post-2020 era, and this impact would be ***less than significant***.

4.7.4.4 Cumulative Impacts

Climate change is a global problem, and GHGs are global pollutants, unlike criteria air pollutants (such as ozone precursors), which are primarily pollutants of regional and local concern. Given the long atmospheric lifetimes, GHGs emitted by various sources worldwide accumulate in the atmosphere. No single emitter of GHGs is large enough to trigger global climate change on its own. Rather, climate change is the result of the individual contributions of countless past, present, and future sources. Therefore, GHG impacts are inherently cumulative, and the analysis above is inclusive of cumulative impacts.

4.8 Noise and Vibration

4.8.1 Introduction

This section describes the environmental and regulatory setting for noise and vibration. It also describes impacts associated with noise and vibration that would result from implementation of the proposed project and mitigation for significant impacts where feasible and appropriate.

San Francisco International Airport (SFO) submitted a comment on the Notice of Preparation (NOP). The commenter stated that the project site is outside of the 65 dB community noise equivalent level (CNEL) noise contour and is not within a runway end safety zone. As a result of being located outside of the 65 CNEL contour, the commenter stated that the proposed project would not pose an airport land use compatibility issue related to noise. The commenter also stated that noise impact to any sensitive receptors or nighttime uses associated with the proposed project should be evaluated in the EIR. The proposed project does not propose any nighttime uses or noise-sensitive uses, such as residences; the potential for noise impacts from aircraft activity is evaluated under Impact NOI-3.

4.8.2 Environmental Setting

4.8.2.1 Fundamentals of Environmental Noise

Overview of Noise and Sound

Noise is commonly defined as unwanted sound that annoys or disturbs people and potentially causes an adverse psychological or physiological effect on human health. Because noise is an environmental pollutant that can interfere with human activities, an evaluation of noise is necessary when considering the environmental impacts of a proposed project.

Sound is mechanical energy (i.e., vibration) transmitted by pressure waves over a medium such as air or water. Sound is characterized by various parameters, including the rate of oscillation of sound waves (i.e., frequency), the speed of propagation, and the pressure level or energy content (i.e., amplitude). In particular, the sound pressure level is the most common descriptor for characterizing the loudness of an ambient (i.e., existing) sound level. Although the decibel (dB) scale, which is a logarithmic scale, is used to quantify sound intensity, it does not accurately describe how sound intensity is perceived by human hearing. The human ear is not equally sensitive to all frequencies in the entire spectrum, so noise measurements are weighted more heavily for frequencies to which humans are sensitive in a process called A-weighting, written as dBA and referred to as A-weighted decibels. Table 4.8-1 defines sound measurements and other terminology used in this chapter, and Table 4.8-2 summarizes typical A-weighted sound levels for different noise sources.

In general, human sound perception is such that a change in sound level of 1 dB cannot typically be perceived by the human ear, a change of 3 dB is barely noticeable, a change of 5 dB is clearly noticeable, and a change of 10 dB is perceived as doubling or halving the sound level as it increases or decreases, respectively.

Table 4.8-1. Definition of Sound Measurements

Sound Measurements	Definition
Decibel (dB)	A unitless measure of sound on a logarithmic scale that indicates the squared ratio of sound pressure amplitude with respect to a reference sound pressure amplitude. The reference pressure is 20 micropascals.
A-Weighted Decibel (dBA)	An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.
C-Weighted Decibel (dBC)	The sound pressure level in decibels as measured using the C-weighting filter network. The C-weighting is very close to an unweighted or *flat* response. C-weighting is used only in special cases (i.e., when low-frequency noise is of particular importance). A comparison of the measured A- and C-weighted level gives an indication of low-frequency content.
Maximum Sound Level (L_{max})	The maximum sound level measured during the measurement period.
Minimum Sound Level (L_{min})	The minimum sound level measured during the measurement period.
Equivalent Sound Level (L_{eq})	The equivalent steady-state sound level that in a stated period of time would contain the same acoustical energy.
Percentile-Exceeded Sound Level (L_{xx})	The sound level exceeded X% of a specific time period. L_{10} is the sound level exceeded 10% of the time, and L_{90} is the sound level exceeded 90% of the time. L_{90} is often considered to be representative of the background noise level in a given area.
Day-Night Level (L_{dn})	The energy average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the A-weighted sound levels occurring during the period from 10:00 p.m. to 7:00 a.m.
Community Noise Equivalent Level (CNEL)	The energy average of the A-weighted sound levels occurring during a 24-hour period, with 5 dB added to the A-weighted sound levels occurring during the period from 7:00 p.m. to 10:00 p.m. and 10 dB added to the A-weighted sound levels occurring during the period from 10:00 p.m. to 7:00 a.m.
Vibration Velocity Level (or Vibration Decibel Level, VdB)	The root-mean-square velocity amplitude for measured ground motion expressed in dB.
Peak Particle Velocity (Peak Velocity or PPV)	A measurement of ground vibration, defined as the maximum speed (measured in inches per second) at which a particle in the ground is moving relative to its inactive state. PPV is usually expressed in inches per second.
Frequency: Hertz (Hz)	The number of complete pressure fluctuations per second above and below atmospheric pressure.

Table 4.8-2. Typical A-weighted Sound Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	—110—	Rock band
Jet flyover at 1,000 feet		
	—100—	
Gas lawnmower at 3 feet		
	—90—	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	—80—	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawnmower at 100 feet	—70—	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	—60—	
		Large business office
Quiet urban daytime	—50—	Dishwasher in next room
Quiet urban nighttime	—40—	Theater, large conference room (background)
Quiet suburban nighttime		
	—30—	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	—20—	
		Broadcast/recording studio
	—10—	
	—0—	

Source: Federal Transit Administration. 2018. *Transit Noise and Vibration Impact Assessment*. FTA Report 0123. Available: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf. Accessed: May 20, 2020.

Different types of measurements are used to characterize the time-varying nature of sound. These measurements include the equivalent sound level (Leq), the minimum and maximum sound levels (Lmin and Lmax), percentile-exceeded sound levels (such as L10, L20), the day-night sound level (Ldn), and the CNEL. Ldn and CNEL values differ by less than 1 dB. As a matter of practice, Ldn and CNEL values are considered to be equivalent and are treated as such. These measurements are defined in Table 4.8-1.

For a point source, such as a stationary compressor or a piece of construction equipment, sound attenuates (i.e., lessens in intensity), based on geometry, at a rate of 6 dB per doubling of distance. For a line source, such as free-flowing traffic on a freeway, sound attenuates at a rate of 3 dB per doubling of distance perpendicular to the source.[1] Atmospheric conditions, including wind, temperature gradients, and humidity, can change how sound propagates over distance and can affect the level of sound received at a given location. The degree to which the ground surface absorbs acoustical energy also affects sound propagation. Sound that travels over an acoustically absorptive surface such as grass attenuates at a greater rate than sound that travels over a hard surface such as pavement. The increased attenuation is typically in the range of 1 to 2 dB per doubling of distance. Barriers such as buildings or topographic features that block the line of sight between a source and receiver also increase the attenuation of sound over distance.

Community noise environments are generally perceived as quiet when the 24-hour average noise level is below 45 dBA, moderate in the 45 to 60 dBA CNEL range, and loud above 60 dBA CNEL. Very noisy urban residential areas are usually around 70 dBA CNEL. Along major thoroughfares, roadside noise levels are typically between 65 and 75 dBA CNEL. Incremental changes of 3 to 5 dB in the existing 1-hour Leq, or the CNEL, are commonly used as thresholds for an adverse community reaction to a noise increase. However, there is evidence that incremental thresholds in this range may not be sufficiently protective in areas where noise-sensitive uses are located and CNEL is already high (i.e., above 60 dBA). In these areas, limiting noise increases to 3 dB or less is recommended.[2] Noise intrusions that cause short-term interior noise levels to rise above 45 dBA at night can disrupt sleep. Exposure to noise levels greater than 85 dBA for 8 hours or longer can cause permanent hearing damage.

Noise from Multiple Sources

Since sound pressure levels in decibels are based on a logarithmic scale, they cannot be added or subtracted in the usual arithmetical way. Adding a new noise source to an existing noise source, both producing noise at the same level, will not double the noise level. If the difference between two noise sources is 10 dBA or more, the higher noise source will dominate and the resultant noise level will be equal to the noise level of the higher noise source. In general, if the difference between two noise sources is 0 to 1 dBA, the resultant noise level will be 3 dBA higher than the higher noise source, or both sources if they are equal. If the difference between two noise sources is 2 to 3 dBA, the resultant noise level will be 2 dBA above the higher noise source. If the difference between two noise sources is 4 to 10 dBA, the resultant noise level will be 1 dBA higher than the higher noise source.

Attenuation of Noise

A receptor's distance from a noise source affects how noise levels attenuate (decrease). Transportation noise sources tend to be arranged linearly such that roadway traffic attenuates at a rate of 3.0 to 4.5 dBA per doubling of distance from the source, depending on the intervening surface (paved or vegetated, respectively). Point sources of noise, such as stationary equipment or construction equipment, typically attenuate at a rate of 6.0 to 7.5 dBA per doubling of distance from

---

1 California Department of Transportation (Caltrans). 2020. *Transportation and Construction Vibration Guidance Manual*. April. Available: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf. Accessed May 20, 2020.

2 Federal Transit Administration (FTA). 2018. *Transit Noise and Vibration Impact Assessment*. FTA Report 0123. Available: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf. Accessed: May 20, 2020.

the source, depending on the intervening surface.[3] For example, a sound level of 80 dBA at 50 feet from the noise source will be reduced to 74 dBA at 100 feet, 68 dBA at 200 feet, and so on, based on the 6 dB point source reduction over a non-absorptive surface (e.g. pavement instead of vegetation). Noise levels can also be attenuated by "shielding" or providing a barrier between the source and the receptor. With respect to interior noise levels, noise attenuation effectiveness depends on whether windows are closed or open. Based on the U.S. Environmental Protection Agency's (EPA's) national average, closed windows reduce noise levels by approximately 25 dBA and open windows reduce noise levels by about 15 dBA.[4]

Noise-Sensitive Land Uses

Noise-sensitive land uses are generally defined as locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Noise-sensitive land uses typically include single- and multi-family residential areas, health care facilities, lodging facilities, and schools. Noise-sensitive land uses where people typically sleep are typically more sensitive to noise during nighttime hours (when people are typically sleeping). Recreational areas where quiet is an important part of the environment as well as some commercial areas, such as outdoor restaurant seating areas, can also be considered sensitive to noise.

Overview of Ground-borne Vibration

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Several different methods are typically used to quantify vibration amplitude; one is peak particle velocity (PPV) and another is root mean square (RMS) velocity. PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. RMS velocity is defined as the average of the squared amplitude of the signal. Vibration is typically measured in inches per second or millimeters per second.

Operation of heavy construction equipment, particularly pile-driving equipment and other impact devices (e.g., pavement breakers), creates seismic waves that radiate along the surface of and downward into the ground. These surface waves can be felt as ground vibration. Vibration from the operation of this type of equipment can result in effects that range from annoyance for people to damage for structures. Variations in geology and distance result in different vibration levels, including different frequencies and displacements. In all cases, vibration amplitudes decrease with increased distance.

Perceptible ground-borne vibration is generally limited to areas within a few hundred feet of construction activities. As seismic waves travel outward from a vibration source, they cause rock and soil particles to oscillate. The actual distance that these particles move is usually only a few ten-thousandths to a few thousandths of an inch. The rate or velocity (in inches per second) at which these particles move is the commonly accepted descriptor of vibration amplitude, referred to as PPV.

---

[3] The 1.5-dBA variation in attenuation rate (6 dBA vs. 7.5 dBA) can result from ground-absorption effects, which occur as sound travels over soft surfaces such as soft earth or vegetation (7.5 dBA attenuation rate) versus hard ground such as pavement or very hard-packed earth (6 dBA rate) (U.S. Housing and Urban Development, *The Noise Guidebook*, 1985, p. 24. Available online at: https://www.hudexchange.info/onecpd/assets/File/Noise-Guidebook-Chapter-4.pdf. Accessed May 20, 2020.)

[4] U.S. Environmental Protection Agency, 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*, Appendix B, Table B-4, p. B-6, March 1974.

Vibration amplitude attenuates over distance. This is a complex function of how energy is imparted into the ground and the soil or rock conditions through which the vibration is traveling. The following equation is used to estimate the vibration level at a given distance for typical soil conditions.[5] PPV_{ref} is the reference PPV at 25 feet (Table 4.8-3).

$$PPV = PPV_{ref} \times (25/Distance)^{1.5}$$

Table 4.8-3. Vibration Source Levels for Construction Equipment

Equipment	PPV at 25 Feet	PPV at 50 Feet	PPV at 75 Feet	PPV at 80 Feet	PPV at 100 Feet
Auger drill	0.089	0.0315	0.0171	0.016	0.011
Hoe ram	0.089	0.0315	0.0171	0.016	0.011
Large bulldozer	0.089	0.0315	0.0171	0.016	0.011
Loaded trucks	0.076	0.0269	0.0146	0.013	0.010
Jackhammer	0.035	0.0124	0.0067	0.006	0.004
Small bulldozer	0.003	0.0011	0.0006	0.001	0.0004

Source: Federal Transit Administration. 2018. *Transit Noise and Vibration Impact Assessment*. FTA Report 0123. Available: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf. Accessed: May 20, 2020.

Table 4.8-3 summarizes typical vibration levels generated by construction equipment at the reference distance of 25 feet and other distances, as determined with use of the attenuation equation above.[6] Tables 4.8-4 and 4.8-5 summarize the guidelines developed by the California Department of Transportation (Caltrans) for damage and annoyance potential from the transient and continuous vibration that is usually associated with construction activity. The activities that are typical of continuous vibration include the use of excavation equipment, static compaction equipment, tracked vehicles, vehicles on a highway, vibratory pile drivers, pile-extraction equipment, and vibratory compaction equipment. The activities that are typical of single-impact (transient) or low-rate, repeated impact vibration include the use of drop balls, blasting, and the use of impact pile drivers, "pogo stick" compactors, and crack-and-seat equipment.[7]

4.8.2.2 Existing Noise Environment

Regional and Local Setting

The project site is in the City of South San Francisco in northern San Mateo County. The project site is served by Gateway Boulevard as the primary arterial road, fed by Oyster Point Boulevard (running east to west) to the north and East Grand Avenue (running east to west) to the south. In addition, the project site is approximately 0.5 mile north of the South San Francisco Caltrain station and approximately 0.2 mile east of U.S. 101. SFO is approximately 2 miles south of the project site.

[5] Federal Transit Administration. 2018. *Transit Noise and Vibration Impact Assessment*. FTA Report 0123. Available: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf. Accessed: May 20, 2020.

[6] California Department of Transportation. 2020. *Transportation and Construction Vibration Guidance Manual*. April. Available: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf. Accessed May 20, 2020.

[7] Ibid.

Table 4.8-4. Vibration Damage Potential Threshold Criteria Guidelines

Structure and Condition	Maximum PPV (inches per second) Transient Sources	Maximum PPV (inches per second) Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Source: California Department of Transportation. 2020. *Transportation and Construction Vibration Guidance Manual*. April. Available: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf. Accessed May 20, 2020.

Note: Transient sources create a single, isolated vibration event (e.g., blasting or the use of drop balls). Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Table 4.8-5. Vibration Annoyance Potential Criteria Guidelines

Human Response	Maximum PPV (inches per second) Transient Sources	Maximum PPV (inches per second) Continuous/Frequent Intermittent Sources
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.9	0.10
Severe	2.0	0.4

Source: California Department of Transportation. 2020. *Transportation and Construction Vibration Guidance Manual*. April. Available: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf. Accessed May 20, 2020.

Note: Transient sources create a single, isolated vibration event (e.g., blasting or the use of drop balls). Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Existing Uses at the Project Site

The project site is located in the Gateway Campus, an area with primarily commercial and office uses. The project site is bounded by a commercial and office building (901 Gateway Boulevard) and a surface parking lot to the north, Gateway Boulevard to the east, a surface parking lot to the south, and commercial and office buildings to the west.

Existing Noise-Sensitive Uses in the Vicinity

There are no residential land uses located within 1,000 feet of the project site; the nearest residential land uses are located along Airport Boulevard, over 1,200 feet from the project site. Two hotels, Larkspur Landing and Hilton Garden Inn, are within 600 and 900 feet of the main project construction areas, respectively, and the Gateway Child Development Center Peninsula is approximately 1,000 feet from the main project construction areas. However, the Gateway Child Development Center Peninsula is approximately 670 feet from the nearest project construction area, which would be at the southern terminus of the site and include repaving and curb work, as well as some landscaping activities. This construction area is approximately 300 feet from the Larkspur Landing Hotel and 400 feet from the Hilton Garden Inn. The project site is in the Gateway Specific Plan Area, which includes a variety of commercial (including hotel and childcare) and R&D land uses. As shown in Figure 3-3 in Chapter 3, Project Description, of this draft EIR, the parcels in the vicinity of the project site are zoned Gateway Specific Plan District (GSPD).

Existing Noise Levels

The existing ambient noise environment at the project site is characteristic of an urban environment (e.g., highway and local traffic, aircraft overflights, commercial noise sources). Traffic noise from vehicles traveling on surrounding streets and freeways (e.g., U.S. 101) is typically the dominant noise source in urban areas. Traffic noise is the primary source contributing to ambient noise levels at the project site. In addition to traffic noise, noise from aircraft overflights traveling to or from SFO, approximately 2 miles south of the project site, is sometimes audible at the project site. The Caltrain right-of-way is located along the western boundary of the Gateway Campus. Thus, intermittent Caltrain noise also contributes to the noise environment in the project area.

As discussed above, traffic noise is the primary source contributing to ambient noise levels in the project vicinity. Thus, to estimate existing ambient noise levels at and around the project site, existing traffic noise levels in the project area were modeled based on traffic data provided by Fehr & Peers. Refer to Table 4.8-6 for modeled existing noise levels along roadway segments within approximately 0.5 mile of the project site.

4.8.3 Regulatory Framework

4.8.3.1 State

California Code of Regulations

California Code of Regulations Title 24, part 2, *Sound Transmission*, establishes minimum noise insulation standards to protect persons within new hotels, motels, dormitories, long-term care facilities, apartment houses, and dwellings other than single-family residences. Under this regulation, interior noise levels attributable to exterior noise sources cannot exceed 45 dB in any habitable room. The noise metric is either the L_{dn} or the CNEL. Compliance with Title 24 interior noise standards occurs during the permit review process and generally protects a proposed project's users from existing ambient outdoor noise levels. If determined necessary, a detailed acoustical analysis of exterior wall and window assemblies may be required.

4.8.3.2 Regional

Comprehensive Airport Land Use Compatibility Plan8

Refer to Section 4.10.3, *Hazards and Hazardous Materials*, of this draft EIR for a discussion of the 2012 SFO Airport Land Use Compatibility Plan (ALUCP). Noise associated with airport and aircraft operations is considered one of the main areas of important concern for airport land use commissions, especially in highly urbanized areas like the Bay Area.

[8] C/CAG. 2012. *Comprehensive Airport Land Use Compatibility Plan for the Environs of San Francisco International Airport*. November 2012. Available: https://ccag.ca.gov/wp-content/uploads/2014/10/Consolidated_CCAG_ALUCP_November-20121.pdf. Accessed: March 27, 2020.

Table 4.8-6. Modeled Existing Noise Levels within 0.5 mile of the Project Site

Roadway	Segment	Existing Noise Level (dBA Ldn)
Airport Boulevard	North of Sister Cities Boulevard	65.4
Airport Boulevard	South of Sister Cities Boulevard	64.1
Airport Boulevard	North of Grand Avenue	65.3
Airport Boulevard	South of Grand Avenue	65.5
Sister Cities Boulevard	East of Airport Boulevard	69.3
Sister Cities Boulevard	West of Airport Boulevard	68.8
Oyster Point Boulevard	East of Dubuque Avenue	66.2
Oyster Point Boulevard	West of Dubuque Avenue	69.1
Oyster Point Boulevard	East of Gateway Boulevard	69.0
Oyster Point Boulevard	West of Gateway Boulevard	69.9
Gateway Boulevard	South of Oyster Point Boulevard	66.0
Gateway Boulevard	North of East Grand Avenue	65.2
Gateway Boulevard	South of East Grand Avenue	65.3
East Grand Avenue	East of Gateway Boulevard	68.8
East Grand Avenue	West of Gateway Boulevard	68.1
Grand Avenue	East of Airport Boulevard	67.1
Grand Avenue	West of Airport Boulevard	64.5
Dubuque Avenue	South of Oyster Point Boulevard	67.9
Dubuque Avenue	South of U.S. 101 Ramps	61.6

Note: Due to the COVID-19 shelter-in-place orders that were in effect at the time of the draft EIR preparation, existing noise levels were modeled based on traffic data for year 2019 rather than based on noise measurements taken in the field. Traffic noise is usually the dominant source of overall ambient noise in urban areas, and field work conducted during the shelter-in-place orders would not accurately capture typical traffic noise levels (with schools and many businesses closed and many people working remotely). Thus, the modeled traffic noise levels provide a reasonable approximation for typical ambient noise levels in the vicinity of the project site. In addition, the modeled traffic noise levels for the project area are generally similar to measured pre-COVID-19 noise levels for other projects in the area, including the 499 Forbes Boulevard Office Project EIR and the 201 Haskins Way Project Draft EIR.

Source: Traffic volumes provided by Fehr & Peers. Modeling conducted using a spreadsheet based on the Federal Highway Administration (FHWA) Traffic Noise Model (TNM), version 2.5 at a fixed distance of 50 feet from the roadway centerline.

.

According to the 2012 SFO ALUCP, the Airport Influence Area (AIA), which is the geographic area that is subject to the land use compatibility considerations identified in the ALUCP, is divided into two areas: Area A and Area B. Area A encompasses all of San Mateo County and the incorporated cities within it. Area B roughly follows the noise compatibility and safety zone contours. Consistent with Title 14 of the Code of Federal Regulations (CFR) Part 77, the 2012 SFO ALUCP establishes height restrictions within specific contours of airport facilities throughout Area A and Area B. The project site is located within both Area A and Area B.

The 2012 SFO ALUCP has four primary areas of concern, two of which pertain to noise, as listed below.

1. Aircraft Noise Impact Reduction: To reduce the potential number of future airport area residents who could be exposed to noise impacts from airport and aircraft operations.
2. Over-flight Notification: To establish an area within which aircraft flights to and from the airport occur frequently enough and at a low enough altitude to be noticeable by sensitive residents. Within this area, real estate disclosure notices shall be required, pursuant to state law.

According to the 2012 SFO ALUCP, the project site is not located within the CNEL 65 dB noise contour[9] or any safety zones.[10]

4.8.3.3 Local

South San Francisco General Plan

The 1999 General Plan for the City of South San Francisco (City) provides a vision for long-range physical and economic development of the City, provides strategies and specific implementing actions, and establishes a basis for judging whether specific development proposals and public projects are consistent with the City's plans and policy standards. The General Plan contains a Noise Element, which is intended to ensure compliance with state requirements and promote a comprehensive, long-range program of achieving acceptable noise levels throughout the City.

The General Plan includes the following policies applicable to noise and vibration.

- Policy 9-I-7: Where site conditions permit, require noise buffering for all noise-sensitive development subject to noise generators producing noise levels greater than 65 dB CNEL. This noise attenuation method should avoid the use of visible sound walls, where practical.
- Policy 9-I-8: Require the control of noise at source through site design, building design, landscaping, hours of operation, and other techniques, for new developments deemed to be noise generators.

Local plans, policy actions, or development activities within SFO's 65 dB CNEL contour require the approval of the San Mateo County Airport Land Use Commission (ALUC) prior to local permit issuance. To assist this process, the ALUC has established noise/land use compatibility standards as the basis of plan review, which are included in the City's General Plan Noise Element (see Table 9.2-1). The City also applies these standards in its review of development applications located within the 65 dB CNEL boundary. The standards are shown below in Table 4.8.7. As previously noted, the project site is located outside of the 65 dB CNEL boundary.

South San Francisco Municipal Code

Chapter 8.32, Noise Regulations, contains the noise regulations of the South San Francisco Municipal Code. The code's quantitative noise limits and construction noise regulations are described below.

---

[9] Exhibit IV-5, *Noise Compatibility Zones* in the 2012 SFO ALUCP.
[10] Exhibit IV-2, Airport Influence Area B – Land Use Policy Action/Project Referral Area in the 2012 SFO ALUCP.

Table 4.8-7. General Plan Land Use Criteria for Noise-Impacted Areas

Land Use	CNEL Range	General Land Use Criteria
Residential	Less than 65	Satisfactory; no special insulation requirements
	65 to 70	Development requires analysis of noise reduction requirements and insulation as needed
	Over 70	Development should not be undertaken
Commercial	Less than 70	Satisfactory; no special insulation requirements
	70 to 80	Development requires analysis of noise reduction requirements and insulation as needed
	Over 80	Airport-related development only; special noise insulation should be provided
Industrial	Less than 75	Satisfactory; no special insulation requirements
	75 to 85	Development requires analysis of noise reduction requirements and insulation as needed
	Over 85	Airport-related development only; special noise insulation should be provided
Open	Less than 75	Satisfactory; no special insulation requirements
	Over 75	Avoid uses involving concentrations of people or animals

Source: South San Francisco General Plan, Noise Element.

Table 4.8-8 specifies the maximum permissible sound levels to be generated by any property within the City according to Section 8.32.030 of the City's Noise Ordinance. The maximum allowable level is determined by the land use category of the receiving property and is measured on any receiving property. All references to dB in the code use the A-weighting scale. All land uses within the Gateway Specific Plan Area are governed by noise thresholds of 65 dBA during the daytime hours of 7 a.m. to 10 p.m. and 60 dBA during the nighttime hours of 10 p.m. to 7 a.m.

Table 4.8-8. City of South San Francisco Noise Level Standards

Land Use Category	Time Period	Noise Level (dB)[a]
R-E, R-1 and R-2 zones or any single-family or duplex residential in a specific plan district	10:00 p.m.—7:00 a.m.	50
	7:00 a.m.—10:00 p.m.	60
R-3 and D-C zones or any multiple-family residential or mixed residential/commercial in any specific plan district	10:00 p.m.—7:00 a.m.	55
	7:00 a.m.—10:00 p.m.	60
C-1, P-C, Gateway and Oyster Point Marina specific plan districts or any commercial use in any specific plan district	10:00 p.m.—7:00 a.m.	60
	7:00 a.m.—10:00 p.m.	65
M-1, P-1	Anytime	70

Source: Table 8.32.030 of the South San Francisco Municipal Code

[a] The noise level standard for each land use for a cumulative period of more than thirty minutes in any hour (L50). Standards increase for durations less than 15 minutes per hour.

If the measured ambient level for any area is higher than the standard set in the City Municipal Code, then the threshold is 5 dB above the measured ambient level.

Section 20.300.010(F) of the South San Francisco Municipal Code states that no vibration shall be produced that is transmitted through the ground and is discernible without the aid of instruments by a reasonable person at the lot lines of the site. Vibration from temporary construction, demolition, and vehicles that enter and leave the subject parcel (e.g., construction equipment, trains, trucks) are exempt from this standard.

Section 8.32.050 (d) of the South San Francisco Municipal Code identifies a special provision that allows construction activities with a City permit between the hours of 8:00 a.m. to 8:00 p.m. on weekdays, 9:00 a.m. to 8:00 p.m. on Saturdays, and 10:00 a.m. to 6:00 p.m. on Sundays and holidays. Other hours may be authorized by obtaining a permit, provided the construction meets at least one of the following requirements.

- No individual piece of equipment shall produce a noise level exceeding 90 dB at a distance of 25 feet. If the device is housed within a structure or trailer on the property, the measurement shall be made outside the structure at a distance as close to 25 feet from the equipment as possible.
- The noise level at any point outside of the property plane of the project shall not exceed 90 dB.

Gateway Specific Plan

The *Gateway Specific Plan* covers the portion of the *East of 101 Area Plan* from east of the Caltrain tracks to the eastern boundary of the parcels along the east side of Gateway Boulevard and the area between Oyster Point Boulevard and Grand Avenue on the northern and southern boundaries. The Specific Plan is "intended to provide for various commercial and research and development land uses integrated by consistent development standards." The *Gateway Specific Plan* includes the following construction standards and open space standards applicable to noise.

- Construction Standard 1(c): Noise Abatement.
  (1) Buildings shall be designed and oriented on the Site to reduce interior noise levels within the Buildings caused by on-site activities or by adjacent highways, roads, flight paths or rail facilities to a level complying with all then applicable federal, state, and local health and safety requirements. Noise generated on a Site during construction or in areas outside completed Buildings shall be minimized as necessary to avoid creation of a nuisance.
  (2) All construction contracts for any work to be performed on a Site shall require the contractor to comply with all applicable federal, state and local governmental requirements relating to noise limitations on construction vehicles and equipment.

East of 101 Area Plan

The *East of 101 Area Plan*, which was adopted in 1994 and most recently amended in 2016, sets forth specific land use policies for the East of 101 Area. The City interprets the *East of 101 Area Plan* as a design-level document. Per Policy IM-5, the *Gateway Specific Plan* is not affected by the land use regulations of the *East of 101 Area Plan*. Therefore, the policies in the General Plan Noise Element are the guiding policies and supersede all Noise Element policies set forth in Chapter 9 of the *East of 101 Area Plan*. Nonetheless, the *East of 101 Area Plan* contains the following goals and policies applicable to noise.

- Goal 6.1: Encourage the development of land uses which will be compatible with the noise environment of the East of 101 Area.
- Goal 6.2: Provide guidelines for noise attenuation for hotel and office uses in the East of 101 Area.
- Policy NO-2: Office and retail developments in the East of 101 Area shall be designed so that the calculated hourly average noise levels during the daytime does not exceed an Leq of 45 dBA, and instantaneous maximum noise levels do not exceed 60 dBA.
- Policy NO-4: New development shall be designed so that the average noise level resulting from the new development does not exceed an Leq of 60 dBA at the nearest open space or recreational area.

4.8.4 Impacts and Mitigation Measures

4.8.4.1 Significance Criteria

Based on Appendix G of the CEQA Guidelines, the proposed project would have a noise and vibration impact if it would:

- Generate 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;
- Generate excessive ground-borne vibration or ground-borne noise levels; or
- 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, expose people residing or working in the project area to excessive noise levels.

4.8.4.2 Approach to Analysis

This noise and vibration impact analysis evaluates the temporary noise and vibration increases associated with project construction and demolition activities, traffic noise associated with project-related changes in traffic patterns, and operational noise generated by sound-generating equipment and onsite activities.

Construction and Demolition Noise

The construction schedule, a list of construction equipment expected to be used for each construction stage, and construction equipment operating details were provided by the project sponsor. Noise impacts associated with onsite demolition and construction were evaluated using construction equipment noise data in the Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM). The data include the A-weighted L_{max}, measured at a distance of 50 feet from the construction equipment and the utilization factors for the equipment. The utilization factor is the percentage of time each piece of construction equipment is typically operated at full power over the specified time period. It is used to estimate L_{eq} values from L_{max} values. For example, the L_{eq} value for a piece of equipment that operates at full power over 50 percent of the time is 3 dB less than the L_{max} value.[11]

Construction noise levels of typical equipment from the FHWA RCNM user guide were compared to the applicable construction noise thresholds during daytime hours. For construction outside of these daytime hours, the FHWA RCNM the noise calculation methods were used to estimate reasonable worst-case noise from the loudest two pieces of equipment proposed for use during a single construction phase. Estimated construction noise levels were compared against the maximum permissible sound levels according to Section 8.32.030 of the City's Noise Ordinance, which are identified in Table 4.8-8. For this analysis, L_{eq} is considered a reasonable proxy for assessing noise against the L_{50} standards[12] in Table 4.8-8.

---

[11] Federal Highway Administration (FHWA). 2006. *FHWA Roadway Construction Noise Model User's Guide*. FHWA-HEP-05-054. January. Available: https://www.gsweventcenter.com/Draft_SEIR_References/2006_01_Roadway_Construction_Noise_Model_User_Guide_FHWA.pdf. Accessed: May 20, 2020.

[12] L_{50} is the noise level standard for each land use for a cumulative period of more than 30 minutes in any hour.

Traffic Noise During Operation

Noise impacts associated with increased traffic volumes generated by the proposed project were evaluated for the following conditions, which are described in Section 4.9, *Transportation and Circulation*, of this draft EIR.

- Existing Conditions
- Existing Plus Project Conditions
- Cumulative Conditions
- Cumulative Plus Project Conditions

Quantitative modeling of traffic noise that may be generated by the proposed project was conducted using a spreadsheet that was based on the FHWA TNM version 2.5. The spreadsheet calculates the traffic noise level at a fixed distance from the centerline of a roadway based on the traffic volume, roadway speed, and vehicle mix, which is predicted to occur under each condition. Traffic volumes were provided by Fehr & Peers and traffic noise levels were modeled to estimate potential traffic noise increases along the major vehicle access routes resulting from project implementation. A reasonable default vehicle mix (i.e., the proportion of automobiles, trucks, buses, and other vehicles) was used in the model, and were based on guidance from Fehr & Peers; roadway speeds were obtained from Google Earth StreetView. Traffic noise was evaluated in terms of how project-related noise increases could affect existing noise-sensitive land uses.

As discussed above, a change of 3 dB is barely noticeable, a change of 5 dB is clearly noticeable, and a change of 10 dB is perceived as doubling or halving the sound level as it increases or decreases. The City's noise regulations and guidance documents do not include a specific threshold that pertains to traffic noise impacts from implementation of a project. The following criteria to determine potential project-related traffic noise impacts.

A project impact related to traffic noise would be identified if:

- A 5 dBA or greater increase in traffic noise resulting from project implementation occurs, if the future noise level is within the normally acceptable range (CNEL 65 dBA or less for residences and childcare; CNEL 70 dBA or less for offices and retail).
- A 3 dBA or greater increase in traffic noise resulting from project implementation occurs, if future noise level is above the normally acceptable range.

A cumulative impact related to traffic noise would be identified if:

- A 5 dBA or greater increase in traffic noise from existing to cumulative with project conditions occurs, if the future noise level is within the normally acceptable range (CNEL 65 dBA or less for residences and childcare; CNEL 70 dBA or less for offices and retail; CNEL 75 dBA or less for industrial land uses) AND the project's contribution is cumulatively considerable (greater than 1 dBA).
- A 3 dBA or greater increase in traffic noise from existing to cumulative with project conditions occurs, if future noise level is above the normally acceptable range AND the project's contribution is cumulatively considerable (greater than 1 dBA).

Stationary Source Noise During Operation

Operational noise impacts associated with proposed onsite activities and stationary sources of noise were evaluated based on the proposed site plan layout and the types of noise-generating equipment and activities that are anticipated under the proposed project. In accordance with applicable South San Francisco Municipal Code noise thresholds, the proposed mechanical equipment may not result in noise levels at nearby land uses in the Gateway Specific Plan Area in excess of 65 dBA during the hours of 7:00 a.m. to 10:00 p.m. or in excess of 60 dBA during the hours of 10:00 p.m. to 7:00 a.m. Noise at various distances from point sources (e.g., stationary operational equipment such as generators and heating and cooling equipment) was estimated using point-source attenuation of 6 dB per doubling of distance. The South San Francisco Municipal Code also provides if measured ambient noise levels are higher than the standards set forth Table 4.8-8, generated noise levels may exceed measured ambient noise levels by up to 5 dB. For purposes of this analysis, the thresholds outlined in Table 4.8-8, which are more conservative, are used.

4.8.4.3 Impact Evaluation

Impact NOI-1: The proposed project would not generate 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. (*Less than Significant with Mitigation*)

Construction Equipment Noise

Construction and demolition activities for the proposed project would include demolishing a surface parking lot, constructing a new building, undertaking various site improvements, and providing utility infrastructure. Construction of the proposed project, if the related entitlements are approved by the City, would begin in 2020 and occur over approximately 18 months, with an anticipated completion date in 2021.

Construction and demolition activities would generate noise and temporarily increase noise levels onsite and at nearby land uses. The level of noise generated would depend on the types of construction equipment used, the timing and duration of noise-generating activities, and the distance between construction noise sources and noise-sensitive receptors. Potential construction noise impacts are typically more substantial when construction occurs during noise-sensitive times of the day (i.e., early morning, evening, or nighttime hours) in areas immediately adjoining noise-sensitive land uses or for extended periods of time.

Construction Noise Impacts During Daytime Hours

As described in *Regulatory Framework*, construction activities in the City that are authorized by a valid City permit are generally allowed on weekdays between the hours of 8:00 a.m. and 8:00 p.m., on Saturdays between the hours of 9:00 a.m. and 8:00 p.m., and on Sundays and holidays between the hours of 10:00 a.m. and 6:00 p.m. (or at such other hours as may be authorized by the permit) if they meet at least one of two outlined noise limitations. Construction would be allowed during the daytime hours specific on the permit as long as noise from each individual piece of equipment is limited to 90 dB at a distance of 25 feet or as long as combined construction noise at any point outside of the property plane of the project does not exceed 90 dB.

Noise levels for the equipment proposed for project construction are provided in Table 4.8-9. As shown, noise from each individual piece of equipment proposed for project construction would not be expected to exceed 90 dBA L_{eq} at a distance of 25 feet. For this reason, construction that takes place during daytime hours defined by the South San Francisco Municipal Code would not conflict with local construction noise regulations and this impact would be ***less than significant***. No mitigation measures are required.

Table 4.8-9. Noise from Equipment Proposed for Project Construction (L_{eq})

Construction Stage	Equipment Type	Noise at 25 Feet (Leq)
Site Preparation and Demolition	Excavator	83
	Crusher	89
	Dump Truck	78
Foundation Installation	Excavator	83
	Dump Truck	78
	Concrete Mixer Truck	81
	Concrete Pump Truck	80
Building Structure Construction	Crane	79
	Welder	76
	Man lift	74
	Gradall	85
Exterior and Roof Buildout	Mobile Crane	79

Construction Noise Impacts Outside of Daytime Hours

Outside of the daytime hours specified by the City permit, construction noise would be regulated by Section 8.32.030 of the City of South San Francisco Municipal Code (Table 4.8-8). The project site is in the Gateway Specific Plan District (GSPD) per the City Municipal Code. Noise at in this district are is limited to the same noise level standard regardless of the type of land use. For example, both a hotel and an office building in the district would be governed by the same noise standard of 60 dBA during the nighttime hours of 10:00 p.m. to 7:00 a.m. and 65 dBA during the daytime hours of 7:00 a.m. to 10:00 p.m.

Project construction would typically occur Monday through Friday, between 7:00 a.m. and 5:00 p.m., although some work is anticipated to occur on Saturdays between 9:00 a.m. and 8:00 p.m. or on Sundays between 10:00 a.m. and 6:00 p.m. Between the hours of 7:00 and 8:00 a.m., construction noise in the City is restricted to the more stringent general noise standard criteria of 65 dBA rather than the individual equipment threshold or property line construction noise threshold of 90 dBA. Therefore, the reasonable worst-case combined construction noise must be estimated to determine potential construction noise impacts between 7:00 and 8:00 a.m.

To estimate the reasonable worst-case combined construction noise levels from the use of construction equipment during project construction, this analysis assumes the three loudest pieces of equipment proposed for a single construction stage would operate concurrently in the same general location on the project site. The screening analysis determined that the site preparation and demolition stage, during which a dump truck, crusher and excavator could all operate simultaneously, would have the potential to produce the highest sound level of all construction stages. Table 4.8-10 identifies the combined noise level (both L_{max} and L_{eq}) from operation of these three pieces of construction equipment and the anticipated reasonable worst-case noise levels during project construction at various distances from the project site.

Table 4.8-10. Combined Project Construction Noise Levels at Various Distances from 7:00 to 8:00 am (L_{max} and L_{eq})[a]

Source Data	Maximum Sound Level (dBA)	Utilization Factor (%)	L_{eq} Sound Level (dBA)
Construction Stage: Site Preparation and Demolition			
Source 1: Dump truck—Sound level (dBA) at 50 feet =	76	40	72.0
Source 2: Excavator—Sound level (dBA) at 50 feet =	81	40	77.0
Source 3: Crusher—Sound level (dBA) at 50 feet =	87	40	83.0
Calculated Data			
All Sources Combined—L_{max} sound level (dBA) at 50 feet =			88 L_{max}
All Sources Combined—L_{eq} sound level (dBA) at 50 feet =			84 L_{eq}
Distance Between Source and Receiver (feet)	**Geometric Attenuation (dB)[b]**	**Calculated L_{max} Sound Level (dBA)[c]**	**Calculated L_{eq} Sound Level (dBA)[c]**
25	6	94	90
45[d]	**1**	**89**	**85**
50	0	88	84
100	-6	82	78
200	-12	76	72
400	-18	70	66
500	-20	68	64
600	-22	67	63
900	-25	63	59

Source: Federal Highway Administration (FHWA). 2006. *FHWA Roadway Construction Noise Model User's Guide*. FHWA-HEP-05-054. January. Available: https://www.gsweventcenter.com/Draft_SEIR_References/2006_01_Roadway_Construction_Noise_Model_User_Guide_FHWA.pdf. Accessed: May 20, 2020.

Notes:

[a] This analysis is to estimate construction noise from activities that occur outside of the standard daytime construction hours defined by the municipal code (e.g. between the hour of 7:00 and 8:00 a.m.).

[b] Geometric attenuation based on 6 dB per doubling of distance.

[c] This calculation does not include the effects, if any, of local shielding or ground attenuation from walls, topography, or other barriers that may reduce sound levels further.

[d] **Bolded** results: Results at 45 feet are **bolded** because 45 feet is the approximate distance to the nearest existing land uses to project construction areas (701 Gateway Boulevard and 901 Gateway Boulevard).

The nearest existing land uses to project construction areas are the buildings at 701 Gateway and 901 Gateway, which are both located approximately 45 feet from project construction areas.

As shown in Table 4.8-11, the reasonable worst-case combined construction noise is expected to be approximately 85 dBA L_{eq} at a distance of 45 feet. Construction activities are proposed during the hours of 7:00 and 8:00 a.m. weekdays, which is outside of the normal construction hours outlined in the South San Francisco Municipal Code and construction noise during this hour could be in excess of the 65 dBA threshold at the nearest noise-sensitive land use. Therefore, construction that takes place between 7:00 and 8:00 a.m. on weekdays could conflict with local construction noise regulations and this impact would be ***significant***.

Table 4.8-11. Combined Project Construction Noise Levels at Various Distances During Nighttime Concrete Pours (L_{max} and L_{eq})

Source Data	Maximum Sound Level (dBA)	Utilization Factor (%)	L_{eq} Sound Level (dBA)
Construction Condition: Nighttime Concrete Pour			
Source 1: Concrete mixer truck—Sound level (dBA) at 50 feet =	79	90	75.0
Source 2: Concrete mixer truck—Sound level (dBA) at 50 feet =	79	90	75.0
Source 3: Concrete pump truck—Sound level (dBA) at 50 feet =	81	80	74.0
Calculated Data			
	All Sources Combined—L_{max} sound level (dBA) at 50 feet =		85 L_{max}
	All Sources Combined—L_{eq} sound level (dBA) at 50 feet =		84 L_{eq}
Distance Between Source and Receiver (feet)	**Geometric Attenuation (dB)[a]**	**Calculated L_{max} Sound Level (dBA)[b]**	**Calculated L_{eq} Sound Level (dBA)[b]**
45[c]	**1**	**85**	**85**
50	0	85	84
100	-6	79	78
200	-12	73	72
300	-16	69	68
400	-18	66	66
450	-19	65	65
500	-20	65	64
600	-22	63	62

Notes:

[a] Geometric attenuation based on 6 dB per doubling of distance.

[b] This calculation does not include the effects, if any, of local shielding or ground attenuation from walls, topography, or other barriers that may reduce sound levels further.

[c] **Bolded** = results: Results at 45 feet are **bolded** because 45 feet is the approximate distance to the nearest existing land uses to project construction areas (701 Gateway Boulevard and 901 Gateway Boulevard).

In addition to the daytime construction activities proposed for the project that may begin prior to the 8:00 a.m. standard construction start time, approximately 15 instances of nighttime construction work would occur for concrete pours. Nighttime construction would begin approximately at 4:00 a.m. and be completed by 5:00 p.m. Between the hours of 4:00 a.m. and 7:00 a.m., construction noise must comply with the nighttime noise standard of 60 dBA. Between the hour of 7:00 a.m. and 8:00 a.m., construction noise must comply with the daytime noise standard of 65 dBA.

The loudest pieces of equipment required for a nighttime concrete pour would be two concrete mixer trucks and a concrete pump truck. Table 4.8-11 presents the potential noise levels during simultaneous operation the three loudest pieces equipment that would operate during nighttime concrete pours at various distances from the project site.

As shown in Table 4.8-11, noise levels from two concrete mixer trucks and a concrete pump truck are estimated to be approximately 85 dBA L_{eq} at a distance of 45 feet. Therefore, noise from concrete pour activities would exceed the City's 60 dBA nighttime noise standard at the nearest land use. There are no residential land uses near the project site. However, the nearest noise-sensitive land use where people typically sleep is the Larkspur Landing Hotel, which is located approximately 600 feet from areas where nighttime concrete pour activities could occur. At a distance of 600 feet, noise levels from two concrete mixer trucks and a concrete pump truck are estimated to be approximately 62 dBA L_{eq}. Although noise may be further attenuated at this distance from intervening features, or may be reduced if the concrete pour activities occur in the northern portion of the project site and at greater distances from this hotel, this estimated noise level exceeds the nighttime threshold of 60 dBA.

For these reasons, during the nighttime hours of 4:00 a.m. to 7:00 a.m. and during the daytime, but non-standard, hour of 7:00 a.m. to 8:00 a.m., noise from concrete pouring activities would potentially exceed the local standard, and impacts would be ***significant***. Therefore, Mitigation Measure NOI-1, Construction Noise Control Plan to Reduce Noise Outside of the Standard Construction Hours in the City of South San Francisco, which includes measures to reduce noise from construction activity during non-standard construction hours, would be implemented to reduce impacts from construction-related noise. Consequently, the impact from construction-generated noise that could occur during the 7:00 a.m. to 8:00 a.m. hour before standard construction noise hours begin and during the 15 occurrences of nighttime concrete pours (which would start at 4:00 a.m.) would be ***less than significant with mitigation***.

Mitigation Measure NOI-1: Construction Noise Control Plan to Reduce Noise Outside of the Standard Construction Hours in the City of South San Francisco

The project sponsor and/or the contractor(s) for the proposed project shall obtain a permit to complete work outside of the standard construction hours outlined in the City Municipal Code. In addition, the project sponsor and/or the contractor(s) for the proposed project shall develop a construction noise control plan to reduce noise levels to within the City's daytime and nighttime noise standards. Specifically, the plan shall demonstrate that noise from construction activities that occur daily between 7:00 and 8:00 a.m. weekdays and Saturday will comply with the applicable City noise limit of 65 dBA at the nearest existing land use, and construction activities that occur between 10:00 p.m. and 7:00 a.m. will comply with the applicable City noise limit of 60 dBA at the nearest existing land use. Measures to help reduce noise from construction activity during non-standard construction hours to these levels shall be incorporated into this plan and may include, but are not limited to, the following.

- Require all construction equipment be equipped with mufflers and sound control devices (e.g., intake silencers and noise shrouds) that are in good condition (at least as effective as those originally provided by the manufacturer) and appropriate for the equipment.
- Maintain all construction equipment to minimize noise emissions.
- Locate construction equipment as far as feasible from adjacent or nearby noise-sensitive receptors.
- Require all stationary equipment be located to maintain the greatest possible distance to the nearby existing buildings, where feasible.
- Require stationary noise sources associated with construction (e.g., generators and compressors) in proximity to noise-sensitive land uses to be muffled and/or enclosed within temporary enclosures and shielded by barriers, which can reduce construction noise by as much as 5 dB.
- Use noise-reducing enclosures around noise-generating equipment during nighttime/non-standard daytime hours. Prohibit the use of impact tools (e.g., jack hammers) during these hours.
- Prohibit idling of inactive construction equipment for prolonged periods during nighttime hours (i.e., more than 2 minutes).
- Advance notification shall be provided to surrounding land uses disclosing the construction schedule, including the various types of activities that would be occurring throughout the duration of the construction period.
- The construction contractor shall provide the name and telephone number of an on-site construction liaison. If construction noise is found to be intrusive to the community (complaints are received), the construction liaison shall investigate the source of the noise and require that reasonable measures be implemented to correct the problem.
- Use electric motors rather than gasoline- or diesel-powered engines to avoid noise associated with compressed air exhaust from pneumatically powered tools during nighttime hours. Where the use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust could be used; this muffler can lower noise levels from the exhaust by about 10 dB. External jackets on the tools themselves could be used, which could achieve a reduction of 5 dB.

Construction Haul Truck Noise

Haul trucks and material delivery trucks would be used to transport materials to and from the site during project construction. According to the project sponsor, the maximum number of trucks that would travel to and from the site in a given hour would be 22 trucks. This would occur during the concrete pours for the project. Note that this is a reasonable worst-case maximum, and for most construction activities, truck trips would be somewhat spread out throughout the day and there would be fewer per-hour trips than this number.

The City's Municipal Code does not include a specific threshold that pertains to construction haul truck noise. However, and as discussed above, a change of 3 dB is considered barely noticeable by the human ear. Therefore, anticipated loudest-hour haul truck noise was assessed to determine if a 3 dB increase over ambient noise levels would occur.

The City has published general truck routes in the City,[13] but the routes of trucks during project construction is not known with certainty at this time. Based on the City's general truck routes, the closest access to the U.S. 101 is located northeast of the project site. It is likely that trucks would travel to the project site via U.S. 101, then travel east on Oyster Point Boulevard after exiting the freeway, and turning south on Gateway Boulevard to access the project site. Along this route, there are only commercial and office land uses, which are not typically considered sensitive to noise. Noise in these areas is already somewhat elevated from the nearby U.S. 101 freeway and other local roadways, as well.

Existing worst-hour traffic noise modeling was conducted to estimate the peak-hour L_{eq} noise level along these two segments. Existing traffic noise from vehicles traveling on Oyster Point Boulevard east of Dubuque Avenue was modeled to be approximately 70.3 dBA L_{eq} during the peak hour, and traffic noise from vehicles traveling along Gateway Boulevard south of Oyster Point was modeled to be 66.6 dBA L_{eq} during the worst-case peak hour. The addition of 22 trucks to these two segments would increase noise to approximately 70.7 and 67.4 dBA L_{eq} respectively, which equates to an approximately 0.4 and 0.9 dB increase along these segments.

A less than 3 dB increase in noise would occur (with a change of 3 dB considered barely noticeable); thus, temporary noise increases from project haul and materials delivery trucks in the project vicinity would be ***less than significant.***

Traffic Noise

As discussed in Section 4.9, *Transportation and Circulation*, of this draft EIR, implementation of the proposed project would lead to an increase in traffic in the vicinity of the project site. Quantitative modeling of traffic noise increases resulting from project implementation was conducted using a spreadsheet that is based on the FHWA TNM version 2.5.

As shown in Table 4.8-12, project-related noise increases on roadway segments in the project vicinity range from 0 to 0.5 dB. Project-related traffic noise would not result in a 5 dBA or greater increase in areas where future noise level are within the normally acceptable range, and would not result in a 3 dBA or greater increase in areas where future noise level are above the normally acceptable range. Thus, project-related traffic noise impacts would be ***less than significant***.

Heating, Ventilation, and Air Conditioning, and Mechanical Equipment Noise

The proposed heating, ventilation, and air conditioning (HVAC) systems and mechanical equipment for the proposed project would include two chillers and three boilers to serve the heating and cooling needs in the building, which would be located in a rooftop penthouse. Nine pumps would also be located in the penthouse. Four air-handling units, two cooling towers and six large exhaust fans would also be located on the roof behind a screen.

Noise generated by equipment located in the mechanical equipment room or the rooftop penthouse would be attenuated somewhat by the walls of the equipment room. A reasonably conservative assumption of 10 dB of reduction was applied to all equipment located inside the equipment room. The rooftop screen may not be as tall as the height of the equipment and there would be a gap at the

[13] City of South San Francisco. 2020. *Truck Routes.* Available: https://www.google.com/maps/d/viewer?mid=1ePU1NiJj2omRVWwagk4bBUKU9t58-Y0K&ll=37.649158157197135%2C-122.40959426201982&z=14. Accessed: July 28, 2020.

Table 4.8-12. Modeled Traffic Noise Impacts on Existing Land Uses

Roadway	Segment	Existing No Project (dB L_{dn})	Existing Plus Project (dB L_{dn})	Project-related Increase[a] (dB)
Airport Boulevard	North of Sister Cities Boulevard	65.4	65.4	0.0
Airport Boulevard	South of Sister Cities Boulevard	64.1	64.1	0.0
Airport Boulevard	North of Grand Avenue	65.3	65.3	0.0
Airport Boulevard	South of Grand Avenue	65.5	65.5	0.0
Sister Cities Boulevard	East of Airport Boulevard	69.3	69.3	0.0
Sister Cities Boulevard	West of Airport Boulevard	68.8	68.8	0.0
Oyster Point Boulevard	East of Dubuque Avenue	66.2	66.2	0.0
Oyster Point Boulevard	West of Dubuque Avenue	69.1	69.1	0.0
Oyster Point Boulevard	East of Gateway Boulevard	69.0	69.0	0.0
Oyster Point Boulevard	West of Gateway Boulevard	69.9	70.0	0.2
Gateway Boulevard	South of Oyster Point Boulevard	66.0	66.5	0.5
Gateway Boulevard	North of East Grand Avenue	65.2	65.5	0.3
Gateway Boulevard	South of East Grand Avenue	65.3	65.5	0.1
East Grand Avenue	East of Gateway Boulevard	68.8	68.8	0.0
East Grand Avenue	West of Gateway Boulevard	68.1	68.2	0.1
Grand Avenue	East of Airport Boulevard	67.1	67.2	0.1
Grand Avenue	West of Airport Boulevard	64.5	64.6	0.1
Dubuque Avenue	South of Oyster Point Boulevard	67.9	68.0	0.1
Dubuque Avenue	South of U.S. 101 Ramps	61.6	61.7	0.0

Source: Traffic volumes provided by Fehr & Peers. Modeling conducted using a spreadsheet based on the FHWA TNM version 2.5 at a fixed distance of 50 feet from the roadway centerline.

Notes:

[a] Existing plus project values minus existing no project values.

bottom of the screen to allow for exhaust and ventilation. Noise from equipment located behind the rooftop screen may be reduced slightly by the screen; however, noise is not typically substantially reduced unless a screen is solid with no gaps or openings and is at least as tall as the equipment. Therefore, although some attenuation may be achieved from the rooftop screen, no noise attenuation is assumed in this analysis for noise sources located on the roof behind the rooftop equipment screen.

According to the project sponsor, custom air handling units, such as the four air handlers proposed for the project, can produce sound levels in the range of about 65 to 70 dBA at 50 feet, depending on the size of the unit. The proposed cooling towers would generate a noise level of approximately 78 dBA at 50 feet. The heat recovery chillers would generate a noise level of 65 dBA at 50 feet without accounting for any attenuation, a typical boiler generates a sound power level in the range of 96 to 99 dBA,[14] which equates to a noise level of 64 to 67 dBA at 50 feet.

[14] Hoover and Keith. 2000. *Noise Control for Buildings, Manufacturing Plants, Equipment, and Products*. Houston, TX.

Pumps can generate noise levels at 50 feet of approximately 81 dBA, and the types of exhaust/ventilation fans proposed for the project can generate noise levels at 50 feet of approximately 77 dBA, according to the project sponsor. Based on these source noise levels, combined noise from three boilers, two chillers, and nine pumps located in a mechanical penthouse and two cooling towers, four air handling units, and six exhaust fans located behind a mechanical equipment screen at a distance of 50 feet could be up to approximately 88dBA, conservatively assuming all equipment was operational simultaneously and relatively close to one another.

The nearest existing land use to the proposed building is 701 Gateway Boulevard. The proposed building would be located approximately 100 feet from 701 Gateway Boulevard. Based on the source noise levels and operational assumptions described above, noise from the HVAC system and equipment at a distance of 100 feet is conservatively estimated to be approximately 84 dBA. The next closest land use, 901 Gateway boulevard, is located approximately 160 feet from the proposed building. Noise from the rooftop equipment at a distance of 160 feet would be approximately 80 dBA. As described previously, all land uses within the GSPD are governed by the same municipal code noise thresholds of 65 dBA during the daytime hours of 7:00 a.m. to 10:00 p.m. and 60 dBA during the nighttime hours of 10:00 p.m. to 7:00 a.m. with respect to noise generated by stationary sources. Thus, the proposed rooftop HVAC system and equipment noise may exceed the daytime and nighttime thresholds outlined in the South San Francisco Municipal Code and impacts from mechanical equipment noise would be ***significant***. Therefore, Mitigation Measure NOI-2, Operational Noise Study to Determine Attenuation Measures to Reduce Noise from Project Mechanical Equipment, would ensure the project's mechanical equipment is selected and located to comply with the City's Noise Ordinance. Consequently, the noise impact from the mechanical equipment would be ***less than significant with mitigation***.

Mitigation Measure NOI-2: Operational Noise Study to Determine Attenuation Measures to Reduce Noise from Project Mechanical Equipment

Once equipment models and design features to attenuate noise have been selected, the project sponsor shall conduct a noise analysis to estimate actual noise levels of project-specific mechanical equipment, including heating and cooling equipment (such as boilers, chillers, cooling towers, and exhaust fans), to reduce potential noise impacts resulting from project mechanical equipment. Feasible methods to reduce noise below the significance threshold include, but are not limited to, selecting quieter equipment, siting equipment further from the roofline, and/or enclosing all equipment in a mechanical equipment room designed to reduce noise. This analysis shall be conducted, and its results and reduction methods provided to the City, prior to the issuance of building permits.

The analysis shall be prepared by persons qualified in acoustical analysis and/or engineering and shall demonstrate with reasonable certainty that the mechanical equipment selected for the project and the attenuation features incorporated into project design would ensure noise from these equipment do not result in noise at the nearest existing land use of 65 dBA L_{eq} during the daytime and 60 dBA L_{eq} during the nighttime. The project sponsor shall incorporate all recommendations from the acoustical analysis necessary to ensure that noise sources would meet applicable requirements of the noise ordinance into the building design and operations.

Emergency Generator Noise

The project proposes the installation of one diesel 1,250-kilowatt (kW) emergency generator in the project loading and service yard. The generator would be equipped with a level 3 enclosure, which would reduce noise levels somewhat from generator operations. Periodic testing of the generator would be completed; testing is anticipated to consist of one test per week for 30 to 45 minutes per test at a load of 100 percent for up to 50 hours per year maximum. Other than testing, the generator would only operate during emergencies. Typically, generator noise during emergencies is exempt from local noise standards. During testing, generator noise must comply with the local standards.

Section 8.32.030 of the City's Noise Ordinance specifies maximum permissible sound levels to be generated by any property within the City. The maximum allowable level is determined by the land use category of the receiving property and is measured on any receiving property. In the GSPD, noise generated during daytime hours is limited to 65 dBA and noise generated during nighttime hours is limited to 60 dBA at nearby receptors.

Operation of the proposed generator equipped with a level 3 enclosure could result in noise levels of 75 dBA at a distance of 7 meters, or approximately 23 feet. The nearest existing building to the proposed service yard, which is where the generator would be located, is the building at 701 Gateway, approximately 150 feet from the proposed generator location within the service yard. At a distance of 150 feet, noise from generator testing would be reduced to 59 dBA L_{eq}. Noise from generator testing at other nearby buildings would be even lower because they are all located farther than 150 feet from the proposed generator location. Noise from generator testing would not result in noise levels of greater than the 65 dBA daytime and 60 dBA nighttime thresholds at the nearest receptors; thus, noise impacts from generator testing would be ***less than significant***.

Impact NOI-2: The proposed project would not generate excessive ground-borne vibration or ground-borne noise levels. (*Less than Significant*)

Damage to Structures

Construction of the proposed project would require equipment that could generate ground-borne vibration; however, most of the proposed equipment types generate relatively low vibration levels. Typical vibration levels associated with heavy-duty construction equipment at a reference distance of 50 feet are shown in Table 4.8-13. No pile drivers or hoe rams are proposed for project construction. The proposed pieces of equipment for project construction with the greatest potential to generate vibration are ground-disturbing equipment such as an excavator and a Gradall. These pieces of equipment typically generate vibration levels similar to that of a large bulldozer. A large bulldozer would generate vibration levels of approximately 0.037 PPV inches per second at a distance of 45 feet.

The existing structures located within and adjacent to the project site appear to be relatively modern and are not expected to be particularly susceptible to vibration-related damage. The nearest existing structures to project construction activities are the buildings at 701 Gateway Boulevard and 901 Gateway Boulevard; both buildings are located approximately 45 feet from the nearest project construction areas. These structures would likely be categorized as a modern industrial/commercial building, according to the Caltrans vibration damage criteria shown in Table 4.8-4. These types of buildings have a vibration threshold for continuous or frequent/intermittent vibration sources (such as construction) of 0.5 PPV inches per second.

Therefore, a large bulldozer would generate vibration over ten times below this level at a distance of 45 feet and potential vibration-related damage impacts from project construction would be ***less than significant.***

Annoyance-related Vibration Impacts

Regarding annoyance-related vibration impacts, a significant vibration impact related to sleep disturbance could occur when nighttime construction activities generate vibration levels that are strongly perceptible at locations where people sleep for a prolonged period of time. There are no residential land uses near the project site, so sleep-disturbance related vibration impacts would not occur. The nearest residential land uses are located over 1,200 feet from the project site, the nearest hotel (Larkspur Landing) is located approximately 600 feet from the main project construction areas, and 300 feet from the southern portion of the project site where paving, curb work and landscaping activities may occur. The nearest childcare use (Gateway Child Development Center Peninsula) is located approximately 670 feet from the nearest project construction area (the southern portion of the site where paving and landscaping work is proposed). Sleep disturbances from vibration only occur if residences are located very close to ground-disturbing construction activities that occur at night. For example, vibration levels may exceed Caltrans Vibration Annoyance Criteria's distinctly perceptible level of 0.04 PPV inches per second within 50 feet of an operating auger drill or large bulldozer, or the strongly perceptible criteria of 0.1 PPV inches per second at 25 feet for this equipment. Construction activity involving these types of equipment is not proposed for nighttime hours, and residences are located much farther than these distances from project construction areas. However, it is possible that construction vibration during daytime hours could result in disturbances to nearby office or research-related buildings. If vibration levels are in excess of the Caltrans Vibration Annoyance Criteria's distinctly perceptible level of 0.04 PPV inches per second, annoyance-related impacts could be significant.

The nearest existing structures to project construction activities are the buildings at 701 Gateway Boulevard and 901 Gateway Boulevard; both buildings are located approximately 45 feet from the nearest project construction areas. To provide a conservative assumption, vibration levels at a distance of 45 feet from construction activity were modeled to assess potential annoyance-related vibration impacts. As described above, the pieces of construction equipment likely to generate the most vibration are an excavator and a Gradall. These would generate vibration levels similar to that of a large bulldozer. At a distance of 45 feet, a large bulldozer would generate a vibration level of approximately 0.037 PPV inches per second. This is below the Caltrans vibration annoyance criteria's distinctly perceptible level of 0.04 PPV inches per second. In addition, the construction equipment would usually operate farther than 45 feet from the nearby occupied buildings. Therefore, annoyance-related vibration impacts would be ***less than significant.***

Impact NOI-3: The proposed project would not expose people residing or working in the project area to excessive noise levels for a project located within the vicinity of a private airstrip or an airport land use plan or, were such a plan has not been adopted, within two miles of a public airport or public use airport. (*No Impact*)

SFO is approximately 2 miles south of the project site. According to the 2012 SFO ALUCP, the project site is not located within the CNEL 65 decibel noise contour.[15] In addition, there are no private airstrips within the vicinity of the project site. For these reasons, there would be ***no impact*** related to aircraft activity noise from public airports and private airstrips.

[15] Exhibit IV-5, *Noise Compatibility Zones* in the 2012 SFO ALUCP.

4.8.4.4 Cumulative Impacts

Impact C-NOI-1: The proposed project would not result in a cumulatively considerable contribution to the generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project site in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies. *(Less than Significant with Mitigation)*

The cumulative geographic context for noise and vibration varies, depending on the source of the noise or vibration. Specifically, the geographic context for cumulative construction noise impacts typically encompasses cumulative projects within no more than 1,000 feet of the project site. Beyond 1,000 feet, the contributions of noise from the construction of other projects would be greatly attenuated through both distance and intervening structures, and their contribution would be expected to be minimal. The cumulative context for stationary-source noise impacts, such as noise effects from HVAC or other mechanical equipment, and for vibration effects from construction activities is generally smaller than this distance (a few hundred feet at most). Finally, cumulative impacts related to vehicular traffic noise are based on overall forecast average daily traffic along roadway segments near the project site, which includes traffic increases from all growth within the project area, as predicted in the traffic model. The cumulative projects within 0.5 mile of the project site are described in Section 4.1.5, *Approach to Cumulative Impact Analysis*, of this draft EIR and shown in Figure 4.1-1.

Construction Noise

Construction noise is a localized impact that reduces as distance from the noise source increases. In addition, intervening features (e.g., buildings) between construction areas and nearby noise-sensitive land uses result in additional noise attenuation by providing barriers that break the line of sight between noise-generating equipment and sensitive receptors. These barriers can block sound wave propagation and somewhat reduce noise at a given receiver.

The only cumulative project located with 1,000 feet of the proposed project is 475 Eccles Avenue (Cumulative Project No. 16). The project was entitled in August of 2016. However, at this time, it is unknown when construction will begin. Construction activities for the project could coincide with construction activities for the 475 Eccles Avenue Project. The project site is located approximately 630 feet from the closest edge of the project site for the 475 Eccles Avenue Project. At this distance, construction noise would diminish substantially. For example, as shown in Table 4.8-10, worst-case project construction noise at a distance of 600 feet from the loudest proposed project construction activities would be approximately 64 dBA L_{eq}. This noise level is typical of an urban area, such as the area where these two projects would be located.

Project construction would also occur mostly during the standard daytime hours for construction, as defined by the South San Francisco Municipal Code. During these hours, construction noise restrictions are less stringent, and nearby receptors are considered to be less sensitive to noise. In addition, there are no residences or land uses that are typically considered noise-sensitive located between the project site and the 475 Eccles Avenue Project. Furthermore, numerous buildings are located between the two sites, which would provide shielding and further attenuate noise from construction activities and would reduce the likelihood of construction noise from these two projects combining. Thus, it is unlikely that construction activities from these two projects would combine to expose the same receptors to excessive construction noise. For these reasons, the proposed project, in combination with other past, present, and reasonably foreseeable future projects, would not result in a significant cumulative noise impact during construction. The cumulative impact would be ***less than significant***. No mitigation is required.

Operational Noise

Traffic Noise

To determine the potential cumulative noise impacts in the project area, traffic volumes from the existing scenario were compared to the 2040 with-project scenario. If a cumulative traffic noise impact is anticipated along a given roadway segment (i.e., a 3 dB in increase between existing and cumulative no project conditions), then the proposed project's contribution to that impact must be assessed. If the project would contribute 3 dB to the overall increase, the project's cumulatively considerable contribution to the cumulative impact would be significant.

Table 4.8-13 shows cumulative traffic noise increases and includes an analysis of potential impacts along roadway segments near the project site. There were no segments identified where a 5 dB increase in noise would occur in areas where future noise levels would below the acceptable range. However, as shown in Table 4.8-13, significant cumulative impacts in areas where future noise levels are above the acceptable range (e.g., a 3 dB increase from existing to cumulative plus project conditions) were modeled to occur along seven modeled roadway segments. The cumulative impact would be ***significant***. However, the proposed project's incremental increase to these potential cumulative impacts would be between 0 and 0.2 dB. Therefore, the proposed project's contribution to the cumulative impact would be ***less than cumulatively considerable.***

HVAC Noise

In general, most operational sources of noise do not generate noise that is perceptible far beyond the edge of a project site. HVAC noise from the proposed project would be localized and would attenuate rapidly with distance. The nearest cumulative project, the project at 475 Eccles Avenue (Cumulative Project 16), is located approximately 630 feet east of the project site. There are no residences or land uses that are typically considered noise-sensitive located between the two projects. However, the applicable noise thresholds for all land uses in the GSPD are the same regardless of the type of use (i.e., 60 dBA during nighttime hours and 65 dBA during daytime hours). As described under Impact NOI-1, unattenuated noise from rooftop heating and cooling equipment could result in excessive noise levels in the project vicinity with an estimated combined noise level of 90 dBA at a distance of 50 feet from the proposed equipment. The approximate halfway distance between the two project sites is approximately 315 feet. An existing occupied office structure is at this location. At a distance of 315 feet, unattenuated HVAC noise from the project site would be in the range of approximately 74 dBA. Assuming the cumulative project at 475 Eccles Avenue uses similar heating and cooling equipment, noise from the cumulative project could also elevate ambient noise levels at this common receptor. Should both projects expose a single receptor to the same noise levels from heating and cooling equipment, the overall combined noise level would be approximately 3 dB higher than the HVAC noise from a single project. Although it is not easily perceptible, a 3 dB increase in noise is considered to be barely perceptible by the average healthy human ear. A perceptible increase in noise at a common receptor could occur if both projects had unattenuated HVAC noise; thus, the cumulative noise impact from HVAC equipment would be ***significant***. With implementation of Mitigation Measure NOI-2, Operational Noise Study to Determine Attenuation Measures to

Reduce Noise from Project Mechanical Equipment, project-related impacts would be reduced to less-than-significant levels, and the contribution of the project to the potential cumulative impact would be ***less than cumulatively considerable with mitigation.***

Emergency Generator Noise

The nearest cumulative project, the project at 475 Eccles Avenue (Cumulative Project No. 16), is located approximately 630 feet east of the project site. There are no residences or land uses that are typically considered noise-sensitive located between the two projects. As discussed under Impact NOI-1, noise from the testing of the emergency generator would not be expected to exceed the daytime or nighttime noise thresholds in the City at a distance of 150 feet (noise from project generator testing was estimated to be up to 59 dBA L_{eq} at this distance). Assuming the cumulative project at 475 Eccles Avenue includes an emergency generator, noise from the cumulative project could also elevate ambient noise levels at this common receptor. However, emergency generator testing typically occurs very intermittently (e.g., up to once per week for a period of 30 to 45 minutes for the proposed project) and, thus, it is unlikely that testing of the emergency generator for the proposed project would occur concurrently with the generator testing at 475 Eccles Avenue. Even if testing were to occur simultaneously, the distance between the two generators would be great enough ensure that noise levels would not combine to expose a given individual receptor to increased cumulative noise from generator testing. Thus, the cumulative noise impact related to emergency generator testing would be ***less than significant***.

Impact C-NOI-2: The proposed project, in combination with past, present, and reasonably foreseeable future projects, would not expose persons to or generate excessive ground-borne vibration or ground-borne noise levels. *(Less than Significant)*

Vibration impacts are based on instantaneous PPV levels. Thus, since impacts only consider the peak vibration levels, worst-case ground-borne vibration levels from construction are generally determined by whichever individual piece of equipment generates the highest peak vibration level. Unlike the analysis for average noise levels, in which noise levels of multiple pieces of equipment can be combined to generate a maximum combined noise level, instantaneous peak vibration levels do not combine in this way. Vibration from multiple construction sites, even if they are close to one another, would not be expected to combine to raise the maximum PPV level. For this reason, the cumulative impact of construction vibration from multiple construction projects near one another (or even adjacent to one another) would generally not combine to increase PPV vibration levels. Thus, the cumulative geographic context for vibration is highly localized. The cumulative projects within 0.5 mile of the project site are described in Section 4.1.5, *Approach to Cumulative Impact Analysis*, of this draft EIR and shown in Figure 4.1-1. The nearest cumulative project, the project at 475 Eccles Avenue (Cumulative Project No. 16), is located approximately 630 feet east of the project site. At this distance, peak vibration levels resulting from construction of the project would not be expected to combine with vibration effects from the construction of the 475 Eccles Avenue Project if they were to be under construction simultaneously. Therefore, cumulative ground-borne vibration impacts related to both potential damage and annoyance would be ***less than significant***.

Table 4.8-13. Modeled Cumulative Traffic Noise Impacts

Roadway	Segment	Existing No Project (dB Ldn)	Cumulative No Project (dB Ldn)	Cumulative Plus Project (dB Ldn)	Cumulative Plus Project Minus Existing (dB)	Potential Cumulative Impact?	Cumulative Plus Project Minus Cumulative No Project (dB)	Cumulatively Considerable Increase?
Airport Boulevard	North of Sister Cities Boulevard	65.4	67.0	67.0	1.6	No	0.0	N/A
Airport Boulevard	South of Sister Cities Boulevard	64.1	65.2	65.2	1.1	No	0.0	N/A
Airport Boulevard	North of Grand Avenue	65.3	68.0	68.0	2.7	No	0.0	N/A
Airport Boulevard	South of Grand Avenue	65.5	67.2	67.3	1.8	No	0.0	N/A
Sister Cities Boulevard	East of Airport Boulevard	69.3	71.0	71.1	1.7	No	0.0	N/A
Sister Cities Boulevard	West of Airport Boulevard	68.8	69.4	69.4	0.6	No	0.0	N/A
Oyster Point Boulevard	East of Dubuque Avenue	66.2	67.3	67.3	1.1	No	0.0	N/A
Oyster Point Boulevard	West of Dubuque Avenue	69.1	70.8	70.8	1.7	No	0.0	N/A
Oyster Point Boulevard	East of Gateway Boulevard	69.0	72.4	72.4	3.4	**Yes**	0.0	No
Oyster Point Boulevard	West of Gateway Boulevard	69.9	73.0	73.0	3.2	**Yes**	0.1	No
Gateway Boulevard	South of Oyster Point Boulevard	66.0	69.4	69.6	3.6	**Yes**	0.2	No
Gateway Boulevard	North of East Grand Avenue	65.2	67.6	67.7	2.5	No	0.1	N/A
Gateway Boulevard	South of East Grand Avenue	65.3	69.3	69.3	4.0	**Yes**	0.1	No
East Grand Avenue	East of Gateway Boulevard	68.8	72.0	72.0	3.2	**Yes**	0.0	No
East Grand Avenue	West of Gateway Boulevard	68.1	71.5	71.5	3.3	**Yes**	0.0	No
Grand Avenue	East of Airport Boulevard	67.1	71.2	71.2	4.1	**Yes**	0.0	No
Grand Avenue	West of Airport Boulevard	64.5	66.1	66.2	1.7	No	0.0	N/A
Dubuque Avenue	South of Oyster Point Boulevard	67.9	69.6	69.7	1.8	No	0.1	N/A
Dubuque Avenue	South of U.S. 101 Ramps	61.6	61.8	61.8	0.2	No	0.0	N/A

Note: N/A indicates that there would be no potential cumulative impact and, thus, no cumulatively considerable increase attributable to the proposed project.

[page left blank intentionally]

4.9 Transportation and Circulation

4.9.1 Introduction

This section describes the environmental and regulatory setting for transportation and circulation. It also describes impacts associated with transportation and circulation that would result from implementation of the proposed project and mitigation for significant impacts where feasible and appropriate.

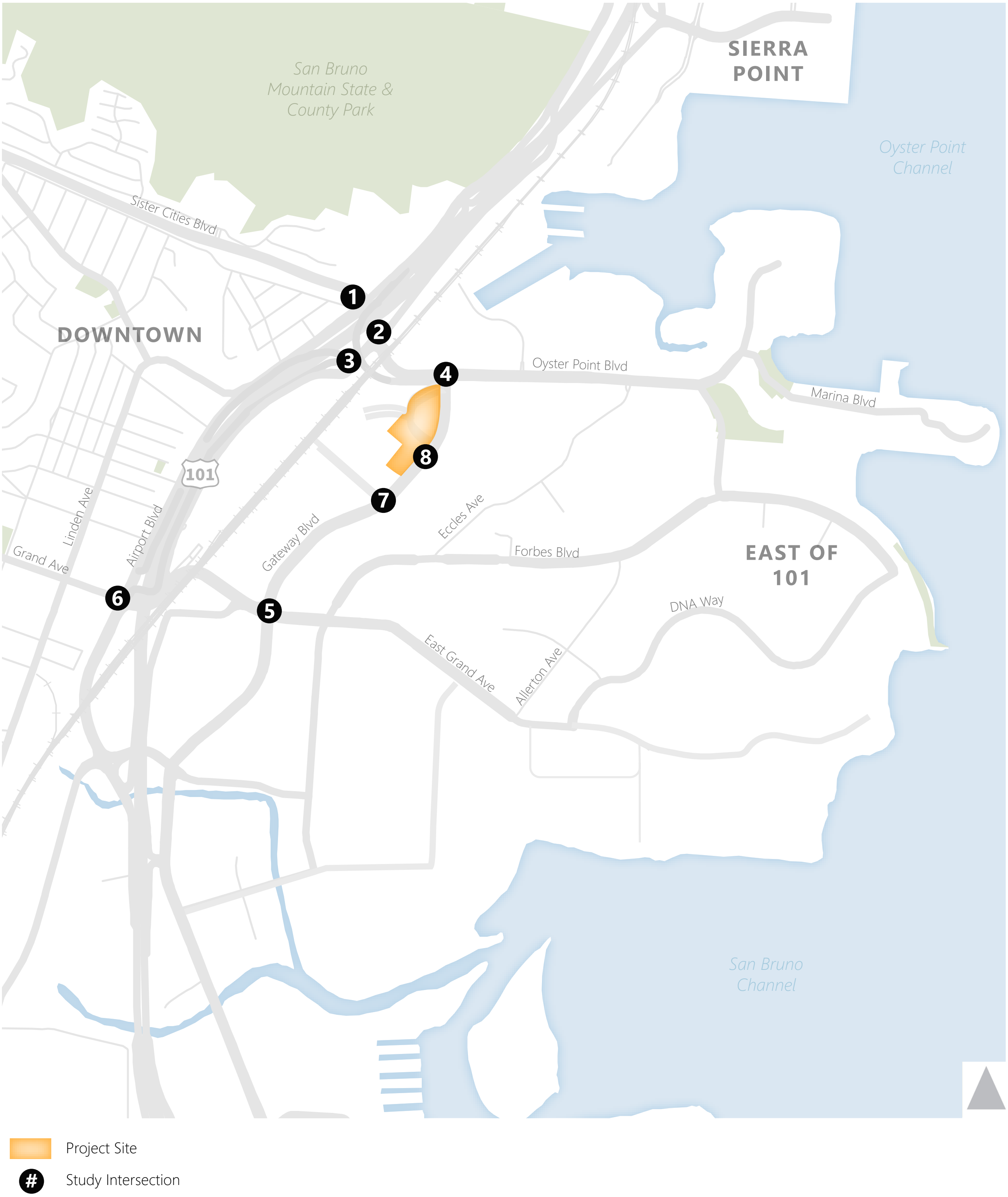
The *Transportation Impact Analysis* (TIA) is provided in Appendix D of this draft environmental impact report (EIR).

4.9.2 Environmental Setting

4.9.2.1 Roadway Facilities

The project site is at the southwest corner of the Oyster Point Boulevard and Gateway Boulevard intersection in the City of South San Francisco's (City's) East of 101 employment area. Regional access to the project site is provided via U.S. Route 101 (U.S. 101) and Oyster Point Boulevard to the north and U.S. 101 and East Grand Avenue to the south. Relevant roadway plans and policies (i.e., the *South San Francisco General Plan*, the *Mobility 20/20 Plan*, and the Complete Streets Policy) are discussed in Appendix D. Figure 4.9-1 shows the project location, study intersections, and the surrounding roadway system. Project site vehicular access is provided via two two-way driveways that intersect Gateway Boulevard south of Oyster Point Boulevard. A dedicated pedestrian walkway parallels the driveway. Study intersections are listed below.

- Gateway Boulevard/Gateway Business Park Driveway
- Airport Boulevard/Grand Avenue
- Gateway Boulevard/East Grand Avenue
- Gateway Boulevard/Corporate Driveway
- Dubuque Avenue/Oyster Point Boulevard
- Gateway Boulevard/Oyster Point Boulevard
- Airport Boulevard/Sister Cities Boulevard
- Dubuque Avenue/U.S. 101 Off-ramp



Source: Fehr & Peers, 2020.

ICF Graphics ... 00662.19 (8-3-2020) JC

ICF

Figure 4.9-1
Project Location and Study Intersections
751 Gateway Boulevard Project

Key local roadways in the vicinity of the project site are described below.

- U.S. 101 is an eight-lane freeway and principal north-south roadway connection between San Francisco, San José, and intermediate San Francisco Peninsula cities. In South San Francisco, U.S. 101 is located approximately 1 mile west of the project site and serves the East of 101 area with three primary access points. Near the project site, U.S. 101 carries about 220,000 vehicles per day and defines the East of 101 area's western edge and barrier to east-west bicycle and pedestrian connectivity. Access points are listed below.
  - **Southern Access—Gateway Boulevard:** Northbound on- and off-ramps are at South Airport Boulevard/Wondercolor Lane; southbound on- and off-ramps are immediately south of the San Mateo Avenue/Produce Avenue/South Airport Boulevard intersection.
  - **Central Access—East Grand Avenue:** Northbound off-ramps are at East Grand Avenue/Poletti Way and on-ramps are to the west at Grand Avenue/Airport Boulevard. Southbound off-ramps are at Airport Boulevard/Miller Avenue. There is no southbound freeway access at this location.
  - **Northern Access—Oyster Point Boulevard:** Northbound on- and off-ramps intersect Dubuque Avenue at and immediately south of Oyster Point Boulevard. Southbound on-ramps are at Dubuque Avenue, adjacent to the northbound off-ramp. The southbound off-ramp intersects Gateway Boulevard/Oyster Point Boulevard as the intersection's fifth leg.
- East Grand Avenue is an east-west arterial street. It has six travel lanes west of Gateway Boulevard, four travel lanes east of Gateway Boulevard, and two travel lanes east of Haskins Way. U.S. 101 freeway ramps at East Grand Avenue enable project site access from the south. East Grand Avenue carries about 17,000 vehicles per day.
- Airport Boulevard runs roughly parallel to U.S. 101 in South San Francisco. Freeway ramps south of Grand Avenue provide alternate project site access from the south. Airport Boulevard carries approximately 24,000 vehicles per day.
- Gateway Boulevard is a four-lane north-south arterial connecting East Grand Avenue with South Airport Boulevard and Oyster Point Boulevard. Class II bicycle lanes exist between East Grand Avenue and South Airport Boulevard. The corridor provides project site access from the north via U.S. 101 ramps at Oyster Point Boulevard. Gateway Boulevard carries approximately 12,000 vehicles per day.

4.9.2.2 Transit Facilities and Service

The project site is not served directly by regional rail, ferry, or bus transit services; however, regional rail service (via Caltrain), ferry service (via Water Emergency Transportation Authority [WETA]), and bus service (via San Mateo County Transit District [SamTrans]) is within walking distance of the project site. The San Bruno Bay Area Rapid Transit (BART) station is approximately 2 miles from the project site, the South San Francisco Caltrain station is approximately 0.75 mile from the project site, and the WETA ferry terminal is approximately 1 mile from the project site. No SamTrans bus service currently exists east of U.S. 101 in South San Francisco. The project site therefore relies on supplementary public shuttle services to connect employees with regional transit. Relevant transit plans and policies (i.e., the *South San Francisco General Plan*, the *East of 101 Mobility 20/20 Plan*, and the *Caltrain Business Plan*) are discussed in Appendix D. Existing transit services are shown in Figure 4.9-2.

Source: Fehr & Peers, 2020.

ICF Graphics ... 00662.19 (8-3-2020) JC

ICF

Figure 4.9-2
Existing Transit Facilities
751 Gateway Boulevard Project

4.9.2.3 Regional Transit Service

The following transit services operate within South San Francisco and are accessible from the project site using a bicycle or first- and last-mile shuttle connection provided by the Peninsula Traffic Congestion Relief Alliance (Commute.org).

- BART provides regional rail service between the East Bay, San Francisco, and San Mateo County, connecting between San Francisco International Airport and Millbrae Intermodal Station to the south, San Francisco to the north, and Oakland, Richmond, Pittsburgh/Bay Point, Dublin/Pleasanton and Fremont in the East Bay. The South San Francisco Station is located approximately 3 miles west of the project site at Mission Road and McLellan Drive. The San Bruno Station is located approximately 2 miles southwest of the project site near The Shops at Tanforan. BART trains operate on 15-minute headways during peak hours, and 20-minute headways during off-peak hours.
- Caltrain provides passenger rail service on the Peninsula between San Francisco and San José, and limited service trains to Morgan Hill and Gilroy during weekday commute periods. The South San Francisco Caltrain station is currently located approximately 0.75 mile south of the project site at 590 Dubuque Avenue, on the east side of U.S. 101, immediately north of East Grand Avenue. By 2020, Caltrain plans to relocate the South San Francisco Caltrain station several hundred feet to the south near the East Grand Avenue/Airport Boulevard intersection, and provide more direct pedestrian access to the East of 101 area via a tunnel with access at East Grand Avenue and Poletti Way. The South San Francisco Caltrain Station serves local and limited trains, with 23 northbound and 23 southbound weekday trains. The South San Francisco Caltrain Station provides weekday service from 5:40 a.m. to 12:00 a.m., with approximately 30-minute headways during peak times and 60-minute headways during off-peak times.
- WETA provides weekday commuter ferry service between the Oakland/Alameda ferry terminals and the South San Francisco Ferry Terminal at Oyster Point. There are three morning departures from Oakland/Alameda to South San Francisco, and three evening departures from South San Francisco to Oakland/Alameda. The South San Francisco Ferry terminal is located approximately 1 mile from the project site.
- SamTrans provides bus and rail service (through Caltrain) in San Mateo County but does not serve the East of 101 employment area. The closest bus stops to the project site are approximately 0.6 mile to the northwest near the intersection of Airport Boulevard and Sister Cities Boulevard and are served by Routes 292 and 397.

East of 101 Commuter Shuttle Service

Commute.org shuttles provide weekday commute period first/last mile connections between BART and Caltrain stations and the WETA ferry terminal and local employers in the East of 101 area, including the project site. Six weekday peak period peak-direction routes serve the East of 101 area. Service is roughly distributed between the East of 101 area's north (i.e., the Oyster Point area) and south (i.e., the Utah/Grand area) geographic halves. Project shuttle access is provided by an existing stop 0.2 mile away at the intersection of Oyster Point and Gateway Boulevards, which is served by all Oyster Point area shuttles. These routes connect with Caltrain, BART, and the WETA ferry terminal.

4.9.2.4 Pedestrian Facilities

Pedestrian facilities include sidewalks, crosswalks, trails, and pedestrian signals. In the project vicinity, continuous sidewalks exist along both sides of Gateway Boulevard except south of Larkspur Landing driveway, where continuous sidewalks exist on the east side of the roadway for intermittent sections to East Grand Avenue.

At the intersection of Oyster Point Boulevard and Gateway Boulevard (a signal-controlled intersection immediately adjacent to the project site), marked crosswalks are provided on two of the four intersection legs. Sidewalks exist on the north side of Oyster Point Boulevard, which provides continuous pedestrian connectivity between the project site and the nearest existing Commute.org shuttle stop.

A segment of the San Francisco Bay Trail (Bay Trail) runs along the shoreline in the East of 101 area, providing a continuous off-street shared-use trail connection between Brisbane's Sierra Point to the north and South Airport Boulevard at the San Bruno Canal to the south. The Bay Trail is a public pedestrian and bicycle trail that is planned to extend around the entire San Francisco Bay. To the north of the project site, the Bay Trail connects to the South San Francisco ferry terminal to Oyster Point Boulevard, allowing bicyclists and pedestrians to access the ferry terminal. Currently, there are gaps in the trail to the north of Brisbane, and just south of South San Francisco.

Relevant pedestrian plans and policies (i.e., the *South San Francisco General Plan*, the *Mobility 20/20 Plan*, and the *South San Francisco Pedestrian Master Plan*) are discussed in Appendix D.

4.9.2.5 Bicycle Facilities

Bicycle facilities consist of separated bikeways, bicycle lanes, routes, trails, and paths, as well as bicycle parking, bicycle lockers, and showers for cyclists. The California Department of Transportation (Caltrans) recognizes four classifications of bicycle facilities as described below.

- **Class I—Shared-Use Pathway:** Provides a completely separated right-of-way for the exclusive use of cyclists and pedestrians with crossflow minimized (e.g., off-street bicycle paths).
- **Class II—Bicycle Lanes:** Provides a striped lane for one-way travel on a street or highway. May include a "buffer" zone consisting of a striped portion of roadway between the bicycle lane and the nearest vehicle travel lane.
- **Class III—Bicycle Route:** Provides for shared use with motor vehicle traffic; however, are often signed or include a striped bicycle lane.
- **Class IV—Separated Bikeway:** Provides a right-of-way designated exclusively for bicycle travel adjacent to a roadway and which are protected from vehicular traffic. Types of separation include, but are not limited to, grade separation, flexible posts, inflexible physical barriers, or on-street parking.

The area surrounding the project site has a partially complete bicycle network that provides first- and last-mile connectivity to the South San Francisco ferry terminal but lacks dedicated bicycle connections to the Caltrain station and residential and commercial uses west of U.S. 101. Current bicycle facilities in the project vicinity, as designated by the City's *Bicycle Master Plan* and the draft *Active South City: Bicycle and Pedestrian Master Plan* (ongoing), are shown in Figure 4.9-3 and discussed below.

Source: Fehr & Peers, 2020.

ICF Graphics ... 00662.19 (8-3-2020) JC

ICF

Figure 4.9-3
Existing and Planned Bicycle Facilities
751 Gateway Boulevard Project

- Gateway Boulevard has proposed Class II bicycle lanes between Oyster Point Boulevard and East Grand Avenue to connect to existing bicycle lanes on both roads; proposed bicycle lanes on Gateway Boulevard will provide direct access to the project site.
- Poletti Way has a short Class I mixed-use trail connection from the street's terminus to the Oyster Point Boulevard/Gateway Boulevard intersection; an extension of the trail is planned to the new Caltrain station to the south and the Bay Trail to the north (under the Oyster Point Boulevard overpass).
- Oyster Point Boulevard has Class II bicycle lanes between Gull Drive and Gateway Boulevard; Class II bicycle lanes are planned for the remainder of Oyster Point Boulevard to connect to existing bicycle lanes on Sister Cities Boulevard and Airport Boulevard.
- East Grand Avenue has intermittent Class II bicycle lanes in the East of 101 Area. A Class I trail is planned and will connect the new Caltrain station with planned trails near Forbes Boulevard, while Class II bicycle lanes are expected to be installed from Gateway Boulevard to DNA Way by summer 2020.
- The Bay Trail is a Class I mixed-use trail along the Oyster Point shoreline and Point San Bruno, part of a planned 400-mile regional trail system encircling the San Francisco Bay shoreline.

Bicyclists primarily access the project site via Gateway Boulevard, Poletti Way, Oyster Point Boulevard, East Grand Avenue, and/or the Bay Trail. Commute trip lengths, lack of continuous low stress bicycle facilities, lack of connectivity to residences and transit stations, and topography present barriers to bicycle commuting to the East of 101 area.

The reconstructed South San Francisco Caltrain station (currently under construction, with completion expected in late 2020) features a bicycle and pedestrian undercrossing that will connect the East of 101 area to the upgraded South San Francisco Caltrain station, Downtown South San Francisco, housing, and commercial services to the west. The undercrossing represents the first non-motorized connection spanning the Caltrain and U.S. 101 corridors, which are substantial barriers to east-west bicycle and pedestrian travel.

Additional relevant bicycle plans and policies (e.g., South San Francisco General Plan, East of 101 Mobility 20/20 Plan, South San Francisco Bicycle Master Plan) are discussed in Appendix D of this draft EIR.

4.9.2.6 Emergency Vehicle Access

Emergency vehicles typically use major streets through the study area when heading to and from an emergency and/or an emergency facility. Arterial roadways allow emergency vehicles to travel at higher speeds and provide enough clearance space to permit other traffic to maneuver out of the path of the emergency vehicle and yield the right-of-way. The nearest fire station to the project is Fire Station 62 at 249 Harbor Way, approximately 0.8 mile south of the project site. Emergency vehicle access to the project site is primarily from the two driveways on Gateway Boulevard, which have two travel lanes in each direction.

4.9.3 Regulatory Framework

4.9.3.1 State

Senate Bill 743

Senate Bill (SB) 743[1] is intended to better align California Environmental Quality Act (CEQA) transportation impact analysis practices and mitigation outcomes with the State's goals to reduce greenhouse gas (GHG) emissions, encourage infill development, and improve public health through more active transportation. SB 743 creates several key statewide changes to CEQA as described below.

First, SB 743 requires the Governor's Office of Planning and Research (OPR) to establish new metrics for determining the significance of transportation impacts of projects within transit priority areas (TPAs) and allows OPR to extend use of these metrics beyond TPAs. OPR selected vehicle miles traveled (VMT) as the preferred transportation impact metric and applied their discretion to require its use statewide.

Second, SB 743 establishes that aesthetic and parking impacts of a residential, mixed-use residential, or employment center projects on an infill site within a TPA shall not be considered significant impacts on the environment.

Third, the new CEQA Guidelines that implement SB 743 requirements state that vehicle level of service (LOS) and similar measures related to auto delay shall not be used as the sole basis for determining the significance of transportation impacts, and that as of July 1, 2020, this requirement shall apply statewide, but that until that date, lead agencies may elect to rely on VMT rather than LOS to analyze transportation impacts.

Finally, SB 743 establishes a new CEQA exemption for a residential, mixed-use, and employment center project that is a) within a transit priority area, b) consistent with a specific plan for which an EIR has been certified, and c) consistent with a Sustainable Communities Strategy (SCS). This exemption requires further review if the project or circumstances changes significantly.

To aid in SB 743 implementation, the following state guidance has been produced.

- OPR's *Technical Advisory on Evaluating Transportation Impacts in CEQA*[2]
- California Air Resources Board (CARB)'s *2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals*[3]
- Caltrans' *Local Development–Intergovernmental Review Program Interim Guidance, Implementing Caltrans Strategic Management Plan 2015-2020 Consistent with SB 743*[4]

---

[1] Full text of SB 743: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140SB743

[2] Governor's Office of Planning and Research. 2018. *Technical Advisory on Evaluating Transportation Impacts in CEQA*. December. Available: http://opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf. Accessed: June 10, 2020.

[3] California Air Resources Board. 2017. *2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals*. January. Available: https://ww2.arb.ca.gov/sites/default/files/2019-01/2017_sp_vmt_reductions_jan19.pdf. Accessed: June 10, 2020.

[4] Caltrans. 2016. *Local Development–Intergovernmental Review Program Interim Guidance, Implementing Caltrans Strategic Management Plan 2015-2020 Consistent with SB 743*. November. Available: https://dot.ca.gov/programs/transportation-planning/office-of-smart-mobility-climate-change/sb-743. Accessed: June 10, 2020.

CARB's *2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals* provides recommendations for VMT reduction thresholds that would be necessary to achieve the State's GHG reduction goals. CARB finds per-capita light-duty vehicle travel would need to be approximately 16.8 percent lower than existing, and overall per-capita vehicle travel would need to be approximately 14.3 percent lower than existing levels under that scenario. CARB also acknowledges that the SCS targets are not sufficient to meet climate goals. As stated in the report, "…the full reduction needed to meet our climate goals is an approximately 25 percent reduction in statewide per capita on-road light-duty transportation-related GHG emissions by 2035 relative to 2005." This estimate was made with a model that does not fully capture emerging transportation trends such as a growing e-commerce market, greater use of ridesharing services such as Uber and Lyft, plus future transitions to autonomous vehicles. As such, the level of VMT reduction necessary to reach the State's GHG reduction goals may exceed 25 percent.

OPR considered this research when developing recommended VMT thresholds. In their *Technical Advisory on Evaluating Transportation Impacts in CEQA*, OPR recommends that a per-capita or per-employee VMT that is 15 percent below that of existing development may be a reasonable threshold. This threshold is based on the abovementioned research documents from CARB as well as evidence that suggests a 15 percent reduction in VMT is achievable at the project level in a variety of place types[5] and would help the State achieve its climate goals. However, each jurisdiction must apply the statewide VMT analysis guidance based on available travel data and tools.

As discussed below, the analysis of GHG reduction goals performed by CARB indicates that a reduction of at least 16.8 percent of light-duty vehicle VMT is necessary to reach statewide goals. Light-duty VMT is appropriate for the project because most project trips are expected to be light duty vehicles such as personal automobiles used for commuting. Therefore, 16.8 percent was applied as the VMT reduction factor for the proposed project.

4.9.3.2 Regional

San Mateo City/County Association of Governments

The San Mateo City/County Association of Governments (C/CAG) is the Congestion Management Agency (CMA) for San Mateo County and is authorized to set State and federal funding priorities for improvements affecting the San Mateo County Congestion Management Program (CMP) roadway system. The C/CAG-designated CMP roadway system in South San Francisco includes State Route (SR) 82 (El Camino Real), U.S. 101, Interstate (I-)380, and I-280. C/CAG has set the LOS standards for U.S. 101 segments in the vicinity of the project site.

C/CAG has adopted guidelines to reduce the number of net new vehicle trips generated by new land development. These guidelines apply to all developments that generate 100 or more net new peak hour vehicular trips on the CMP network and are subject to CEQA review. The goal of these guidelines is that developers and/or tenants will reduce demand for all new peak hour trips (including the first 100 trips) projected to be generated by a development.

[5] California Air Pollution Control Officers Association. 2010. *Quantifying Greenhouse Gas Mitigation Measures--A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures*. Available: http://www.capcoa.org/wpcontent/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf. Accessed: June 10, 2020.

C/CAG has adopted guidelines as a part of its CMP, which are intended to reduce the regional traffic impacts of substantive new developments. The guidelines apply to all projects in San Mateo County that will generate 100 or more net new peak-hour trips on the CMP network and are subject to CEQA review. C/CAG calls for projects that meet the criteria to determine if a combination of acceptable measures is possible that has the capacity to “fully reduce,” through the use of a trip credit system, the demand for net new trips that the project is anticipated to generate on the CMP roadway network (including the first 100 trips). C/CAG has published a list of mitigation options in a memorandum. South San Francisco’s TDM ordinance is consistent with CCAG’s ordinance, so by adhering to the City’s ordinance, the proposed project would also be compliant with CCAG’s guidelines.

Commute.org

Commute.org is a joint powers authority dedicated to implementing transportation demand management programs in San Mateo County and providing alternatives to single-occupant auto travel, including both commuter and community shuttles. A Board of Directors consisting of elected officials from each of its 17 member cities, including the City of South San Francisco, and one representative from the County Board of Supervisors governs Commute.org. Commute.org manages 26 shuttle routes in San Mateo County. In South San Francisco, the Commute.org runs seven first- and last-mile weekday peak hour and direction commuter routes that connect the South San Francisco Caltrain and BART stations, and the WETA terminal within the East of 101 employment area.

Caltrain Business Plan

Caltrain is developing the *Caltrain Business Plan*[6] to guide the rail corridor’s growth through year 2040. The *Business Plan* includes both policy and technical recommendations and will help define how Caltrain service should grow and evolve in the near-term and long-term to best serve existing and future passengers. The Peninsula Corridor Joint Powers Board, Caltrain’s board of directors, adopted a *2040 Service Plan Vision*[7] in October 2019 that calls for increasing peak commute service to a minimum of eight trains per direction per hour and increased off-peak and weekend service.

4.9.3.3 Local

South San Francisco General Plan

The 1999 South San Francisco General Plan (General Plan) provides a vision for long-range physical and economic development of the City, provides strategies and specific implementing actions, and establishes a basis for judging whether specific development proposals and public projects are consistent with the City’s plans and policy standards. The general plan contains a Transportation Element, which includes policies, programs, and standards to enhance capacity and provide new linkages to provide “Complete Streets” that are safe, comfortable, and convenient routes for walking, bicycling, and public transportation to increase use of these modes of

---

6 Caltrain. Under development. *Caltrain Business Plan.* Available: https://caltrain2040.org/. Accessed: June 10, 2020.

7 Caltrain. 2019. *2040 Service Plan Vision*. October. Available: https://caltrain2040.org/wp-content/uploads/Caltrain_ServiceVisionFactSheet_V12-1.pdf. Accessed: June 20, 2020.

transportation, enable active travel as part of daily activities, reduce pollution, help reduce transportation demand, and meet the needs of all users of the streets, including bicyclists, children, persons with disabilities, pedestrians, users of public transportation, seniors, youth, and families, while continuing to maintain a safe and effective transportation system for motorists and movers of commercial goods. The general plan includes the following policies that are applicable to transportation and circulation.

- Guiding Principle 4.2-G-1: Undertake efforts to enhance transportation capacity, especially in growth and emerging employment areas such as in the East of 101 area.
- Guiding Principle 4.2-G-10: Make efficient use of existing transportation facilities and, through the arrangement of land uses, improved alternate modes, and enhanced integration of various transportation systems serving South San Francisco, strive to reduce the total vehicle-miles traveled.
- Implementing Policy 4.2-1-10: Design roadway improvements and evaluate development proposals based on LOS standards.
- Implementing Policy 4.3-I-16: Favor Transportation Systems Management programs that limit vehicle use over those that extend the commute hour.

On June 10, 2020 the City adopted a VMT threshold in accordance with the Office of Planning and Research (OPR)'s guidance in implementing Senate Bill 743; the threshold is effective July 1, 2020.

East of 101 Mobility 20/20 Plan

The City's *Mobility 20/20* plan[8] analyzes existing and future land use in the East of 101 area, with the goal of providing a framework for multimodal improvements to the area's transportation network. *Mobility 20/20* findings and recommendations will be incorporated into the City's new *Shape SSF 2040 General Plan*.[9] This new general plan envisions reducing VMT and drive-alone mode share while expanding throughput capacity along major corridors serving core employment areas in the City.

Key project opportunities identified in the City's *Mobility 20/20* plan include U.S. 101 interchange improvements and secondary north-south arterial connections to Brisbane's Sierra Point to the north and the San Francisco International Airport area to the south via a new causeway spanning San Bruno Channel. The bicycle and pedestrian network would also be substantially upgraded with separated bikeways, expanded sidewalks, and new pedestrian crosswalks. *Mobility 20/20* transit enhancements include transit-only lanes along the Oyster Point Boulevard corridor complemented by new or upgraded direct service connections between job centers and regional transit stations.

South San Francisco Complete Streets Policy

In 2012, the City adopted its Complete Streets Policy via Resolution 86-2012. The Complete Streets Policy's objective is to serve all street users as articulated in the resolution below.

- Resolution 86-2012: Create and maintain complete streets that provide safe, comfortable, and convenient travel along and across streets including streets, roads, highways, bridges, and other portions of the transportation system through a comprehensive, integrated transportation

[8] https://www.ssf.net/government/mobility-20-20
[9] https://shapessf.com/about/

network that serves all categories of users, including pedestrians, bicyclists, persons with disabilities, motorists, movers of commercial goods, users and operators of public transportation, seniors, children, youth, and families.

The Complete Streets Policy was incorporated into the City's amended general plan and includes the following policy related to the project.

- Policy 4.2-I-11: In all street projects include infrastructure that improves transportation options for pedestrians, bicyclists, and users of public transportation of all ages and abilities. Incorporate this infrastructure into all construction, reconstruction, retrofit, maintenance, alteration, and repair of streets, bridges, and other portions of the transportation network.

South San Francisco *Bicycle Master Plan*

The City's *Bicycle Master Plan* identifies and prioritizes street improvements to enhance bicycle access. The plan analyzes bicycle demand and gaps in bicycle facilities and recommends improvements and programs for implementation as described in the policy below.

- Policy 3.2-1: All development projects shall be required to conform to the Bicycle Transportation Plan goals, policies and implementation measures.

The City's *Bicycle Master Plan* is currently being updated. The current *Bicycle Master Plan* remains active until completion and adoption of the new *Active South City: Bicycle and Pedestrian Master Plan*.

South San Francisco Pedestrian Master Plan

The City's *Pedestrian Master Plan*[10] identifies and prioritizes street improvements to enhance pedestrian access. The plan analyzes pedestrian demand and gaps in pedestrian facilities and recommends improvements and programs for implementation. The Pedestrian Master Plan establishes the following policy related to the Project:

- Policy 3.2: Pedestrian facilities and amenities should be provided at schools, parks, and transit stops, and shall be required to be provided at private developments, including places of work, commercial shopping establishments, parks, community facilities and other pedestrian destinations.

South San Francisco Transportation Demand Management Ordinance

The City's Transportation Demand Management (TDM) Ordinance, which is specified in Title 20 of the City's Municipal Code in Chapter 20.400, *Transportation Demand Management* seeks to reduce the amount of traffic generated by nonresidential development and minimize drive-alone commute trips. The ordinance establishes a performance target of 28 percent minimum alternative mode share for all nonresidential projects resulting in more than 100 average daily trips and identifies higher thresholds for projects requesting a floor area ratio (FAR) bonus.

[10] City of South San Francisco. 2011. *South San Francisco Pedestrian Master Plan.* Available: https://www.ssf.net/Home/ShowDocument?id=516. Accessed: June 10, 2020.

Per the ordinance, all projects are required to submit annual mode share surveys. Project sponsors seeking an FAR bonus are required to submit triennial reports assessing project compliance with the required alternative mode share target. Where targets are not achieved, the report must include program modification recommendations and City officials may impose administrative penalties should subsequent triennial reports indicate mode share targets remain unachieved.

4.9.4 Impacts and Mitigation Measures

4.9.4.1 Significance Criteria

Based on Appendix G of the CEQA Guidelines, the proposed project would have a transportation and circulation impact if it would do any of the following.

- Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities
- Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b) related to VMT;
- Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible land uses (e.g., farm equipment); or
- Result in inadequate emergency access.

In addition to the Appendix G thresholds, City and C/CAG guidance was used to identify the following relevant thresholds of significance. Under these additional thresholds, the proposed project would have a transportation and circulation impact if it would do any of the following.

- Cause vehicle queues approaching a given movement downstream of Caltrans freeway facilities to exceed existing storage space for that movement, or considerably contribute to baseline vehicle queues that exceed storage space for that movement, resulting in a hazardous condition[11]
- Produce a detrimental impact to existing bicycle facilities, pedestrian facilities, or local transit or shuttle service

4.9.4.2 Approach to Analysis

Potential project impacts to the surrounding transportation system were evaluated for the four scenarios listed below.

- **Scenario 1: Existing Conditions—**Existing conditions represent the baseline condition upon which project impacts are measured. The baseline condition represents existing conditions as of 2019.
- **Scenario 2: Existing Plus Project Conditions—**Existing plus project conditions represent the baseline condition with the addition of the project. Traffic volumes for existing plus project conditions include existing traffic volumes plus traffic generated by the project. Existing plus project conditions were compared to existing conditions to determine potential immediate project impacts.

[11] While SB 743 notes that "traffic congestion shall not be considered a significant impact on the environment" the freeway on- and off-ramp vehicle queuing criteria was retained to assess potential hazards from project traffic exceeding ramp storage capacities. Traffic in queue represents congested, stop-and-go conditions; if queues interfere with through, or free-moving traffic streams on a freeway mainline, hazards could arise due to the differences in speed.

- **Scenario 3: Cumulative Conditions—**Cumulative conditions include transportation demand resulting from reasonably foreseeable land use changes and conditions associated with funded transportation projects by 2040. Cumulative conditions are based on land use and transportation conditions included in *Plan Bay Area 2040*,[12] as represented in the C/CAG-VTA Bi-County Transportation Demand Model (C/CAG model). The C/CAG model is a four-step trip-based travel demand model designed to forecast how land uses and transportation interact within San Mateo and Santa Clara Counties.
- **Scenario 4: Cumulative Plus Project Conditions—**Cumulative plus project conditions represent the cumulative condition with the addition of the project to determine the extent to which the project would contribute to long-term cumulative transportation impacts.

A description of the methods used to develop the VMT threshold and estimate the amount of traffic and VMT generated by the project is provided below.

Vehicle Miles Traveled

VMT Threshold

As a part of the *Shape SSF 2040 General Plan*, the City is updating its transportation impact thresholds. On June 10th, 2002, the City adopted a VMT threshold in accordance with OPR's guidance for implementing SB 743 requirements, which has become effective on July 1, 2020. The adopted VMT threshold for land use projects determines that a project would have a significant transportation impact if the VMT for the project would be 15 percent below the applicable baseline VMT.

At the time of this project analysis, the City had not yet adopted a VMT threshold. In accordance with OPR guidance, an interim threshold was developed for this project based on the metrics and methods described in detail in Appendix D and summarized here.

As discussed above, analysis of GHG reduction goals performed by CARB indicates that a reduction of at least 16.8 percent of light-duty vehicle VMT is necessary to reach statewide goals. Light-duty VMT is appropriate for the project because most project trips are expected to be light duty vehicles such as personal automobiles used for commuting. Therefore, 16.8 percent was applied as the VMT reduction factor. This threshold is more stringent than the City's recently adopted threshold of 15 percent below baseline VMT.

Home-based work (HBW) VMT per employee was identified as the project analysis metric. This metric follows OPR guidance for measuring office project VMT and helps compare the project's relative transportation efficiency to the regional average. OPR recommends using a regional geography for office projects. Neither the local City or county level geographic area is robust enough to capture the full length of most trips or evaluate the interaction of the project in a regional setting, as many commute trips exceed the City and county borders. As a result, the nine-county Bay Area region was selected as the geographic boundary for the assessment as shown in Table 4.9-1.

[12] Metropolitan Transportation Commission and Association of Bay Area Governments. 2019. *Plan Bay Area 2040 Final Plan*. Available: http://2040.planbayarea.org/. Accessed: June 10, 2020.

Table 4.9-1. Home-Based Work Vehicle Miles Traveled Per Employee Thresholds

Location	Total HBW VMT (a)	Total Employees (b)	HBW VMT per Employee (a)/(b)
Bay Area Region (Existing)	63,336,200	4,461,670	14.2
		VMT Reduction Factor	(16.8%)
		HBW VMT Per Employee Threshold	11.8
Bay Area Region (2040 Cumulative)	78,980,240	5,406,190	14.6
		VMT Reduction Factor	(16.8%)
		HBW VMT Per Employee Threshold	12.1

Source: Fehr & Peers 2020; C/CAG-VTA Bi-County Transportation Demand Model, 2019.
Notes: HBW = home-based work; VMT = vehicle miles traveled

Based on these factors, a significant impact would occur if existing HBW VMT per employee in the travel demand model's transportation analysis zone (TAZ) results in greater than 11.8 HBW VMT per employee under existing conditions. This is based on a reduction of 16.8 percent below the existing regional average of 14.2 HBW VMT per employee as shown in Table 4.9-1. A TAZ is the smallest resolution available in the C/CAG model, and represents a scale somewhere between a census block group and a census tract. Each TAZ included in the model contains information related to the existing and proposed land uses and transportation options for zone. Therefore, the transportation properties of the project's TAZ are an appropriate proxy for transportation properties of the project itself.

Project VMT Generation

Project-generated HBW VMT per employee is calculated based on the average HBW VMT generated by employees working in the C/CAG travel demand model TAZ where the project is located divided by the number of jobs within the TAZ as described in Appendix D. Based on this methodology, the project would generate 16.2 HBW VMT per employee under existing conditions. The C/CAG model variables are presented in Table 4.9-2.

Table 4.9-2. Home-Based Work Vehicle Miles Traveled per Employee

Location	Total HBW VMT (a)	Total Employment (b)	HBW VMT per Employee (a)/(b)
East of 101 Area	581,977	35,831	16.2
Bay Area Region	63,336,203	4,461,670	14.2
		VMT Reduction Factor	(16.8%)
		VMT Per Employee Threshold	11.8

Source: Fehr & Peers 2020; C/CAG-VTA Bi-County Transportation Demand Model, 2019.
Notes: HBW = home-based work; VMT = vehicle miles traveled

As discussed in Chapter 3, *Project Description*, the project is required to implement a TDM program. While SSFCM Section 20.400 does not call out a specific alternate mode-share (AMS) requirement for the Gateway Specific Plan District, similar zoning districts, and General Plan requirements in the East of 101 area require an AMS of 35 – 40 percent for development of a Floor Area Ratio of 1.0 – 1.25, and this standard would be applied to the 751 Gateway project, consistent with the City's requirements, and policies to increase AMS and decrease single occupancy vehicle traffic. While the City interprets the regulatory TDM requirements to require a 35 – 40 percent AMS, the CEQA analysis assumes a higher and more conservative drive-alone share (AMS of 26 percent), consistent with the City/County Association of Governments of San Mateo County (C/CAG) model, and analysis for other similar projects within the City and the region. The proposed project would include a flexible TDM plan to achieve an alternative mode use goal[13] of 35 percent for the proposed project within the first three years of reporting, with an increase to 40 percent in the fourth year of reporting.[14] However, reductions in non-drive alone mode share are not necessarily interchangeable with VMT reductions on a percentage-point-for-percentage-point basis. First, mode share targets do not necessarily correlate with trip generation and trip length; although many East of 101 employers meet their non-drive alone mode share targets, vehicle trip generation and trip lengths are similar (if not higher than) regional averages based on the C/CAG travel demand model outputs. Second, a non-drive alone mode share target includes passenger vehicle-based modes such as vanpools and carpools, which may dilute its effectiveness for VMT reductions. Third, VMT is a measure of daily activity for all trips, whereas accounting for non-drive alone mode share targets focuses only on commute trips. Therefore, project HBW VMT per employee was not adjusted based on the project TDM program's plan. This analysis therefore represents a conservatively high estimate of project VMT, because it does not fully account for the VMT reductions that may occur as a result of the project's TDM program.

The project's effect on VMT describes changes in VMT generation from neighboring land uses by comparing area VMT for "no project" and "plus project" scenarios. Given the similarities in the project land uses to those of the surrounding land uses (e.g., location that generates higher than average VMT for the region, single-use employment centers, and limited non-auto access), the analysis of project-generated HBW VMT per employee based on East of 101 Area VMT provides a reasonable estimation of the environmental consequences associated with the project's effect on VMT.

While land use changes are currently under consideration for the *Shape SSF 2040 General Plan*, the current general plan and the current City land use policy envisions continued single-use employment within the East of 101 area; therefore, VMT is unlikely to be substantially reduced from existing conditions, although implementation of programmatic TDM measures and improving first- and last-mile transit connections can help to increase transit use, and reduce single-occupancy vehicle trips.

---

13 The alternative mode use goal indicates the percentage of total trips that would use alternative transportation modes rather than single-occupancy vehicle trips.

14 Silvani Transportation Consulting. 2019. *Proposed Transportation Management Plan: 751 Gateway Blvd., South San Francisco CA.* December.

Overall, the existing land use and transportation characteristics of the East of 101 area contribute to the East of 101 area's higher-than-average VMT per employee. As a single-use employment center, all home-based trips begin or end outside the East of 101 area, requiring longer travel along auto-oriented roadways or via transit service that is currently not competitive with the automobile. In contrast, mixed-use settings near transit can further reduce trip generation and trip lengths while increasing the use of non-auto modes.

Trip Generation, Distribution, and Assignment

The amount of traffic added to the roadway system by the project was estimated using a three-step process: trip generation, trip distribution, and trip assignment. The first step estimates the amount of traffic that would be generated once the project was built and fully occupied. The second step estimates the direction of travel to and from the project site. The third step assigns project trips to specific street segments and intersection turning movements. Analysis results are described below.

Project Trip Generation

Project traffic added to the surrounding roadway system was estimated using data collected in fall 2019 for the existing office and research and development (R&D) campus adjacent to the project site. Local travel demand data were used instead of national averages because of the unique conditions in the East of 101 area, including peak period spreading, employment land use mix, and higher rates of participation in TDM programs. In contrast, national trip generation databases such as the Institute of Transportation Engineers (ITE) *Trip Generation Manual,* 10th edition[15] is generally collected at suburban sites with limited non-auto access and less congestion.

Driveway count data were collected at nine driveways at the surrounding office/R&D campus representing trip generation for nine existing buildings and 1.4 million square feet. A trip generation rate for existing uses was developed and applied to the project square footage to calculate project travel demand. The sample site driveway traffic data are presented in Appendix D.

The project trip generation rate was derived from the site-specific data and was multiplied by the size of the project in gross square feet to determine daily, weekday morning, evening peak hour vehicle trip generation volume (Table 4.9-3). Vehicle trips are summarized for the entire project site (including both the existing 701 Gateway building, which would remain, and the proposed 751 Gateway building), and for each building individually. The net new project trips are for the proposed 751 Gateway only, and the trip generation analysis subtracted existing trips associated with the existing 701 Gateway building from the project site trips. According to this trip generation analysis, the new 208,800 square foot office building would generate approximately 1,784 daily, 206 morning peak hour (i.e., 143 inbound and 64 outbound), and 172 evening peak hour (i.e., 45 inbound and 127 outbound) net new trips.

[15] Institute of Transportation Engineers. 2017. *Trip Generation Manual*. 10th edition. September. Available: https://www.ite.org/technical-resources/topics/trip-and-parking-generation/trip-generation-10th-edition-formats/. Accessed: June 10, 2020.

Table 4.9-3. Project Trip Generation

Land Use	Size (KSF)	Daily		A.M. Peak Hour				P.M. Peak Hour			
		Total	Rate	In	Out	Total	Rate	In	Out	Total	Rate
Total Trips for the project site (701 and 751 Gateway Boulevard buildings)	382.3	3,267	8.6	262	116	378	0.99	82	232	315	0.82
Existing Trips for the 701 Gateway Boulevard building, which would remain	173.5	1,483		119	53	172		37	105	143	
Net New Trips for the proposed 751 Gateway Boulevard building	208.8	1,784		143	64	206		45	127	172	

Source: Fehr & Peers 2020.

Notes: Trip generation rates based on 2019 driveway count data collected at the Gateway Campus in the East of 101 area.

Project Trip Distribution

The directions of approach and departure for the project traffic were estimated based on C/CAG's travel demand model and the City' travel demand model, which has greater sensitivity to local travel patterns. Figure 4.9-4 shows the general trip distribution pattern for the project. Most of the project traffic is split between the north (33 percent) and south (49 percent) U.S. 101 approaches to the East of 101 area. Within South San Francisco, approximately 16 percent of project traffic is projected to come from west of U.S. 101, while 2 percent is expected to come from within the East of 101 area.

Project Trip Assignment

Project trips were assigned to the roadway system based on the directions of approach and departure discussed above. The locations of complementary land uses and local knowledge of the study area determined specific trip routes. Figure 4.9-5 shows the expected increases in peak hour intersection turning movement volume due to the project.

Project traffic would access the roadway network via two driveways along the Gateway Boulevard frontage, to the south of Oyster Point Boulevard. Inbound vehicular traffic accesses the project site via Gateway Boulevard from both sides and outbound traffic departs via Gateway Boulevard in the opposite direction.

Unsignalized Intersections

Traffic conditions at the unsignalized study intersections (stop sign and yield sign-controlled intersections) were evaluated using the method from Chapter 17 of the Highway Capacity Manual. With this method, operations are defined by the average control delay per vehicle (measured in seconds) for each stop-controlled approach that must yield the right-of-way. At four-way stop-controlled intersections, the control delay is calculated for the entire intersection and for each approach. The delays and corresponding LOS for the entire intersection are reported. At two-way stop-controlled intersections the movement with the highest delay and corresponding LOS is reported.

Freeway Ramp Queuing Analysis

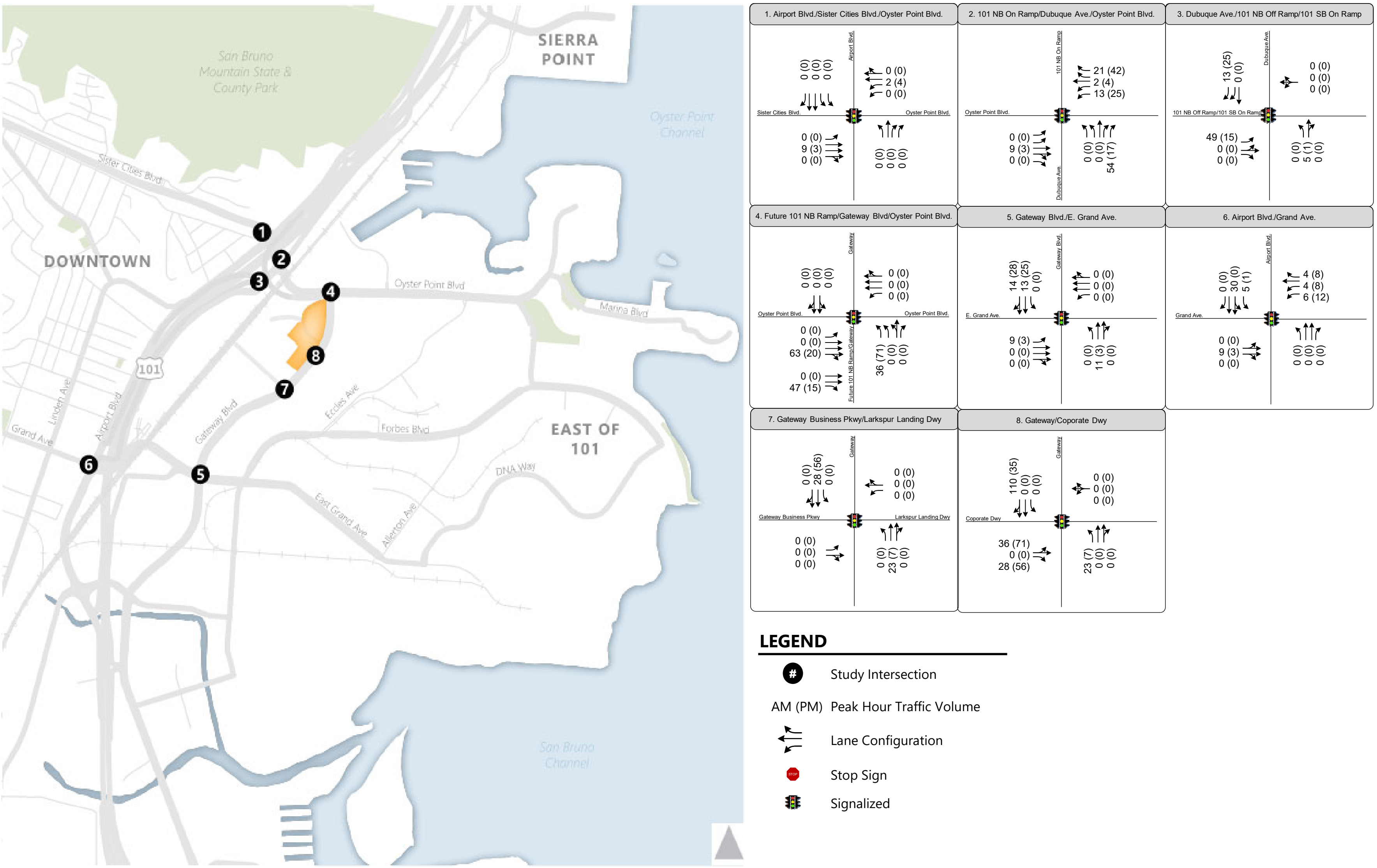
Three freeway off-ramps were selected for analysis based on local traffic patterns, project trip assignment forecasts, input from the City, and engineering judgment to assess conditions where the addition of project trips may result in hazards to road users. The study locations are listed below.

- U.S. 101 southbound off-ramp at Oyster Point Boulevard
- U.S. 101 northbound off-ramp at East Grand Avenue
- U.S. 101 northbound off-ramp at Dubuque Avenue

In November 2019, traffic counts were collected at the approaches and departures to the three freeway off-ramps during the morning (i.e., from 7:00 to 9:00 a.m.) and evening (i.e., from 4:00 to 6:00 p.m.) peak periods. During all counts, weather conditions were generally dry, no unusual traffic patterns were observed, and the South San Francisco Unified School District was in regular session.

Source: Fehr & Peers, 2020.

Figure 4.9-4
Project Trip Distribution
751 Gateway Boulevard Project



Source: Fehr & Peers, 2020.

ICF

Figure 4.9-5
Project Trip Assignment
751 Gateway Boulevard Project

The morning peak hour was selected as the analysis period since the project, and the East of 101 area generally generate the majority of inbound trips during the morning peak period where inbound trips would be using the freeway off-ramps. Conversely, during the evening peak period, the study off-ramps have significantly lower volumes, and few project trips would use the off-ramps. Therefore, the off-ramps queuing analysis performed for the morning peak hour is expected to encompass all potential impacts.

4.9.4.3 Impact Evaluation

Impact TR-1: Existing HBW VMT per employee in the travel demand model TAZ that encompasses the project result in greater than 16.8 percent below the regional average HBW VMT per employee under existing plus project and cumulative plus project conditions. (*Significant and Unavoidable with Mitigation*)

As shown in Table 4.9-4, using the average VMT in the East of 101 area, the project would generate approximately 16.2 HBW VMT per employee under existing conditions, which is greater than the regional average total of 14.2 HBW VMT per employee and the per-employee significance threshold of 11.8 HBW VMT (based on a VMT rate of a reduction of 16.8 percent below the regional average). Therefore, the project would have a ***significant*** impact on VMT under existing plus project conditions.

Under cumulative conditions, the project would generate approximately 14.0 HBW VMT per employee, which is similar to the cumulative regional average total of 14.6 HBW VMT per employee but greater than the per-employee significance threshold of 12.1 HBW VMT per employee (based on a reduction of 16.8 percent below the cumulative regional average HBW VMT per employee). Therefore, the project would be a cumulatively considerable contributor to a cumulatively ***significant*** impact on VMT under cumulative plus project conditions. A comparison between the Bay Area region and East of 101 per-employee VMT averages under Existing and Cumulative conditions is presented in Table 4.9-4.

Table 4.9-4. VMT Impact Determination

Location	Total HBW VMT (a)	Total Employment (b)	HBW VMT per Employee (a)/(b)
Bay Area	63,336,203	4,461,670	14.2
East of 101 Area	581,997	35,831	16.2
	VMT Per Employee Threshold (16.8% below regional average)		**11.8**
		Project VMT Impact?	**Yes**
Bay Area	78,980,239	5,406,188	14.6
East of 101 Area	736,810	52,660	14.0
	VMT Per Employee Threshold (16.8% below regional average)		**12.1**
Cumulatively Considerable Contributor to Significant Cumulative VMT Impact?			**Yes**

Source: Fehr & Peers 2020; C/CAG-VTA Bi-County Transportation Demand Model, 2019.

First- and last-mile transit connections and active transportation improvements would likely yield the greatest project VMT reductions. Mitigation Measure TR-1, First- and Last-mile Strategies, would support and enhance the effectiveness of the project's last-mile transit connection strategies, and decrease use of single-occupancy vehicles. Mitigation Measure TR-1 would be unlikely to substantially reduce HBW VMT per-employee, but would aid in reducing project auto travel demand. The components of Mitigation Measure TR-1 are shown in Figure 4.9-6. Mitigation Measure TR-1 includes some improvements that are not fully funded; as a result their implementation timeline is uncertain in regard to the project's construction timeline. Additionally, the mitigation measure is unlikely to reduce the project's HBW VMT by 27 percent (i.e., the amount needed to reduce the project's HBW VMT per employee to below the applicable thresholds, as shown in Table 4.9-4). Therefore, this impact would be ***significant and unavoidable with mitigation***.

For the off-site improvements where a fair-share contribution is identified, the City would collect payment from the project sponsor and would allocate those funds for the specific improvements identified. Specific details of the fair-share contributions would be addressed in the project's conditions of approval, but in any case would comply with the Mitigation Fee Act. Specific right-of-way needs for Mitigation Measure TR-1 are described as part of each off-site improvement, if applicable. The potential environmental impacts of the first two strategies under Mitigation Measure TR-1, the upgrades to the Poletti Way sidewalk and the extension of the Class II bicycle lanes on Gateway Boulevard, would be analyzed under the CEQA review prepared for the *Active South City: Bicycle and Pedestrian Master Plan.* Any impacts associated with the construction of upgrades to the Poletti Way sidewalk and the extension of the Class II bicycle lanes on Gateway Boulevard would be temporary and minor in nature (e.g., short-term construction impacts related to air quality, noise, and traffic), and would not result in a substantial adverse impact on the environment. The third strategy, participation in first-/last-mile shuttle program(s), would not increase the number or frequency of shuttles operating, and as such would not result in long-term air quality, GHG, or noise impacts. If existing shuttle stops are used as part of this strategy, existing conditions would not change and there would be no effect on the environment. If new shuttle stops are used, shuttles may need to be re-routed and additional shuttle trips may be required, but VMT would likely still be reduced because the additional shuttle activity would replace single-occupancy vehicle trips. Any impacts associated with the construction of new shuttle stops would be temporary and minor in nature (e.g., short-term construction impacts related to air quality, noise, and traffic), and would not result in a substantial adverse impact on the environment. The last strategy, adding directional curb ramps and high visibility crosswalks, would not increase the number or frequency of shuttles operating, and as such would not result in long-term air quality, GHG, or noise impacts. Any impacts associated with this strategy would occur during construction and would be temporary and minor in nature. Thus, no adverse secondary impacts on the environment would occur with implementation of Mitigation Measure TR-1.

Project Site

Improvement Areas

Caltrain Station

1. Pay fair-share contribution toward upgrading Poletti Way path to Class I shared path standards, including trail crossing treatments and connections to Project building entries and bicycle parking facilities.
2. Pay fair-share contribution toward extending Class II bicycle lanes on Gateway Boulevard between East Grand Avenue and Oyster Point Boulevard
3. Participate in TMA or Commute.org shuttle program. Construct new southbound on-street shuttle stop, if desired by Project sponsor.
4. Provide high visibility crosswalks and directional curb ramps at the Oyster Point Boulevard / Gateway Boulevard and Gateway Boulevard / Gateway Business Park intersections

Source: Fehr & Peers, 2020.

ICF Graphics ... 00662.19 (8-3-2020) JC

ICF

Figure 4.9-6
Components of Mitigation Measure TR-1
751 Gateway Boulevard Project

Mitigation Measure TR-1: First- and Last-mile Strategies

The project sponsor shall fund the design and construction of the following off-site improvements to support the project's first- and last-mile strategies necessary to support auto trip reduction measures.

- The project shall provide a fair-share contribution towards the City's cost of facilities and improvements identified below for the purposes of upgrading Poletti Way sidewalk to a Class I shared-use bicycle and pedestrian pathway between the Caltrain Station at East Grand Avenue, and the street's northern terminus as identified in the *Active South City: Bicycle and Pedestrian Master Plan* (currently in draft form), or if said Master Plan is in the process of being amended or updated at the time of the first building permit for the project, then the project shall instead provide a fair-share contribution in an equivalent amount towards improvements and upgrades of equivalent design and purpose, as determined by the City's Chief Planner in his reasonable discretion. The Gateway Property Owners Association is currently in the process of dedicating the Poletti Way right-of-way to the City and the dedication is expected to be completed by the end of 2020. The improvement will include curb ramps, curb and gutter, signage, markings, and other changes necessary to meet Caltrans and City of South San Francisco Class I bikeway standards. Specific improvements will include upgrades at vehicular crossings (such as driveways and minor streets) to provide 10-foot minimum wide barrier-free accessible ramps that permit direct, two-way bicycle and pedestrian travel. Adequate warning and regulatory signage and markings will be provided to alert road users of potential conflicts per the *California Manual on Uniform Traffic Control Devices* (CAMUTCD). Existing pavement conditions will be assessed and reconstructed if necessary, per City of South San Francisco standards. The project's obligation to pay a fair share contribution toward this improvement is contingent upon the City (i) adopting a final *Active South City Bicycle and Pedestrian Master Plan* that includes the improvement, or City approval of a plan for improvements of equivalent design and purpose; (ii) acquiring any necessary right of way; and (iii) implementing a program that will require fair share contributions from other developments in the East of 101 area that will benefit from the improvement.
- The project shall provide a fair share contribution toward the City's cost of facilities and improvements identified below for the purposes of extending Class II bicycle lanes on Gateway Boulevard between East Grand Avenue and Oyster Point Boulevard, assuming 1,100 linear feet of frontage. This improvement will include striping new bicycle lanes and restriping existing lanes. Extending bicycle lanes will support enhanced bicycle access from south of the project site as identified in the *Active South City: Bicycle and Pedestrian Master Plan* (currently in draft form). If said Master Plan is in the process of being amended or updated at the time of the first building permit for the project, then the project shall instead provide a fair-share contribution in an equivalent amount towards improvements and upgrades of equivalent design and purpose, as determined by the City's Chief Planner in his reasonable discretion.
- The project shall participate in first-/last-mile shuttle program(s) to Caltrain, BART, and the ferry terminal. Shuttles may be operated by Commute.org and/or a future East of 101 transportation management agency. The project may provide an on-site loading zone for potential future private shuttles or pick-up/drop-off operations; however, public shuttle shall utilize on-street shuttle stops located adjacent to the project site in order to minimize additional travel time for shuttles. Southbound shuttles on Gateway Boulevard shall use the existing shuttle stop at the intersection of Gateway Boulevard and the

Gateway Business Park driveway (approximately 500 feet south of the project site) or the project may construct a new southbound shuttle stop along the project frontage on Gateway Boulevard. A new shuttle stop shall accommodate small shuttles and larger buses and shall be designed in close coordination with the City and the shuttle operators taking into consideration planned roadway improvements, other new developments, and rider needs. Northbound shuttles on Gateway Boulevard shall use the future shuttle stop at the Gateway Business Park driveway (directly across the street from the project site) as proposed as part of the Gateway of Pacific project.

- The project shall provide a more direct connection to on-street shuttle stops by adding directional curb ramps and high visibility crosswalks at the northern leg of the Gateway Boulevard/Gateway Business Park driveway/Project driveway intersection. Since no crosswalk currently existing across the northern leg of this intersection, the project shall review existing intersection signal timing and adjust if necessary, to accommodate the new pedestrian phase. Add high-visibility crosswalks on the south side of the Oyster Point Boulevard/Gateway Boulevard intersection (southern and eastern legs of the intersection) to improve access to shuttle stops on Oyster Point Boulevard.

Impact TR-2: The proposed project would not cause vehicle queues approaching a given movement downstream of Caltrans freeway facilities to exceed existing storage space for that movement or add vehicle trips to existing freeway off-ramp vehicle queues that exceed storage capacity resulting in a potentially hazardous condition. (*Less than Significant*)

Table 4.9-5 presents existing weekday morning peak hour vehicle queues at the three U.S. 101 off-ramp study locations. The project would extend or contribute to queues longer than storage distances at the U.S. 101 southbound off-ramp at Oyster Point Boulevard. Specifically, the queue would spill back from the eastbound right turn lane approaching the Oyster Point Boulevard/Gateway Boulevard intersection. However, the queue would not interfere with the U.S. 101 freeway mainline as the combined right turn and through queue lengths are less than the overall 3,100-foot ramp storage distance. The project therefore would not result in a hazardous condition at this location.

Table 4.9-5. Existing Weekday Morning Peak Hour 95th Percentile Queues

Approach Lanes	Storage Distance	Existing		Existing Plus Project	
		Volume	Queue Length	Volume	Queue Length
U.S. 101 Southbound Off-Ramp at Oyster Point Boulevard (A.M. Peak)					
Through	3,100	704	**513**	704	**513**
Right	350	319	**547**	366	**650**
U.S. 101 Northbound Off-Ramp at East Grand Avenue (A.M. Peak)					
Left	1,775	131	200	131	200
Right	1,775	639	1,020	639	1,020
U.S. 101 Northbound Off-Ramp at Dubuque Avenue (A.M. Peak)					
Left/Through	1,000	891	365	940	386
Right	300	74	27	74	27

Notes: **Bold type** indicates conditions where queue length exceeds intersection movement capacity. Queues do not take into account downstream spillover from adjacent intersections. Storage distance and queues in feet per lane.
Source: Fehr & Peers, 2020.

Table 4.9-6 presents cumulative weekday morning peak hour vehicle queues at the three U.S. 101 off-ramp study locations. The project would extend or contribute to queues longer than storage distances at the U.S. 101 southbound off-ramp at Oyster Point Boulevard. Specifically, the queue would spill back from the eastbound right turn lane approaching the Oyster Point Boulevard/Gateway Boulevard intersection. However, similar to existing plus project conditions, the queue would not interfere with the U.S. 101 freeway mainline as the combined right turn, and through queue lengths are less than the overall 3,100-foot ramp storage distance. Cumulative plus project traffic therefore would not result in a hazardous condition at this location.

The analysis shows that Project vehicle trips that could interfere with the freeway mainline are concentrated at the U.S. 101 southbound off-ramp at Oyster Point Boulevard and the U.S. 101 northbound off-ramps at East Grand Avenue and Dubuque Avenue, but project trips would not exceed ramp storage capacities and interfere with the freeway mainline. Therefore, the project would have a ***less-than-significant*** impact on freeway ramp queuing under existing plus project conditions and a ***less than cumulatively considerable*** impact under cumulative plus project conditions. No mitigation is required.

Table 4.9-6. Cumulative Weekday Morning Peak Hour 95th Percentile Queues

Approach Lanes	Storage Distance	Cumulative		Cumulative Plus Project	
		Volume	Queue Length	Volume	Queue Length
U.S. 101 Southbound Off-Ramp at Oyster Point Boulevard (A.M. Peak)					
Through	3,100	1,813	**1,553**	1,813	**1,553**
Right	350	654	**1,162**	701	**1,255**
U.S. 101 Northbound Off-Ramp at East Grand Avenue (A.M. Peak)					
Left	1,775	216	330	216	330
Right	1,775	683	1,090	683	1,090
U.S. 101 Northbound Off-Ramp at Dubuque Avenue (A.M. Peak)					
Left/Through	1,000	425	1,317	1,366	442
Right	300	22	374	74	321

Notes: **Bold type** indicates conditions where queue length exceeds intersection movement capacity. Queues do not take into account downstream spillover from adjacent intersections. Storage distance and queues in feet per lane.
Source: Fehr & Peers, 2020.

Impact TR-3: The proposed project would not produce a detrimental impact to existing bicycle or pedestrian facilities, or conflict with adopted plans and programs. (*Less than Significant*)

Construction

Construction activities could potentially interfere with programs, plans, ordinances, or policies if temporary closures impede roadways, bikeways, or pedestrian paths in a way that prohibits the achievement of identified goals. Similarly, construction activities could have a detrimental impact on existing bicycle and pedestrian facilities if temporary closures impede the use of these facilities. However, no temporary road closures that would affect the public right-of-way would be required during project construction. While temporary sidewalk rerouting on Gateway Boulevard is expected and roadway traffic control would be used as needed during construction, both detours would be temporary in nature and would not fully impede movement or have a sustained detrimental impact on existing bicycle and pedestrian facilities. Therefore, the project would not produce a detrimental impact on existing bicycle and pedestrian facilities during construction and construction-related conflicts with programs, plans, ordinances, or policies addressing the circulation system would be ***less than significant***. No mitigation is required.

Operation

The project would generate additional vehicle trips adjacent to existing sidewalks and bicycle facilities and would generate some new walking and bicycling trips. However, the project would not worsen existing or planned bicycle or pedestrian facilities. The project includes both long-term protected (i.e., Class I) and short-term (Class II) bicycle parking spaces in compliance with the City's code requirements. Class I bicycle parking spaces are typically lockers or restricted access parking rooms and are intended for employees. Class II bicycle parking spaces are standard bicycle racks and are mostly intended for visitors. Bicycle racks should be located near entrances where they are highly visible.

The project would not produce a detrimental impact to existing bicycle or pedestrian facilities or conflict with adopted policies in adopted City plans summarized in Appendices B through Appendix D. Therefore, the project's impacts to walking and bicycling would be ***less than significant*** under existing plus project and ***less than cumulatively considerable*** under cumulative plus project conditions. In addition, operation-related conflicts with programs, plans, ordinances, or policies addressing the circulation system would be ***less than significant*** under existing plus project conditions and ***less than cumulatively considerable*** under cumulative plus project conditions. No mitigation is required.

Impact TR-4: The proposed project would not produce a detrimental impact to local transit or shuttle service, or conflict with adopted plans and programs. (*Less than Significant with Mitigation*)

The project would generate vehicle trips in the vicinity of existing transit services and would generate some new transit trips to existing routes. Commute.org shuttles travel along the project's frontage on Gateway Boulevard and Caltrain operates less than 1 mile from the project site. The addition of 206 vehicle trips during the morning peak hour, or three to four new vehicles per minute, would not create a disruption to transit service surrounding the project site. Project-added vehicle trips represent approximately 3 percent of entering volumes at study intersections during the morning and evening peak hours. The project may add net new transit trips to both Caltrain and Commute.org shuttles, but both operators are expected to be able to handle the additional ridership either through existing available capacity or additional service.

Other than the proposed on-site shuttle stop (discussed below), the project would not include features (including the proposed driveways) that would cause disruptions to existing or planned transit service or transit stops. The project would not conflict with any adopted transit system plans, guidelines, policies, or standards, as described in Appendix D.

As shown in Figure 3-4 in Chapter 3, *Project Description*, the project's site plan identifies an on-site shuttle stop intended for use by private Gateway shuttles and public Commute.org shuttles. The on-site shuttle stop placement and access constraints has the potential to add several minutes to existing Commute.org shuttle routes as described below.

- The current Oyster Point BART shuttle and Oyster Point ferry shuttle would need to divert from its route in a 0.25 mile loop, which would include two new traffic light cycles at the Oyster Point Boulevard/Gateway Boulevard intersection and the Gateway Boulevard/Gateway Business Park driveway entrance. The Oyster Point Boulevard/Gateway Boulevard intersection experiences congested traffic conditions, operating at LOS F in the existing morning peak hour and LOS F in the cumulative morning and evening peak hours, suggesting these shuttles may experience substantial delays. New routing and/or additional route creation for both routes are likely as public and private services consolidate to improve overall frequency and other efficiencies. New signal timing, new turn lanes and other street improvements planned may also improve conditions.
- The current Oyster Point Caltrain shuttle would require an extensive route diversion for northbound shuttles since no access is provided via Gateway Boulevard, forcing shuttles to navigate through parking lots accessed via Poletti Way to access the shuttle stop. This diversion would be approximately 0.5 mile via slow speed parking aisles, suggesting this shuttle may also experience noticeably longer run times. Again, the potential new routing, new stop locations, and new routes are likely to minimize these additional delays.

Commute.org's existing shuttle routes already include numerous route diversions, the sum of these diversions results in longer travel times and wait times, which ultimately discourages transit ridership. Adding new such diversions should be avoided. The project's site plan therefore may pose a ***significant*** impact to public shuttle operations. The project sponsor should coordinate closely with shuttle operators.

Enhanced shuttle routes and stops could potentially look different than the existing Commute.org network with the consolidation of private and public services. Implementation of Mitigation Measure TR-1, First- and Last-mile Strategies Improvements, would improve pedestrian connections with existing and/or new public shuttle stops and enable the project to limit travel time effects on existing shuttle routes by eliminating additional route diversions. By providing on-street rather than on-site shuttle stops, Mitigation Measure TR-1 would accommodate first- and last-mile connections without causing diversions to existing transit routes, which would limit the project's effect on travel time for existing shuttles.

The project's effects under cumulative 2040 conditions would be similar to that of existing conditions. Improvements to Caltrain via the Peninsula Corridor Electrification Project and the South San Francisco Station Improvement Project would provide enhanced connectivity and capacity to accommodate project trips. There are no fully funded changes to bicycle, pedestrian, or transit conditions adjacent to the project site.

Therefore, project transit impact impacts would be ***less than significant with mitigation*** under existing plus project conditions and ***less than cumulatively considerable*** under cumulative plus project conditions.

Impact TR-5: The proposed project would not substantially increase hazards due to a geometric design feature or incompatible uses. (*Less than Significant*)

The proposed project would not create any new or worsen any existing geometric design features that cause hazards. The project would use two existing driveways off Gateway Boulevard (one is right-in right-out only and the other is signalized and full access), but would not change the geometry of the adjacent roadways. Sight distance at the driveways is not expected to change from what is available under existing conditions and is expected to be adequate for drivers exiting the project site and for pedestrians crossing the driveways. Any future vegetation located in the sight triangles at driveways would be maintained to prevent restricting drivers' sight distance when exiting the driveways. The project would not include any uses that are incompatible with the surrounding land use or the existing roadway system. Therefore, the project is not expected to result in a substantial increase to hazards, and the project's impacts to hazards would be ***less than significant*** under existing plus project conditions and ***less than cumulatively considerable*** under cumulative plus project conditions. No mitigation is required.

Impact TR-6: The proposed project would not result in inadequate emergency access. (*Less than Significant*)

Vehicle trips generated by the project would represent a small percentage of overall daily and peak hour traffic on roadways and freeways in the study area. The project would generate 206 morning peak hour and 172 evening peak hour net new vehicle trips, which are distributed to study intersections. Project-added vehicle trips represent approximately 3 percent of entering volumes at study intersections during peak hours. The project would not include features that would alter emergency vehicle access routes or roadway facilities; fire and police vehicles would continue to have access to all facilities around the entire City. Upon construction, emergency vehicles would have full access to the project site. Therefore, the project would result in adequate emergency access, and the project's impacts to emergency access would be ***less than significant*** under existing plus project conditions and ***less than cumulatively considerable*** under cumulative plus project conditions. No mitigation is required.

4.9.4.4 Cumulative Impacts

The impact evaluation above considered cumulative plus project conditions; as a result, the analysis above considers cumulative impacts.

4.10 Less-than-Significant Impacts

In the course of evaluating certain topics included in the California Environmental Quality Act (CEQA) Guidelines Appendix G checklist, the proposed 751 Gateway Boulevard Project (proposed project) was found to have less-than-significant impacts or no impacts due to the project type and location. This section briefly describes these effects, pursuant to CEQA Guidelines section 15128. Note that some of the topics in which the proposed project was determined to have no impact or a less-than-significant impact are addressed in the various draft environmental impact report (EIR) sections (Sections 4.2 through 4.10) to provide a more comprehensive discussion as to why impacts would be less than significant and provide more detail for decision makers and the general public.

Each topic includes a brief description of the regulatory framework, significance criteria, approach to analysis, and impact evaluation. Information about the environmental setting of the proposed project is incorporated within the impact analysis discussions for the impact areas below, where necessary, to provide a baseline context for the impact analysis.

4.10.1 Aesthetics

4.10.1.1 Regulatory Framework

Local

South San Francisco General Plan

The 1999 General Plan provides a vision for long-range physical and economic development of the City, provides strategies and specific implementing actions, and establishes a basis for judging whether specific development proposals and public projects are consistent with the City's plans and policy standards. The General Plan contains a Parks, Public Facilities, and Services Element, which outlines policies relating to parks and recreation, educational facilities, and public facilities. The General Plan includes the following policy applicable to aesthetics:

- Policy 5.1-I-9: Improve the accessibility and visibility of Sign Hill Park and the bayfront. Appropriate departments of the City should study issues of access, safety, and protection of surrounding neighborhoods in conjunction with enhanced access programs to ensure that greater use of Sign Hill Park does not create unacceptable impacts on surrounding areas.

East of 101 Area Plan

The *East of 101 Area Plan*, which was adopted in 1994 and most recently amended in 2016, sets forth specific land use policies for the East of 101 Area. The *East of 101 Area Plan* provides that the "land use and entitlement limitations (including, but not limited to, permitted uses and Floor Area Ratios) of the Gateway Specific Plan are not affected by the Area Plan, and will continue in force in the Gateway Area. … Developments on the Gateway site should conform to other polices of [the East of 101 Area] Plan, including the Design Guidelines in the Design Element …" As described in Chapter 3, *Project Description*, applicable design-level policies of the Plan include all policies of the design element, as well as Land Use Element policies LU-8a (Gateway Specific Plan uses), and LU-8b (Gateway Specific Plan FAR), Specifically, Policy LU-8a states that the uses allowed in the Gateway Specific Plan Area are those specified in the Gateway Specific Plan. In addition, Policy LU-

8b provides that the maximum FAR in the Gateway Specific Plan Area is that specified in the Gateway Specific Plan. Per Policy IM-5, the *Gateway Specific Plan* is not affected by the land use regulations of the *East of 101 Area Plan*.

Gateway Specific Plan

The Gateway Specific Plan covers the portion of the East of 101 Area from east of the Caltrain right-of-way to the eastern boundary of the parcels along the east side of Gateway Boulevard and the area between Oyster Point Boulevard and Grand Avenue on the northern and southern boundaries. The Specific Plan is "intended to provide for various commercial and research and development land uses integrated by consistent development standards." According to SSFMC Table 20.220.003 (Land Use Regulations – Gateway Specific Plan District), office for professional or business purposes is permitted within all districts within the Gateway Specific Plan Area (districts I, II, III, IV, and V). Research and development is permitted in GSPD districts II, III, IV, and V.IV. The project site is within District IV. The Gateway Specific Plan provides development policies which outline limitations on the type, size, and height of the buildings developed within the Gateway Specific Plan Area. In addition, the Gateway Specific Plan incorporates specific policies for signage, open space, landscaping, and lighting requirements to ensure that buildings developed within the Specific Plan area adhere to the same development policies and are generally similar in appearance, size, and structure.

South San Francisco Zoning Ordinance

The City's zoning ordinance prescribes development and site regulations that apply to development in all districts. Brief descriptions of applicable sections of the zoning ordinance related to aesthetics are provided below:

- *Municipal Code Section 20.220, Gateway Specific Plan District*: The standards of this section apply to all new development within the Gateway Specific Plan area. The section establishes the type, location, intensity and character of development that is permitted to take place within the plan area, while allowing for creative and imaginative design concepts. The section provides specific requirements regarding exterior building design, tree protection, landscaping, as well as guidelines for project review, among many other aspects of development.
- *Municipal Code Section 20.300.008*, *Lighting and Illumination*: The standards of this section apply to all new development and additions that expand the existing floor area by 10 percent or more. All exterior doors during the hours of darkness shall be illuminated with a minimum of 1 foot candle of light for all nonresidential buildings. The standards also limit the maximum height of a lighting fixture to 20 feet within 100 feet of any street frontage or 25 feet in any other location for districts with the Business Commercial designation. In addition, all lighting fixtures shall be shielded so as to not produce obtrusive glare on the public right-of-way or adjoining properties.
- *Municipal Code Section 20.480.002, Design Review—Applicability*: Design review is required for all projects that require a building permit that involve construction, reconstruction, rehabilitation, alteration, or other improvements to the exterior of a structure or parking area, except for projects developed in compliance with a previous design review approval.
- *Municipal Code Section 20.480.003, Assignment of Design Review Responsibilities—Planning Commission*: The Planning Commission has design review authority for all projects requiring Planning Commission approval and all new commercial, downtown, employment, mixed-use,

office, and multifamily developments. The Planning Commission shall also consider the Design Review Board's recommendations and shall approve, conditionally approve, or deny the design review application.

- *Municipal Code Section 20.480.006, Design Review Criteria*: When conducting design review, the Design Review Board, Chief Planner, Planning Commission, or City Council shall evaluate applications to ensure that they conform to the policies of the General Plan and any applicable specific plan, are consistent with any other policies or guidelines the City Council may adopt, and satisfy specific criteria outlined in this code, such as those related to a building, structure or signage; parking areas; open space, and pedestrian areas; and electrical and mechanical equipment or works, among other criteria. Ultimately, the code states that a project's design features are reviewed in consideration of achieving a safe, efficient, and harmonious development, and shadow patterns, and that components considered in design review shall include safety.
- *Municipal Code Section 20.480.010, Appeals; Expiration, Extensions, and Modifications*: A decision made by the Chief Planner on a project shall be subject to review by the Planning Commission either on appeal by the applicant or upon motion of the Planning Commission. If the Planning Commission fails to make an order to review the Chief Planner's determination at its next regular meeting after the determination, then the Chief Planner's determination shall be final. In addition, for expirations, extension, and modifications, design review approval is effective and may only be extended or modified as detailed in Chapter 20.450, *Common Procedures*.

4.10.1.2 Significance Criteria

Based on Appendix G of the CEQA Guidelines, the proposed project would have a significant aesthetics impact if it would:

- Have a substantial adverse effect on a scenic vista;
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
- Conflict with applicable zoning and other regulations governing scenic quality; or
- Create a new source of substantial light or glare which would adversely affect daytime or nighttime views in the area.

4.10.1.3 Approach to Analysis

Evaluation of the proposed project is based on aerial imagery from Google Earth and the *List of Eligible and Officially Designated State Scenic Highways*.[1] The proposed project was also evaluated based on the potential impact to scenic vistas defined in the General Plan (i.e., Sign Hill Park and the bayfront). In addition, existing sources of existing visual character and light and glare in the vicinity of the project site were described and applicable regulations were reviewed.

---

[1] California Department of Transportation. 2019. *Scenic Highway System Lists—List of Eligible and Officially Designated State Scenic Highways*. Available: https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways. Accessed: February 27, 2020.

4.10.1.4 Impact Evaluation

Impact AES-1: The proposed project would not have a substantial adverse effect on a scenic vista. (*Less than Significant*)

The project site is not within a locally or state-designated scenic vista. The project site is not on or near a designated vista point. The General Plan has identified Sign Hill Park (located 1 mile west of the project site) and the bayfront (0.2 mile north of the project site) as resources within the City where accessibility and visibility should be improved.

The project site is in a developed urban area consisting of commercial and office uses. San Bruno Mountain, which contains Sign Hill Park, is a prominent visual landmark in South San Francisco. The mountain can be seen from many locations throughout the City, including many portions of the East of 101 Area. There are no designated scenic overlooks of the mountain in the vicinity of the project site. The General Plan specifically states that the "accessibility and visibility of Sign Hill Park" should be improved as part of Policy 5.1-I-9. The proposed project involves construction of a 148-foot-tall, seven-story building, which would partially obscure existing views of Sign Hill Park and San Bruno Mountain as seen from the project site and vicinity. However, existing views of the park and the mountain are partially obscured by existing buildings, trees, and topography. The proposed project would not substantially worsen the existing partially obstructed views of the park and mountain. Furthermore, the areas from which views of the park and the mountain may be blocked by the proposed building are not prominent places where people gather to view the park and the mountain. The General Plan specifically states that the "accessibility and visibility of Sign Hill Park" should be improved as part of an implementing policy. Development of the proposed project would be subject to design review to ensure that development of the project supports General Plan policies. Therefore, effects on existing scenic vistas under the proposed project would ***be less than significant***. No mitigation is required.

Impact AES-2: The proposed project would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State Scenic Highway. (*No Impact*)

U.S. 101 is approximately 0.2 mile west of the project site and this segment of U.S. 101 is not an officially designated or eligible State Scenic Highway.[2] I-280 is the nearest officially designated state scenic highway to the project site. I-280 is approximately 3 miles west of the project site; therefore, the project site is not within the I-280 viewshed.

As such, the proposed project would have ***no impact*** on scenic resources within a state scenic highway. No mitigation is required.

Impact AES-3: The proposed project would not conflict with applicable zoning and other regulations governing scenic quality. (*Less than Significant*)

Project construction would involve demolition work, earthmoving, grading, and tree removal. As a result, construction equipment and vehicles, fencing, construction staging areas, and associated debris would be present and visible on the project site in varying degrees, depending on the construction phase and equipment being used over the duration of project construction

[2] Ibid.

(approximately 18 months). This would temporarily change the visual character of the project site; however, the visual effects of construction activities would be temporary and similar in nature to the visual effects of other types of construction that occurs in the City. Therefore, the project would not conflict with applicable zoning and other regulations governing scenic quality during construction and this impact would be ***less than significant***. No mitigation is required.

The proposed project would include a total of 164 trees, accounting for the 175 existing trees to be removed (including three heritage trees and one protected tree), the 52 existing trees to remain, and the additional 112 trees to be planted. As discussed in Section 4.3, *Biological Resources*, of this draft EIR, the proposed project would comply with the City Municipal Code chapter 13.30 which includes conditions applicable to protected trees. Therefore, the project would not result in adverse aesthetic impacts related to tree or landscape removal. In addition, the proposed project would include approximately 59,800 square feet of planted landscaped areas (not accounting for the proposed biotreatment areas, discussed below) and approximately 53,700 square feet of hardscape landscaped areas, for a total of 58,100 square feet of landscaped areas. For a discussion of potential biological resource impacts associated with proposed tree removal and new landscaping, refer to Section 4.3, *Biological Resources*, of this draft EIR.

The project site is within the Gateway Campus, which is composed of three- to 16-story office and R&D buildings in a heavily urbanized area. The project would increase the height and density of development on the project site. The project site consists of an approximately 97-foot-tall, six-story building at 701 Gateway Boulevard that would remain under the proposed project. The proposed project involves construction of a 148-foot-tall, seven-story building on the same site. The proposed building would be constructed of contemporary materials and detailing, including white, light-blue, and dark-blue vision glass; solid aluminum panels; perforated aluminum panels; and metal railings and columns. Refer to Figure 3-7, Conceptual Elevations (North and South), and Figure 3-8, Conceptual Elevations (East and West), in Chapter 3, *Project Description*, for elevations for the proposed building. As discussed in Section 4.10.5, *Land Use*, of this draft EIR, the proposed project would maintain the existing zoning designation of Zone IV under the Gateway Specific Plan District (GSPD). The existing zoning allows for development at a maximum floor area ratio (FAR) of 1.25, or a maximum of 402,930 total square feet, within the project site. The existing building at 701 Gateway Boulevard is approximately 170,235 square feet. Based on the zoning, 232,695 square feet of unrealized FAR remains available for the project site, and the proposed project would utilize a portion of that unrealized FAR. The total proposed FAR for the site, including both the existing building at 701 Gateway Boulevard and the proposed building at 751 Gateway Boulevard, would be 1.18. From a visual perspective, the increased FAR would not result in a significant aesthetic impact because the proposed project would be within the 1.25 maximum allowable FAR. No substantial change to the existing visual character on the project site or within the surrounding area would occur. In addition, the project, as proposed, is generally consistent with the General Plan (refer to Section 4.10.5, *Land Use,* of this draft EIR). Development within the project site would also be required to conform with applicable design guidelines in the *East of 101 Area Plan,* such as those described above in Section 4.10.1.1, *Regulatory Framework,* and would be subject to the City's design review process, ensuring that the project would not adversely affect the visual quality of the area. Furthermore, the proposed project would be required to comply with the City's standard conditions, which will be attached to the entitlements for the proposed project, including Condition No. 21, which requires screening HVAC equipment from public view, and Condition No. 22, which requires permanent maintenance of facilities (e.g., structures, paving, landscaping, etc.). In addition, the proposed project would be required to comply with any project-specific conditions of approval.

Therefore, the project would not conflict with applicable zoning and other regulations governing scenic quality during operation and this impact would be ***less than significant***. No mitigation is required.

Impact AES-4: The proposed project would not create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area. (*Less than Significant*)

The project site is in an office, R&D, and industrial area with no adjacent residential uses. Residential uses are sensitive to light and glare impacts, particularly from nearby non-residential sources. Existing sources of light and glare in the area are typical of those in the urban environment including, but not limited to, interior and exterior building lights, streetlights, parking lot lights, security lights, vehicular headlights, and reflective building surfaces and windows. The proposed project would increase the active building area within the project site and would increase the amount of nighttime lighting and glare. Specifically, the proposed project would include wayfinding lighting on the project site (e.g., along walkways and driveways, at entrances, in surface parking areas). Outside lighting would be comparable in brightness to ambient lighting in the surrounding area. Increased lighting on the project site, relative to the existing outdoor lighting, would increase overall illumination in the area. Exterior building materials would consist primarily of contemporary materials and detailing, including white, light-blue, and dark-blue vision glass; solid aluminum panels; perforated aluminum panels; and metal railings and columns. However, the proposed project would be consistent with existing office and R&D uses in the vicinity as well as the *East of 101 Area Plan* and would not substantially affect overall ambient light levels in the already-existing urban context of the project site. In addition, the proposed project would be required to comply with the City's standard conditions, which will be attached to the entitlements for the proposed project, including Condition No. 28, which requires compliance with the South San Francisco Municipal Code chapter 20.300.008 (Lighting and Illumination) and requires that there be no objectionable or hazardous illumination of adjacent properties or streets. The proposed project would also be required to comply with any project-specific conditions of approval. Furthermore, the design of the exterior façade of the proposed building would be subject to the City's design review process, ensuring that the project would not create a substantial new source of light or glare in the area surrounding the project site. All project signage would be subject to receipt of a sign permit (as well as design review for signs of 25 square feet or more), including review of any illuminated signs for compliance with the applicable requirements of Chapter 20.360 of the City's Municipal Code governing light, glare, and shielding for illuminated signs. Therefore, the project would not create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area. Given the densely developed nature of the project vicinity, and the fact that light and glare introduced by the proposed project would be negligible relative to existing conditions, the impact would be ***less than significant.*** No mitigation is required.

Impact C-AES-1: The proposed project, in combination with past, present, and reasonably foreseeable future projects, would not result in a significant cumulative impact on aesthetics. (*Less than Significant*)

Aesthetics are dependent upon the location of users, the breadth of the viewshed, and the contiguousness of scenic vistas and views. The cumulative geographic context for aesthetics is the immediate vicinity of the project site (i.e., the parcels adjacent to the project site). The cumulative projects located within approximately 0.5 mile of the project site are described in Section 4.1.5, *Approach to Cumulative Impact Analysis*, of this draft EIR and shown in Figure 4.1-1.

The nearest cumulative project, the project at 475 Eccles Avenue (Cumulative Project No. 16), is located approximately 630 feet east of the project site. The project at 475 Eccles Avenue would involve new office/R&D buildings consistent with the existing character of the surrounding area. The remaining cumulative projects would also involve new office, R&D, and hotel uses that would be consistent with the existing character of the overall surrounding area and the East of 101 Area. Many of the cumulative projects would include visual enhancements of their own, such as new pedestrian and bicycle improvements, as well as open space and landscape improvements. In addition, the cumulative projects would be subject to the same South San Francisco Municipal Code compliance and City design review processes as the project, thereby ensuring that no, or limited, light and glare impacts would result from development. Furthermore, no designated historic districts or neighborhoods are present that would be affected by the development of the cumulative projects. For these reasons, the proposed project, in combination with other past, present, and reasonably foreseeable future projects, would not result in a significant cumulative aesthetics impact. The cumulative impact would be ***less than significant***. No mitigation is required.

4.10.2 Agricultural and Forest Resources

4.10.2.1 Regulatory Framework

There are no federal, state, regional, or local laws, regulations, plans, or policies related to agricultural and forest resources in connection with implementation of the proposed project.

4.10.2.2 Significance Criteria

Based on Appendix G of the CEQA Guidelines, the proposed project would have a significant agricultural and forest resources impact if it would:

- 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;
- Conflict with existing zoning for agricultural use, or a Williamson Act contract;
- Conflict with existing zoning for, or cause rezoning of, forestland (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]).
- Result in a loss of forestland or conversion of forestland to non-forest use; or
- 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 forestland to non-forest use.

4.10.2.3 Approach to Analysis

Evaluation of the proposed project is based on the San Mateo County Important Farmland map generated by the California Department of Conservation Farmland Mapping and Monitoring Program,[3] the San Mateo County Williamson Act Parcels GIS data,[4] the General Plan, and aerial imagery from Google Earth.

4.10.2.4 Impact Evaluation

Impact AG-1: The proposed project would not convert designated Farmland under the Farmland Mapping and Monitoring Program, nor would it conflict with any existing agricultural zoning or a Williamson Act contract, nor would it involve any changes to the environment that would result in the conversion of designated Farmland. (*No Impact*)

The California Department of Conservation, Division of Land Resource Protection, maps important farmland, including Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance, and Grazing Land. Agricultural land is rated according to soil quality and irrigation status; the best quality land is called Prime Farmland. The California Department of Conservation's Farmland Mapping and Monitoring Program identifies the project site as "Urban and Built-up."[5] The project site does not contain any designated Farmland. Thus, the proposed project would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to a non-agricultural use. The project site is in the Gateway Specific Plan Area, which includes a variety of commercial and R&D land uses, and is zoned GSPD, which is not for agricultural use. Thus, the proposed project would not conflict with any agricultural zoning. In addition, no land adjacent to or in the vicinity of the project site is zoned for or used as agriculture. There are no Williamson Act contracts for land within the East of 101 Area.[6] Thus, the proposed project would not conflict with a Williamson Act contract or involve other changes in the existing environment, which, due to their location or nature, could result in the conversion of farmland to non-agricultural use. Based on the analysis above, the proposed project would have ***no impact*** on agricultural resources. No mitigation is required.

---

[3] California Department of Conservation. 2019. *San Mateo County Important Farmland*. Available: https://www.conservation.ca.gov/dlrp/fmmp/Pages/SanMateo.aspx. Accessed: February 18, 2020.

[4] San Mateo County Open GIS Data. 2016. *Williamson Act Parcels*. Available: https://data-smcmaps.opendata.arcgis.com/datasets/williamson-act-parcels?geometry=-122.772%2C37.513%2C-121.905%2C37.704. Accessed: April 24, 2020.

[5] Urban and Built-up land is defined as land with a building density of at least one unit to 1.5 acres or six structures per 10 acres on the 2018 San Mateo County Important Farmland map as well as land used for residential, industrial, and commercial purposes; institutional facilities; cemeteries; airports; golf courses; sanitary landfills; sewage treatment; and water control structures.

[6] The Williamson Act is a California law enacted in 1965 that provides property tax relief to owners of farmland and open space land in exchange for a 10-year agreement that the land will not be developed or converted into another use.

Impact AG-2: The proposed project would not conflict with existing zoning for, or cause rezoning of, forestland, timberland, or timberland zoned Timberland Production, nor would it result in the loss or conversion of forestland to non-forest uses. (*No Impact*)

There is no timberland or timberland zoned Timberland Production on the project site.[7] None of the trees currently growing on or adjacent to the project site are managed for a public benefit, and therefore the project site is not "forestland."[8] Thus, the proposed project would not result in the loss of forest land or the conversion of forest land to non-forest use. Furthermore, the project would not conflict with any existing zoning or forestland or timberland use or involve any changes to the environment that could result in the conversion of forestland or timberland. Thus, there would be ***no impact*** with respect to forest land or timberland. No mitigation is required.

Impact C-AG-1: The proposed project, in combination with past, present, and reasonably foreseeable future projects, would not result in a significant cumulative impact on agricultural or forest resources. (*No Impact*)

The cumulative geographic context for agricultural resources is the immediate vicinity of the project site (i.e., the parcels adjacent to the project site). The cumulative projects located within approximately 0.5 mile of the project site are described in Section 4.1.5, *Approach to Cumulative Impact Analysis*, of this draft EIR and shown in Figure 4.1-1.

The immediate vicinity of the project site is mapped as "Urban and Built Up Land" by the California Department of Conservation. There are no parcels in the East of 101 Area or the Gateway Specific Plan planning area designated as Prime Farmland, Unique Farmland, or Farmland of Statewide or Local Importance, nor are there parcels under Williamson Act contract. There is no timberland or timberland zoned Timberland Production in the East of 101 Area or the Gateway Specific Plan planning area where most of the cumulative projects are located. For these reasons, the proposed project, in combination with other past, present, and reasonably foreseeable future projects, would not result in a significant cumulative agricultural and forest resources impact. There would be ***no cumulative impact*** on agricultural and forest resources. No mitigation is required.

---

7 According to Public Resources Code section 4526 and California Government Code section 51104(g), "timberland" is defined as land, other than that owned by the federal government or designated by the State Board of Forestry and Fire Protection as Experimental Forestland, that is available for and capable of growing a crop of trees of any commercial species to produce lumber and other forest products, including Christmas trees.

8 According to Public Resources Code section 12220[g], "forestland" is land that can support a 10 percent native tree cover of any species, including hardwoods, under natural conditions and allow management of one or more forest resources, including resources with timber, aesthetic, fish and wildlife, biodiversity, water quality, recreational, or other public benefits.

4.10.3 Hazards and Hazardous Materials

4.10.3.1 Regulatory Framework

Federal

Federal Toxic Substances Control Act/Resource Conservation and Recovery Act/Hazardous and Solid Waste Act

The federal Toxic Substances Control Act and the Resource Conservation and Recovery Act (RCRA) established an EPA-administered program to regulate the generation, transport, treatment, storage, and disposal of hazardous waste. The RCRA was amended in 1984 by the Hazardous and Solid Waste Act, which affirmed and extended the "cradle to grave" system of regulating hazardous wastes.

Comprehensive Environmental Response, Compensation, and Liability Act/Superfund Amendments and Reauthorization Act

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as "Superfund," was enacted by Congress on December 11, 1980. This law (42 USC 103) provides broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. CERCLA establishes requirements concerning closed and abandoned hazardous waste sites, provides for liability of persons responsible for releases of hazardous waste at these sites, and establishes a trust fund to provide for cleanup when no responsible party can be identified. CERCLA also enabled revision of the *National Contingency Plan* (NCP). The NCP (CFR title 40, part 300) provides the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, and/or contaminants. The NCP also established the National Priorities List. CERCLA was amended by the Superfund Amendments and Reauthorization Act on October 17, 1986.

Occupational Safety and Health Administration

The Occupational Safety and Health Administration's (OSHA's) mission is to ensure the safety and health of American workers by setting and enforcing standards; providing training, outreach, and education; establishing partnerships; and encouraging continual improvement in workplace safety and health. OSHA establishes and enforces protective standards and reaches out to employers and employees through technical assistance and consultation programs. OSHA standards are listed in 29 CFR 1910.

Toxic Substances Control Act

The Toxic Substances Control Act, which came into law on October 11, 1976, authorized the EPA to secure information on all new and existing chemical substances and control those substances with unreasonable risks related to public health and the environment.

U.S. Department of Transportation Hazardous Materials Regulations (49 CFR 100–185)

The U.S. Department of Transportation regulations cover all aspects of hazardous materials packaging, handling, and transportation. Some of the topics covered include parts 107 (Hazard Materials Program), 130 (Oil Spill Prevention and Response), 172 (Emergency Response), 173 (Packaging Requirements), 174 (Rail Transportation), 176 (Vessel Transportation), 177 (Highway Transportation), 178 (Packaging Specifications), and 180 (Packaging Maintenance).

State

California Environmental Protection Agency

The California Environmental Protection Agency (CalEPA) was created in 1991. It unified California's environmental authority in a single cabinet-level agency and brought the California Air Resources Board, State Water Resources Control Board, Regional Water Quality Control Board (RWQCB), California Department of Resources Recycling and Recovery (CalRecycle), Department of Toxic Substances Control (DTSC), Office of Environmental Health Hazard Assessment, and Department of Pesticide Regulation under one agency. These agencies were placed under the CalEPA "umbrella" for the protection of human health and the environment to ensure the coordinated deployment of state resources. Their mission is to restore, protect, and enhance the environment and ensure public health, environmental quality, and economic vitality.

Department of Toxic Substances Control

DTSC, a department of CalEPA, is the primary agency in California for regulating hazardous waste, cleaning up existing contamination, and finding ways to reduce the amount of hazardous waste produced in California. DTSC regulates hazardous waste primarily under the authority of the federal RCRA and the California Health and Safety Code (primarily division 20, chapters 6.5 through 10.6, and title 22, division 4.5). Other laws that affect hazardous waste are specific to handling, storage, transportation, disposal, treatment, reduction, cleanup, and emergency planning.

USC 65962.5 (commonly referred to as the Cortese List) includes DTSC-listed hazardous waste facilities and sites, Department of Health Services lists of contaminated drinking water wells, sites listed by the State Water Resources Control Board as having underground storage tank leaks or a discharge of hazardous wastes or materials into the water or groundwater, and lists from local regulatory agencies of sites with a known migration of hazardous waste/material.

Hazardous Waste Control Act (section 25100 et seq.)

DTSC is responsible for enforcing the Hazardous Waste Control Act (California Health and Safety Code section 25100 et seq.), a framework under which hazardous wastes are managed in California. The law provides for the development of a state hazardous waste program that administers and implements the provisions of the federal RCRA cradle-to-grave waste management system in California. It also provides for the designation of California-only hazardous waste and development of standards that are equal to or, in some cases, more stringent than federal requirements.

Unified Hazardous Waste and Hazardous Materials Management Regulatory Program

The Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (California Health and Safety Code, chapter 6.11, sections 25404–25404.9) provides authority to the Certified Unified Program Agency. The Certified Unified Program Agency for the project area is the San Mateo County Health.[9]

The Unified Hazardous Waste and Hazardous Materials Management Regulatory Program consolidates, coordinates, and makes consistent the administrative requirements, permits, inspections, and enforcement activities of hazardous materials programs, including the HazMat

[9] San Mateo County Health. 2020. *Certified Unified Program Agency (CUPA)*. Available: https://www.smchealth.org/hazardous-materials-cupa. Accessed: April 27, 2020.

Business Plan Program, California Accidental Release Prevention Program, Underground Storage Tank Program, Aboveground Storage Tank Program, and Hazardous Waste Generator Program, and incident response.

California Code of Regulations, Title 8—Industrial Relations

Occupational safety standards exist in federal and state laws to minimize worker safety risks from both physical and chemical hazards in the workplace. The California Division of Occupational Safety and Health (known as Cal/OSHA) and the federal OSHA are the agencies responsible for ensuring worker safety in the workplace. Cal/OSHA assumes primary responsibility for developing and enforcing standards for safe workplaces and work practices. These standards would apply to construction activities.

California Labor Code (division 5, parts 1, 6, 7, and 7.5)

The California Labor Code is a collection of regulations for the workplace that ensure appropriate training on the use and handling of hazardous materials as well as the operation of equipment and machines that use, store, transport, or dispose of hazardous materials. Division 5, part 1, chapter 2.5, ensures that employees who are in charge of handling hazardous materials are appropriately trained and informed with respect to the materials they handle. Division 5, part 7, ensures that employees who work with volatile flammable liquids are outfitted with appropriate safety gear and clothing.

Regional

County of San Mateo Emergency Operations Plan

The 2015 County of San Mateo Emergency Operations Plan establishes policies and procedures and assigns responsibilities to ensure effective management of emergency response operations within the San Mateo County Operational Area. The emergency management organization in San Mateo County will identify potential threats to life, property and the environment, and develop plans and procedures to protect, prevent and mitigate those assets from potential hazards (e.g., hazardous materials spills).

Comprehensive Airport Land Use Compatibility Plan

State law requires Airport Land Use Commissions (ALUCs) to prepare and adopt an Airport Land Use Compatibility Plan (ALUCP) for each public use and military airport within their jurisdiction. Further, ALUCs are required to review the plans, regulations, and other actions of local agencies and airport operators within each Commission's jurisdiction. SFO is located 2 miles south of the project site. The 2012 Comprehensive Airport Land Use Compatibility Plan prepared for SFO has four primary areas of concern:

- Aircraft Noise Impact Reduction – To reduce the potential number of future airport area residents who could be exposed to noise impacts from airport and aircraft operations.
- Safety of Persons on the Ground and in Aircraft in Flight – To minimize the potential number of future residents and land use occupants exposed to hazards related to aircraft operations and accidents.
- Height Restrictions/Airspace Protection – To protect the navigable airspace around the Airport for the safe and efficient operation of aircraft in flight.

- Overflight Notification – To establish an area within which aircraft flights to and from the Airport occur frequently enough and at a low enough altitude to be noticeable by sensitive residents. Within this area, real estate disclosure notices shall be required, pursuant to state law.

The 2012 SFO ALUCP contains airport/land use compatibility policies and criteria that apply to all land uses except those considered as existing land uses. ALUCs were given authority to: (1) specify how land near airports is to be used, based on safety and noise compatibility considerations; (2) develop height restrictions for new development to protect airspace in the vicinity of the airport; and (3) establish construction standards for new buildings near airports, including sound insulation requirements. As identified in the 2012 SFO ALUCP, the project site is located within the Federal Aviation Regulation Part 77 sphere of influence, which is the boundary established to regulate obstructions to airspace navigation, including building heights.

Local

South San Francisco General Plan

The 1999 General Plan provides a vision for long-range physical and economic development of the City, provides strategies and specific implementing actions, and establishes a basis for judging whether specific development proposals and public projects are consistent with the City's plans and policy standards. The 1999 General Plan provides a vision for long-range physical and economic development of the City, provides strategies and specific implementing actions, and establishes a basis for judging whether specific development proposals and public projects are consistent with the City's plans and policy standards. The General Plan contains a Health and Safety Element, which acknowledges and mitigates the risks posed by hazards (e.g., hazardous materials and waste). The General Plan includes the following policies applicable to hazards and hazardous materials:

- Policy 8.3-G-1: Reduce the generation of solid waste, including hazardous waste, and recycle those materials that are used to slow the filling of local and regional landfills, in accord with the California Integrated Waste Management Act of 1989.
- Policy 8.3-G-2: Minimize the risk to life and property from the generation, storage, and transportation of hazardous materials and waste in South San Francisco. Comply with all applicable regulations and provisions for the storage, use, and handling of hazardous substances, as established by federal (EPA), state (DTSC, RWQCB, Cal/OSHA, CalEPA), and local (County of San Mateo, City of South San Francisco) regulations.
- Policy 8.3-I-2: Continue to maintain hazardous waste regulations in the City's zoning ordinance. The existing zoning ordinance and General Plan prohibits intensive industrial facilities and industries that produce substantial amounts of hazardous waste, prohibits industrial uses involving the permanent storage of hazardous materials, and limits lighter industrial uses that produce hazardous waste, such as auto repair and auto painting businesses, to the Light Industrial land use classification.
- Policy 8.3-I-4: Establish an ordinance specifying routes for transporting hazardous materials. These routes should not pass through residential areas or other sensitive areas. Specific time periods for transport should be established to reduce the impact and accident risk during peak travel periods.
- Policy 8.6-G-1: Use the City's *Emergency Response Plan* as the guide for emergency management in South San Francisco.

4.10.3.2 Significance Criteria

Based on Appendix G of the CEQA Guidelines, the proposed project would have a significant hazards and hazardous materials impact if it would:

- Create a significant hazard for the public or the environment through the routine transport, use, or disposal of hazardous materials;
- Create a significant hazard for the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school;
- Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, create a significant hazard for the public or the environment;
- For a project within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, result in a safety hazard for people residing or working in the project area;
- Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan; or
- Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires.

4.10.3.3 Approach to Analysis

Evaluation of the proposed project is based on the phase I environmental site assessment prepared for the project site, unless otherwise noted.[10] The scope of the phase I environmental site assessment included reviewing and analyzing project site conditions to identify any recognized environmental conditions (RECs). Database information is dynamic and can change over time, including changes in site status and new sites can be added to databases. As database information in the phase I environmental site assessment is from 2017, a supplemental environmental database search was also conducted in 2020 by Environmental Data Resources to support the hazards and hazardous materials analysis.[11]

---

[10] Ramboll Environ US Corporation. 2017. *Phase I Environmental Site Assessment 701 Gateway Boulevard*. Final. 1690006158. South San Francisco, CA. Prepared for: Alexandria Real Estate Equities, Inc.

[11] Environmental Data Resources, Inc. (EDR). 2020. The EDR Radius Map with GeoCheck. Inquiry Number 6007239.2s, dated March 12, 2020.

4.10.3.4 Impact Evaluation

Impact HAZ-1: The proposed project would not create a significant hazard for the public or the environment through the routine transport, use, or disposal of hazardous materials. (*Less than Significant*)

Construction

Project construction would involve routine transport, use, and disposal of hazardous materials such as solvents, paints, oils, grease, and caulking. Such transport, use, and disposal must be compliant with applicable regulations, such as the U.S. Department of Transportation regulations. Although small amounts of solvents, paints, oils, grease, and caulking would be transported, used, and disposed of during the construction phase, these materials are typically used in construction projects and would not represent the transport, use, and disposal of acutely hazardous materials. Therefore, the proposed project would not create a significant hazard for the public or the environment through the routine transport, use, or disposal of hazardous materials during construction and this impact would be ***less than significant**.* No mitigation is required.

Operation

The proposed project would include operation of an office and R&D building. Depending on the nature of the proposed R&D uses, the possibility exists for hazards related to the handling of biomedical wastes and hazardous chemicals to occur. R&D tenants that would handle these types of materials would be required to refer to the state and federal lists of regulated substances available through the San Mateo County Environmental Health Department (SMCEHD). Chemicals on the list pose a threat to public health and safety or the environment because they are highly toxic, flammable, or explosive. If the handling of hazardous materials would be required during R&D uses, the facility would be required to adhere to all applicable state and local regulations, seek consultation with the SMCEHD, and apply for applicable permits. In addition, registration of the materials through the SMCEHD Hazardous Material Business Plan Program would be required to ensure safe and responsible handling. The proposed office uses would involve the use of hazardous chemicals that are typical in office settings (e.g., toners, paints, kitchen and restroom cleaners, other maintenance materials). Landscape maintenance on the project site would require the use a wide variety of commercial products that are formulated with hazardous materials (e.g., fuels, cleaners and degreasers, solvents, paints, lubricants, adhesives, sealers, and pesticides/herbicides). Such materials are considered common and are unlikely to be stored or used in large quantities. Any spills involving these materials would be small and localized and would be cleaned up as they occur.

The City requires that building spaces be designed to handle the intended office and R&D uses, with sprinklers, alarms, vents, and secondary containment structures, in accordance with the guidelines laid out in the City's Fire Code. Compliance with state and local regulations would ensure that buildings are equipped with safety measures including sprinklers, alarms, etc., to minimize potential impacts of the presence of hazardous materials. The City further requires that upon completion of the proposed building, occupancy is not allowed until a final inspection is made by the South San Francisco Fire Department (SSFFD) for conformance of all building systems with the City's Fire Code and National Fire Protection Association requirements. The inspection includes a review of the emergency evacuation plans. Finally, compliance with the California Department of Transportation regulations would ensure that all necessary safety precautions would be taken during transport of hazardous materials during all phases of the project. Therefore, the proposed project would not create a significant hazard for the public or the environment through the routine transport, use, or disposal of hazardous materials during operation and this impact would be ***less than significant***. No mitigation is required.

Impact HAZ-2: The proposed project would not create a significant hazard for the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. (*Less than Significant*)

The following is a summary of the findings of the phase I environmental site assessment:

- Residual heavy metal contamination in soil was identified at the 701 Gateway Boulevard site and characterized as a *controlled REC*[12] in the phase I environmental site assessment. However, because a "no further action" finding (subject to controls) was granted for the site, the controlled REC is not considered to be an ongoing contamination concern at the project site. Additional details (identified in the 2020 EDR) are provided under Homart Development Corporation/Edwards Wire and Rope/Bethlehem Steel in Table 4.10-1.
- No other RECs were identified within the project site.
- Asbestos-containing materials, lead-based paint, mold, and radon were not identified as significant concerns.

The 2020 supplemental database search identified multiple listings associated with the project site, including Solstice Neurosciences on the Facility Index System/Facility Registry System and Emissions Inventory Data databases, Broadway Real Estate Services on the Facility Index System/Facility Registry System database, and Divco West Real Estate Services on the San Mateo County Business Inventory database. The project site was identified in the listings as having a history of hazardous materials handling and being part of a Hazardous Material Business Plan Program in the San Mateo County Business Inventory database and permitted for air emissions by the Bay Area Air Quality Management District in the Emissions Inventory database. No violations or releases are associated with any of the listings within the project site.

The 2020 supplemental database search also identified listings associated with multiple off-site properties. Table 4.10-1 identifies hazardous materials sites within 0.25 mile of the project site with a history of releases.

[12] The American Society for Testing and Materials defines a controlled REC as the result of a *"past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority (e.g., as evidenced by the issuance of a "no further action" letter or equivalent or meeting risk-based criteria established by regulatory authority), with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls (e.g., property use restrictions, activity and use limitations, institutional controls, or engineering controls)…"*

Table 4.10-1. Hazardous Materials Sites within 0.25 Mile of the Project Site

Site	Address	Distance from the Project[1]	Database(s)[2]	Site Status Summary
Gateway of Pacific, Elan Pharmaceutical, Aesculap	1000 Gateway Boulevard	0.03 mile to the NE	CPS-SLIC, CERS, RCRA-LQG, FINDS, ECHO, LUST	*Leaking Underground Storage Tank Site.* Status listed as open and undergoing site assessment activities. Tetrachloroethylene listed as contaminant of concern. Soil and groundwater impacts. Currently undergoing soil vapor extraction. According to a 2017 soil and groundwater management plan, "Based on the analytical results (sample results did not exceed applicable thresholds), site groundwater would very likely be able to be discharge to a sanitary sewer system during construction." Based on a review of the site status, the site is not considered to pose a significant potential impact on the environment.
Homart Development Corporation/ Edwards Wire and Rope/ Bethlehem Steel	480 Industrial Way (address no longer exists) and 801 Gateway Boulevard	0.04 mile to the WNW		*Voluntary Cleanup Site.* Investigation and remediation activities occurred at the Homart property at the intersection of Gateway Boulevard and Oyster Point Boulevard. An unspecified quantity of contaminated soil was removed and the site was certified in November of 1983. Later classified as an operation and maintenance site. Site contaminants included polychlorinated biphenyls (PCBs) and lead in soil and groundwater. After a 1988 investigation, the site was considered a "no further action" site. Although soil contamination remains onsite, the 2017 phase I environmental site assessment considered the site a controlled REC. The site was not considered an ongoing contamination concern (assuming the current land use does not change). Based on a review of the site status, the site is not considered to pose a significant potential impact on the environment.

Site	Address	Distance from the Project[1]	Database(s)[2]	Site Status Summary
U.S. Steel Corporation	105 Oyster Point Boulevard	0.06 mile to the NNE	ENVIROSTOR, SAN MATEO CO. BI, HIST CORTESE, RCRA NONGEN/NLR	*Historical DTSC Site*. Site listed with organic liquid (containing metals), affected soil, and asbestos-containing materials. Based on a review of the site status, the site is not considered to pose a significant potential impact on the environment.
U.S. 101/Oyster Point Boulevard	U.S. 101 at Oyster Point Boulevard	0.11 mile to the WNW	ENVIROSTOR	"*No Further Action" Site*. Lead and total petroleum hydrocarbons above applicable screening levels in the stored soil. The California Department of Transportation, in preparation for construction of the Oyster Point Boulevard overcrossing, removed lead-contaminated soil from a ditch draining to San Francisco Bay. Based on a review of the site status, the site is not considered to pose a significant potential impact on the environment.
Thermo Fisher Scientific	180 Oyster Point Boulevard	0.14 mile to the ENE	LUST, SWEEPS UST, SAN MATEO CO. BI, EMI, HAZNET, CERS, HWTS	*Leaking Underground Storage Tank Site*. The site had gasoline-impacted groundwater. Case closed by San Mateo County Local Oversight Program in 2009. Based on a review of the site status, the site is not considered to pose a significant potential impact on the environment.
Oyster Point (former U.S. Steel facility) – The Cove Property	Cross Oyster Point at U.S. 101	0.16 mile to the NNE	CPS-SLIC, CERS	Site listed as open; undergoing long-term management. Site listed as containing diesel, lead, PCBs, polynuclear aromatic hydrocarbons, waste oil–affected groundwater, sediments, and soils. Contaminated sediments in San Francisco Bay have been remediated/capped. In 2009, the RWQCB adopted Order No. R2-2009-0063, which rescinded Site Cleanup Requirements Order N0. 00-125. Although remediation is complete, the case remains open to address soil management during redevelopment. Based on a review of the site status, the site is not considered to pose a significant potential impact on the environment.

Site	Address	Distance from the Project[1]	Database(s)[2]	Site Status Summary
Federal Express	900 Gateway Boulevard	0.17 mile to the E	LUST, HIST CORTESE, WDS, CERS, SAN MATEO CO. BI, HAZNET, NPDES, CIWQS, HWTS, RCRA-SQG, FINDS, ECHO, RCRA NONGEN/NLR, UST, SWEEPS UST	*Leaking Underground Storage Tank Site*. The site had gasoline-impacted groundwater. Case closed by San Mateo County Local Oversight Program in 2004. Based on a review of the site status, the site is not considered to pose a significant potential impact on the environment.
Malcolm Drilling	200 Oyster Point Boulevard	0.2 mile to the ENE	LUST, CPS-SLIC, EMI, SWEEPS UST, DEED, SAN MATEO CO. BI, CERS	*Leaking Underground Storage Tank Site*. The site featured chromium-affected groundwater. Case closed by San Mateo County Local Oversight Program in 2006. Based on a review of the site status, the site is not considered to pose a significant potential impact on the environment.
Levitz Furniture (former)	900 Dubuque Avenue	0.2 mile to the WNW	CPS-SLIC, CERS	*Cleanup Program Site*. The site had lead, nickel, gasoline, heating oil/fuel oil impacts. Media not disclosed. Case closed by San Mateo County Local Oversight Program in 2018. Based on a review of the site status, the site is not considered to pose a significant potential impact on the environment.
Grand Roebling Property/Tularik	317 Roebling Road	0.2 mile to the S	LUST, CPS-SLIC, RCRA-SQG, SAN MATEO CO. BI	*Leaking Underground Storage Tank Site*. The site featured perchloroethylene-affected groundwater. Case closed by San Mateo County Local Oversight Program in 2019. Based on a review of the site status, the site is not considered to pose a significant potential impact on the environment.

Source: Environmental Data Resources, Inc. (EDR). 2020. The EDR Radius Map with GeoCheck. Inquiry Number 6007239.2s, dated March 12, 2020.

Notes:

1 NE = northeast; WNW = west, northwest; NNE = north, northeast; ENE = east, northeast; E = east; and S = south.

2 CPS-SLIC = Cleanup Program Sites – Spills Leaks Investigations and Cleanups; CERS = California Environmental Reporting System; RCRA-LQG = Resource Conservation and Recovery Act – Large Quantity Generator; RCRA-SQG = RCRA - Small Quantity Generators; LUST = Leaking Underground Fuel Tank Report; ENVIROSTOR = EnviroStor Database; SAN MATEO CO. BI = San Mateo County Business Inventory; SEMS-ARCHIVE = Superfund Enterprise Management System Archive; VCP = Voluntary Cleanup Program Properties; HIST CAL-SITES = Calsites Database; SWEEPS UST = Statewide Environmental Evaluation and Planning System; RCRA NonGen / NLR = RCRA - Non Generators / No Longer Regulated; FINDS: Facility Index System/Facility Registry System; ECHO = Enforcement & Compliance History Information; CA BOND EXP. PLAN = Bond Expenditure Plan; EMI = Emissions Inventory Data; HAZNET = Facility and Manifest Data; HIST CORTESE = Hazardous Waste & Substance Site List; NPDES: NPDES Permits Listing; CIWQS = California Integrated Water Quality System; HWTS = Hazardous Waste Tracking System; and DEED = Deed Restriction Listing.

Development on or near Former Hazardous Materials Handling Facilities

No RECs other than the controlled REC have been identified within the project site. As part of the regulatory controls for the controlled REC, the contaminated area was capped. No construction activity would occur in the portion of the project site impacted by the controlled REC other than landscaping installation. This work would not penetrate the cap. The contractor would conduct verification boring before starting construction to confirm the depth where REC is capped.

In addition, due to environmental conditions (as described in the Site Status Summary column of Table 4.10-1), the proposed project would not have the potential to exacerbate potential risks to the environment associated with previously identified hazardous materials sites within 0.25 mile of the project site. Therefore, potential impacts associated with reasonably foreseeable upset and accident conditions involving releases of hazardous materials into the environment would be ***less than significant***. No mitigation is required.

Hazardous Building Materials

The existing office building at 701 Gateway Boulevard would remain under the proposed project. The proposed project would not include the demolition of any existing buildings and would only require demolition of an existing surface parking lot. Therefore, demolition activities would not likely expose workers and surrounding receptors to asbestos, lead, mercury, or PCBs. In the unlikely event that these hazardous materials are exposed, the handling of PCBs is regulated under 24 CFR and handling of PCBs, asbestos, lead, and mercury is regulated under 22 CCR. With compliance with standard local, state, and federal regulatory requirements, impacts related to the accidental release of hazardous materials during demolition would be ***less than significant***. No mitigation is required.

Contaminated Groundwater

No dewatering would be required during project construction. Therefore, construction activities would not have the potential to result in the release of contaminated groundwater and this impact would be ***less than significant***. No mitigation is required.

Impact HAZ-3: The proposed project would not emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school. (*Less than Significant*)

There are no existing schools within 0.25 mile of the project site. The nearest school is Martin Elementary School, approximately 0.8 mile west of the project site. Two existing day care centers are within 0.25 mile of the project site: a day care center at the One and Two Tower Place Project and the Gateway Child Development Center Peninsula. The day care center at One and Two Tower Place Project is approximately 0.25 mile north of the project site and is part of a baseline project (Cumulative Project No. 6) discussed in Section 4.1.4, *Approach to Baseline Setting*, of this draft EIR and shown in Figure 4.1-1. The Gateway Child Development Center Peninsula is approximately 1,000 feet (0.19 mile) from the main project construction areas and 670 feet (0.13 mile) from the nearest project construction area, which would be at the southern terminus of the site and include repaving and curb work, as well as some landscaping activities. The proposed project would include operation of an office and R&D building. As discussed under Impact HAZ-1, depending on the nature of the proposed R&D uses, the possibility exists for hazardous emissions related to biomedical wastes and hazardous chemicals. The facility would be required to adhere to all applicable state and local regulations, seek consultation with the SMCEHD, and apply for applicable permits. In addition, registration of the materials through the SMCEHD Hazardous Material Business Plan Program would be required to ensure safe and responsible handling. The proposed project would not involve any other uses that would involve hazardous emissions (e.g., heavy industrial uses). Therefore, the project may emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school or day care centers, but would be required to adhere to all applicable state and local regulations and this impact would be ***less than significant***. No mitigation is required.

Impact HAZ-4: The proposed project would not be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, create a significant hazard for the public or the environment. (*Less than Significant*)

As discussed under Impact HAZ-2, the project site is listed on the following databases: Facility Index System/Facility Registry System, Emissions Inventory Data, and the San Mateo County Business Inventory database. The project site was identified in the listings as having a history of hazardous materials handling and being part of a Hazardous Material Business Plan Program in the San Mateo County Business Inventory database and permitted for air emissions by the Bay Area Air Quality Management District in the Emissions Inventory database. However, the project site is not included on the Government Code section 65962.5 hazardous materials sites list (known as the *Cortese* list) and was not identified with a history of releases or violations with potential to impact the project. The project site is located near multiple closed cleanup sites. However, no active cleanup sites are located within the project site or within 0.25 mile of the project site. Nonetheless, as described under Impact HAZ-2, exposure of known or unknown subsurface conditions could occur, but with implementation of standard local, state, and federal regulatory requirements that would ensure the proper handling of potentially hazardous subsurface soils and groundwater, this impact would be ***less than significant***. No mitigation is required.

Impact HAZ-5: The proposed project would not result in a safety hazard or excessive noise for people residing or working in the project area. (*Less than Significant*)

SFO is approximately 2 miles south of the project site. The project site is located within the Federal Aviation Regulation Part 77 sphere of influence and within the boundaries of Airport Influence Area (AIA) A and B of the SFO ALUCP. In general, height limitations and restrictions in the East of 101 Area are defined by the SFO Airport AIA. Development on the project site is limited to 300 feet in height by elevation, according to the 2012 SFO ALUCP,[13] but may be further restricted after notification and consultation with the Federal Aviation Administration (FAA) under CFR part 77.9. The proposed project would involve construction of a 148-foot-tall, seven-story building. After consultation with the FAA, it is expected that the proposed project would be compatible with the SFO ALUCP. The proposed building would be below the established height limits and would not pose a safety hazard or generate excessive noise for people working in the project area. Therefore, this impact would be ***less than significant***. No mitigation is required.

---

[13] City/County Association of Governments of San Mateo County. 2012. *Comprehensive Airport Land Use Compatibility Plan for the Environs of San Francisco International Airport*. Available: https://ccag.ca.gov/wp-content/uploads/2014/10/Consolidated_CCAG_ALUCP_November-20121.pdf. Accessed: March 27, 2020.

Impact HAZ-6: The proposed project would not impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan. (*Less than Significant*)

The project would not include any changes to existing public roadways that provide emergency access to the site or surrounding area. The project would demolish a surface parking lot and construct a seven-story office and R&D building with parking. The existing access to the project site (two driveways on Gateway Boulevard, one driveway from the internal access drive south of the building at 951 Gateway Boulevard, and one driveway on an unnamed street that connects Poletti Way to Gateway Boulevard) would be retained under the proposed project. Emergency vehicle access to the project site would be provided by Gateway Boulevard and the parking lot to be constructed north of the proposed building. In addition, the proposed project would be designed to comply with the California Fire Code and the City Fire Marshal's code requirements that require on site access for emergency vehicles, a standard condition for any new project approval.

During project construction, traffic levels would increase minimally, which is not expected to degrade traffic operations. Furthermore, emergency response access during the construction period would not be impeded significantly. The project would not involve development of a structure that would impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan. No streets would be closed, rerouted, or altered substantially. The 731 net new employees (refer to Section 4.10.7, *Population and Housing,* of this draft EIR) may slightly increase demand during an evacuation. Therefore, the project would not interfere with the County of San Mateo's Emergency Operations Plan or any evacuation route. Adequate access to the project site and surrounding area would be maintained. The City further requires that upon completion of the proposed building, occupancy is not allowed until a final inspection is made by the SSFFD, which includes a review of the emergency evacuation plans. Therefore, the proposed project would not impair implementation of or interfere with an adopted emergency response plan or emergency evacuation plan and this impact would be ***less than significant***. No mitigation is required.

Impact HAZ-7: The proposed project would not expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires. (*No Impact*)

According to the California Department of Forestry and Fire Protection (CAL FIRE), the City, including the project site, is in a non-Very High Fire Hazard Severity Zone (non-VHFHSZ).[14] Because the project site is in a developed urban area with no nearby wildland areas, there would be ***no impact***. No mitigation is required.

Impact C-HAZ-1: The proposed project, in combination with past, present, and reasonably foreseeable future projects, would not result in a significant cumulative impact on hazards and hazardous materials. (*Less than Significant*)

The cumulative geographic context for hazards and hazardous materials is the project site and its immediate vicinity (i.e., the parcels adjacent to the project site). The cumulative projects located within approximately 0.5 mile of the project site are described in Section 4.1.5, *Approach to Cumulative Impact Analysis*, of this draft EIR and shown in Figure 4.1-1.

---

[14] California Department of Forestry and Fire Protection. 2007. *San Mateo County Fire Hazard Severity Zones in SRA.* Available: https://osfm.fire.ca.gov/divisions/wildfire-planning-engineering/wildland-hazards-building-codes/fire-hazard-severity-zones-maps/. Accessed: February 19, 2020.

Cumulative development in the immediate vicinity of the project site would be required to comply with all regulations related to hazardous materials and, thus, the project, in combination with related development, would not result in significant cumulative hazards or hazardous materials impacts. In addition, development of cumulative projects in contaminated areas would require remediation in compliance with state and federal environmental regulations, consequently improving overall environmental quality. For these reasons, the proposed project, in combination with other past, present, and reasonably foreseeable future projects, would not result in a significant cumulative hazards or hazardous materials impact. The cumulative impact would be ***less than significant***. No mitigation is required.

4.10.4 Hydrology and Water Quality

4.10.4.1 Regulatory Framework

Federal

Clean Water Act

Several sections of the Clean Water Act (CWA) pertain to regulating waters of the United States. The CWA is the primary federal law for regulating water quality in the United States and the basis for several state and local laws in the country. Its objective is to reduce or eliminate water pollution in the nation's rivers, streams, lakes, and coastal waters. The CWA regulates discharges of pollutants and sets minimum water quality standards for all waters of the United States. Several mechanisms are used to control domestic, industrial, and agricultural pollution under the CWA.

The EPA is the overarching authority for protecting the quality of waters of the United States. However, the EPA has delegated administration and enforcement of certain aspects of the CWA in California to the State Water Resources Control Board (SWRCB) and the RWQCBs. The State of California has developed a number of water quality laws, rules, and regulations and adopted water quality standards to protect beneficial uses of waters of the state, as required by section 303(d) of the CWA. CWA requirements are addressed through development of a 303(d)/305(b) integrated report, which addresses both an update to the 303(d) list and a 305(b) assessment of statewide water quality. The 2014/2016 *California Integrated Report* was approved by EPA on April 6, 2018.

Executive Order 11988

The Federal Emergency Management Agency (FEMA) is responsible for managing the 100-year floodplain (i.e., areas subject to a 1 percent or greater chance of flooding in any given year). A flood insurance rate map is an official FEMA map that can be used to delineate both Special Flood Hazard Areas (the 100-year floodplain) and Flood Risk Premium Zones in a community. Under Executive Order 11988, FEMA requires local governments that are covered by the National Flood Insurance Program to pass and enforce a floodplain management ordinance that specifies minimum requirements for any construction within the 100-year floodplain. FEMA administers the National Flood Insurance Program, which includes floodplain management as well as flood hazard mapping functions and provides subsidized flood insurance to communities that comply with FEMA regulations to limit development in floodplains.

State

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act) was established and implemented by the SWRCB, the primary state agency with responsibility for protecting the quality of the state's surface and groundwater supplies, or *waters of the state*. Waters of the state are defined more broadly than waters of the United States (i.e., any surface water or groundwater, including saline waters, within the boundaries of the state). This includes waters in both natural and artificial channels. It also includes all surface waters that are not waters of the United States or non-jurisdictional wetlands, which are essentially distinguished by whether they are navigable or have a direct hydrologic surface connection to navigable waters. Non-navigable, isolated, and intrastate waters fall under the jurisdiction of only the Porter-Cologne Act and not the CWA.

The Porter-Cologne Act authorizes the SWRCB to draft state policies regarding water quality. The act requires projects that discharge, or propose to discharge, wastes that could affect water quality to file a Report of Waste Discharge with the appropriate RWQCB. The Porter-Cologne Act also requires the SWRCB or a RWQCB to adopt basin plans for the protection of water quality.

NPDES Permit Requirements

The 1972 amendments to the federal Water Pollution Control Act established the NPDES permit program to control discharges of pollutants from any point source. The 1987 amendments to the CWA created a new section that was devoted to stormwater permitting (section 402). The phase I NPDES stormwater program regulates stormwater discharges from industrial facilities, large- and medium-sized municipal separate storm sewer systems (MS4s) (i.e., those serving more than 100,000 persons), and construction sites that disturb 5 or more acres of land. CWA section 402 mandates permits for municipal stormwater discharges, which are regulated under the NPDES General Permit for MS4s. The discharge of stormwater runoff from the MS4 in San Mateo County is permitted under the San Francisco Bay MRP (Order No. R2-2015-0049; NPDES Permit No. CAS612008), which is discussed further below.

NPDES General Construction Stormwater Permit

Most construction activities that disturb 1 acre of land or more are required to obtain coverage under the NPDES General Permit for Construction Activities (Construction General Permit). The SWRCB has issued a statewide Construction General Permit (Order No. 2009-0009-DWQ, NPDES No. CAR000002, as amended by 2010-0014-DWQ and 2012-0006-DWQ). Construction activities subject to the Construction General Permit include clearing, grading, and disturbances to the ground, such as stockpiling or excavation, that result in soil disturbances of at least 1 acre of total land area. The Construction General Permit requires the applicant to file a notice of intent to discharge stormwater and prepare and implement the SWPPP, which includes a site map and a description of proposed construction activities, along with a demonstration of compliance with relevant local ordinances and regulations, and an overview of the BMPs that would be implemented to prevent soil erosion and discharges of other construction-related pollutants that could contaminate nearby water resources.

Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act of 2014 (SGMA) is a comprehensive three-bill package that Governor Jerry Brown signed into California state law in September 2014. The Sustainable Groundwater Management Act provides a framework for sustainable management of groundwater supplies by local authorities, with a limited role for state intervention only if necessary to protect the resource. The plan is intended to ensure a reliable groundwater water supply for California for years to come. SGMA requires the formation of local Groundwater Sustainability Agencies (GSA), which are required to adopt groundwater sustainability plans (GSPs) to manage the sustainability of groundwater basins. The adoption of a GSP is required for all high- and medium-priority basins as identified by DWR or submit an alternative to a GSP. SGMA also requires governments and water agencies of high and medium priority basins to halt overdraft and bring groundwater basins into balanced levels of pumping and recharge.

California Safe Drinking Water Act

The California Safe Drinking Water Act, requires the State Water Resources Control Board to administer provisions relating to the regulation of drinking water to protect public health, including, but not limited to, conducting research, studies, and demonstration programs relating to the provision of a dependable, safe supply of drinking water, enforcing the federal Safe Drinking Water Act, adopting implementing regulations, and conducting studies and investigations to assess the quality of water in private domestic water supplies. Under the act, the implementing regulations are required to include, but are not limited to, monitoring of contaminants and requirements for notifying the public of the quality of the water delivered to customers.

The bill requires the State Water Resources Control Board, on or before July 1, 2020, to adopt a definition of microplastics in drinking water, and on or before July 1, 2021, to adopt a standard methodology to be used in the testing of drinking water for microplastics and requirements for 4 years of testing and reporting of microplastics in drinking water, including public disclosure of those results.

Sea-level Rise and Executive Order S-13-08

In November 2008, Governor Arnold Schwarzenegger issued Executive Order S-13-08. The order indicates that future potential sea level rise associated with climate change may have a substantial effect on coastal development, and provided for the formation of an independent panel to complete a California Sea Level Rise Assessment Report by December 1, 2010. This panel, the California Adaptation Advisory Panel to the State of California, published the required report in November 2010 titled Preparing for the Effects of Climate Change – A Strategy for California. This study noted that the state requested an assessment of defensible sea level projections for the West Coast from the NRC, which was published in 2012.

State Lands and Sea-level Rise and California AB 691

California Assembly Bill (AB) 691 was signed by Governor Brown on October 5, 2013. Effective January 1, 2014, this law prepares for the impacts of sea level rise by requiring holders of public trust lands to assess the impacts and report the results to the State Lands Commission. The law requires a local trustee whose gross public trust revenues average over $250,000 annually between January 1, 2009, and January 1, 2014, to prepare and submit, no later than July 1, 2019, an assessment of how it proposes to address sea level rise. The law requires a local trustee to consider and use relevant information from specified sea level rise reports in preparing the assessment.

California Ocean Protection Council Strategic Plan

The California Ocean Protection Council 2020–2025 Strategic Plan provides a roadmap for the continued progress to protect California's coast and ocean. Collaborative partnerships among state agencies is essential for regulating, funding, and developing policy that guide coastal and ocean actions to achieve the plans goals. The Strategic Plan includes the following policies applicable to sea level rise:

- Objective 1.1 Build Resiliency to Sea-Level Rise, Coastal Storms, Erosion, and Flooding
- Target 1.1.1: Ensure California's coast is resilient to at least 3.5 feet of sea-level rise by 2050, as consistent with the State's Sea-Level Rise Guidance Document as appropriate for a given location or project. This target will be modified periodically based on the best available science and updates to the State's Sea-Level Rise Guidance Document.
- Target 1.1.3: Starting in 2020, provide scientific guidance to partner agencies on the potential impacts of sea-level rise on contaminated sites and how current models could be used to inform site-specific decision making.
- Target 1.1.4: Identify pilot projects across the state that represent a diversity of locations, with variable size and scale, and demonstrate the efficacy of various sea-level rise and extreme event adaptation strategies by 2021 and begin project implementation immediately thereafter, consistent with existing laws and policies.
- Target 1.1.5: Build on existing planning efforts to ensure adoption of a requirement that, at a minimum, all coastal counties will develop a coastal adaptation plan or element and integrate adaptation approaches into existing planning frameworks (e.g., General Plans, Local Coastal Programs, Local Hazard Mitigation Programs) by 2023. Develop templates and minimum standards for adaptation plans or elements by 2021.
- Target 1.1.6: Update the State of California's Sea-Level Rise Guidance in 2023 and every five years thereafter to incorporate best available science and projections, and continually improve integration of changing ocean conditions into California's state government policies, planning, and operations (OPC Lead).

Regional

San Francisco Bay Water Quality Control Plan

San Francisco Bay waters are under the jurisdiction of the San Francisco Bay RWQCB, which established regulatory standards and objectives for water quality in San Francisco Bay in its *Water Quality Control Plan for the San Francisco Bay Basin*, commonly referred to as the Basin Plan. Basin plans are updated and reviewed every three years. They provide the technical basis for determining waste discharge requirements, taking enforcement actions, and evaluating clean water grant proposals. Each RWQCB has region-wide and water body–specific beneficial uses and sets numeric and narrative water quality objectives for several substances and parameters in numerous surface waters in its region. A basin plan must include (1) a statement of beneficial water uses that the RWQCB will protect, (2) the water quality objectives needed to protect the designated beneficial water uses, and (3) strategies to be implemented, with time schedules for achieving the water quality objectives. The San Francisco Bay Basin Plan was last updated in 2017.[15]

[15] San Francisco Bay Regional Water Quality Control Board. 2017. *San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan).* Last updated: May 2017. Available: http://www.waterboards.ca.gov/rwqcb2/basin_planning.shtml. Accessed: February 19, 2020.

Municipal Stormwater Pollution Prevention Program – Municipal Regional Stormwater NPDES Permit

The San Francisco Bay RWQCB issued the most-recent MS4 phase I San Francisco Bay Region Municipal Regional Stormwater NPDES Permit (San Francisco Bay MS4 Permit), No. CAS029718 (Order No. R2-2015-0049 NPDES Permit No. CAS612008, as amended by Order No. R2-2019-0004), on November 19, 2015. Several cities and counties, including the City, are covered as permittees under this permit and required to address the protection of stormwater quality in their jurisdictions through the implementation of stormwater programs. The City is a permittee under the San Francisco Bay MS4 Permit for the discharge of stormwater runoff from the MS4s.

The San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) is a partnership of the City/County Association of Governments of San Mateo County (C/CAG), each incorporated City and town in the county, and the County of San Mateo, which share a common NPDES permit. The project would be required to comply with San Francisco Bay MS4 Permit Provision C.3 Stormwater Technical Guidance. Municipalities apply standard stormwater conditions of approval for projects that receive development permits. The SMCWPPP prepared Provision C.3 Stormwater Technical Guidance to assist projects in designing appropriate post-construction stormwater controls that meet local jurisdictional requirements and the requirements of the San Francisco Bay MS4 Permit. This goal is accomplished through low-impact development (LID) techniques, including infiltration and biotreatment.

San Francisco Bay Conservation and Development Commission

San Francisco Bay Conservation and Development Commission (BCDC) has regulatory responsibility over development in San Francisco Bay and along the Bay's nine-county shoreline. BCDC is guided in its decisions by the McAteer-Petris Act, the San Francisco Bay Plan, and other plans for specific areas around the Bay. BCDC, in partnership with state and federal agencies, is developing a regional sediment management plan that builds on the successful long term management strategy program and seeks to incorporate flood protection, habitat restoration, sand mining and shoreline erosion in the overall management of sediments in the Bay.

Local

South San Francisco General Plan

The 1999 General Plan provides a vision for long-range physical and economic development of the City, provides strategies and specific implementing actions, and establishes a basis for judging whether specific development proposals and public projects are consistent with the City’s plans and policy standards. The General Plan contains an Open Space and Conservation Element, which outlines policies relating to habitat and biological resources, water quality, air quality, greenhouse gas emissions and historic and cultural resources conservation. The General Plan contains a Health and Safety Element, which acknowledges and mitigates the risks posed by hazards (e.g., flooding) and ensures adequate police service. The General Plan includes the following policies applicable to hydrology and water quality:

- Policy 7.2-G-1: Comply with the San Francisco Bay RWQCB regulations and standards to maintain and improve the quality of both surface water and groundwater resources.
- Policy 7.2-G-2: Enhance the quality of surface water resources and prevent their contamination.
- Policy 7.2-G-3: Discourage the use of insecticides, herbicides, or toxic chemical substances within the City.

- Policy 7.2-I-1: Continue working with the San Francisco Bay RWQCB in the implementation of NPDES and continue participation in STOPPP for the protection of surface water and groundwater quality.
- Policy 8.2-G-1: Minimize the risk to life and property from flooding in South San Francisco.
- Policy 8.2-I-1: Continue working with the RWQCB in the implementation of the San Mateo Countywide Stormwater Pollution Prevention Program.
- Policy 8.2-I-2: Use the City's development review process to ensure that proposed development subject to the 100-year flood provides adequate protection from flood hazards.

South San Francisco Municipal Code

Chapter 14.04, Stormwater Management and Discharge Control, is applicable to hydrology and water quality. The purpose of the chapter is to ensure the future health, safety and general welfare of the City of South San Francisco by:

a) Eliminating non-stormwater discharges to the municipal separate storm sewer;

b) Controlling the discharge to municipal separate storm sewers from spills, dumping or disposal of materials other than stormwater;

c) Reducing pollutants in stormwater discharges to the maximum extent practicable.

The intent of Chapter 14.04 is to protect and enhance the water quality of the City's watercourses, water bodies and wetlands in a manner pursuant to and consistent with the Clean Water Act. The chapter includes a section related to low impact development (LID), to reduce runoff and mimic a site's predevelopment hydrology by implementing specific practices to control sources of potential pollution and site design strategies to treat stormwater.

In addition, Chapter 15.56, Flood Damage Prevention, is applicable to hydrology and water quality. The purpose of Chapter 15.56 is to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions.

4.10.4.2 Significance Criteria

Based on Appendix G of the CEQA Guidelines, the proposed project would have a hydrology or water quality impact if it would:

- Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface water or groundwater quality;
- Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project would impede sustainable groundwater management of the basin;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or the addition of impervious surfaces, in a manner that would:
  - Result in substantial erosion or siltation onsite or offsite;
  - Substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite;

- 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 floodflows;

- In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation; or
- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

4.10.4.3 Approach to Analysis

Evaluation of the proposed project is based on the geotechnical investigation prepared for the proposed project, unless otherwise noted.[16] The scope of the geotechnical investigation included a review of available subsurface information and exploration of the subsurface conditions at the site regarding, among other topics, groundwater conditions and hydrologic classification of site soils. Evaluation of the proposed project is also based on the phase I environmental site assessment prepared for the project site, unless otherwise noted.[17] The scope of the phase I environmental site assessment included reviewing and analyzing project site conditions, including surface water hydrology and groundwater at the project site. In addition, evaluation of the proposed project is also based on a review of the Sustainable Groundwater Management Act's Basin Prioritization Dashboard and FEMA's National Flood Hazard data.

4.10.4.4 Impact Evaluation

Impact HY-1: The proposed project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface water or groundwater quality. (*Less than Significant*)

Construction

Project construction activities (e.g., grading, spoil stockpiling, and other earth-disturbing activities) could result in short-term water quality impacts associated with soil erosion and subsequent sediment transport to adjacent properties, roadways, and watercourses through storm drains. A number of different industrial activities have occurred within the project site. Contaminated areas include heavy metal contaminated soil and slag areas, oil shed areas, oil tanks, acid sewage basin, acid sewage pond, and railroad use. The contaminated areas pose a potential risk to water quality during ground disturbing activities. However, contamination that could pose a risk during ground disturbing activities during construction of the proposed project have been addressed through compliance with an approved Soil Management Plan during the redevelopment of the site with the existing office buildings, and remedial action at areas of known contamination. Hazards that pose a risk to water quality have been mitigated, and heavy metal

[16] Langan Engineering and Environmental Services, Inc. 2019. *Geotechnical Investigation, 751 Gateway Boulevard, South San Francisco*, CA 75065-1501. November. Oakland, CA.

[17] Ramboll Environ US Corporation. 2017. Phase I Environmental Site Assessment 701 Gateway Boulevard. Final. 1690006158. South San Francisco, CA. Prepared for: Alexandria Real Estate Equities, Inc.

contamination at these sites have been cleaned.[18] In the event contaminates are found during project construction and demolition activities, the project would comply with NPDES regional permit requirements and Regional Water Board requirements to prevent potential water quality impacts on surface and groundwater.

Other potential water quality impacts include chemical spills into storm drains or groundwater aquifers if proper minimization measures are not implemented. Construction activities must comply with the Construction General Permit, the MRP, and City's General Plan and Municipal Code, which contain standards to ensure that water quality is not degraded. As part of the Construction General Permit, standard erosion control measures and BMPs would be identified in a SWPPP and implemented during construction. Implementation of BMPs would control erosion, restrict non-stormwater discharges, and protect water quality from potential contaminants in stormwater runoff originating from the construction site. BMPs can include the installation of erosion control measures (e.g., silt fences, staked straw bales/wattles, silt/sediment basins or traps), geofabric, sandbag dikes, covers for stockpiles, or storage precautions for outdoor material storage areas. Such BMPs would help to protect surface water and groundwater quality. In addition, the proposed project would be required to comply with the City's standard conditions, which will be attached to the entitlements for the proposed project, including Condition No. 15, which requires a grading permit prior to any onsite grading to minimize water quality impacts associated with mobilization of sediment and erosion. The proposed project would also be required to comply with any project-specific conditions of approval. Therefore, the proposed project would not violate water quality standards or waste discharge requirements during construction and this impact would be ***less than significant***. No mitigation is required.

Operation

Under existing conditions, approximately 19 percent of the project site is covered with pervious surfaces, and 81 percent of the project site is covered with impervious surfaces. Upon project completion, approximately 26 percent of the project site would be covered with pervious surfaces, and 74 percent of the project site would be covered with impervious surfaces, resulting in a slight decrease in impervious cover. Therefore, water quality associated with stormwater runoff would be similar to water quality under existing conditions. In addition, the proposed project would also include three biotreatment areas (e.g., planting areas), one near the entry plaza, one between the lot north of the proposed building and the Gateway pedestrian connection, and one immediately east of the proposed building. The biotreatment areas would total approximately 5,500 square feet and would treat runoff. Stormwater runoff from the project would comply with MRP and SMCWPPP requirements. The project sponsor would be required to submit the SMCWPPP checklist to the City to show compliance with NPDES regional permit requirements. BMPs included in site designs and plans for the project would be reviewed by the City's engineering staff to ensure appropriate and adequate design capacity prior to permit issuance. The San Francisco Bay RWQCB, which has incorporated requirements in the MRP to protect water quality, approved the SMCWPPP, which is in compliance with the municipal stormwater NPDES permit. The City's review and permitting process would ensure that the permit's waste discharge requirements would not be violated by the project. Stormwater would be treated per San Mateo County Provision C.3 requirements prior to discharge to the storm drain system.

---

[18] Environmental Data Resources, Inc. 2020. *751 Gateway Boulevard Project The EDR Radius Map™ Report with GeoCheck.* Inquiry Number: 6007239.2s. March 12.

According to the phase I environmental site assessment prepared for the proposed project, downgradient groundwater contamination has been observed in the vicinity of the project site. However, contamination cleanup included capping with clean soil and asphalt pavement and a deed restriction to prohibit residential and other uses (e.g., hospitals, day-care facilities) at the site to reduce groundwater quality impacts. Therefore, the proposed project would not violate water quality standards or waste discharge requirements during operation and this impact would be ***less than significant***. No mitigation is required.

Impact HY-2: The proposed project would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project would impede sustainable groundwater management of the basin. (*Less than Significant*)

According to the phase I environmental site assessment prepared for the proposed project site, groundwater was encountered at 14 to 24 feet below ground surface. However, to account for seasonal fluctuations, the design groundwater level is approximately 7.5 to 18.5 feet below ground surface. To accommodate utility trenches, the project would require a maximum depth of excavation reaching approximately 9 feet below ground surface. However, no dewatering would be required during project construction. In the event that groundwater is encountered during construction, dewatering would be conducted on a one-time or temporary basis during the construction phase and would not result in a loss of water that would substantially deplete groundwater supplies. Project construction would use water from a metered hydrant. The project site is within the Visitacion Valley Groundwater Basin, which is classified as a very low-priority basin; groundwater in the basin is not a source of supply or recharge. Potable water for the project would be provided via pipe by the California Water Service Company, which purchases most of its water from the San Francisco Public Utilities Commission. Therefore, the proposed project would not use groundwater during construction or operation.

Upon project completion, approximately 26 percent of the project site would be covered with pervious surfaces, and 74 percent of the project site would be covered with impervious surfaces. The proposed project would include approximately 59,800 square feet of planted landscaped areas (not accounting for the proposed biotreatment areas). The proposed project would also include three biotreatment areas (e.g., planting areas), one near the entry plaza, one between the lot north of the proposed building and the Gateway pedestrian connection, and one immediately east of the proposed building. The biotreatment areas would total approximately 5,500 square feet. Under existing conditions, approximately 81 percent of the project site is covered with impervious surfaces, compared to 74 percent after project completion. With implementation of the project, the impervious surface area within the project site would decrease.[19] The proposed biotreatment areas would slow water, allowing it to percolate into the ground and providing increased benefits related to groundwater recharge. The proposed project would increase groundwater recharge potential within the project site. Therefore, the project would not substantially decrease groundwater supplies and would not impede sustainable groundwater management of the Visitacion Valley Groundwater Basin. Therefore, the project's groundwater impact would be ***less than significant.*** No mitigation is required.

[19] BKF. 2020. *701 and 751 Gateway Boulevard, South San Francisco Wet Utilities*. March 5.

Impact HY-3: The proposed project would not substantially alter the existing drainage pattern of the site or area in a manner that would result in substantial erosion or siltation onsite or offsite; substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite; 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 floodflows. (*Less than Significant*)

The project site does not include any existing streams or watercourses that could be altered or diverted. In addition, the project would decrease impervious surfaces by 7 percent on the project site. Therefore, the proposed project would have ***no impact*** related to alteration of existing drainage patters, including alteration of the course of a stream or river or through the addition of impervious surfaces. During construction, stormwater drainage patterns could be temporarily altered. However, the project would implement BMPs, as required in the project SWPPP, to minimize the potential for erosion or siltation in nearby storm drains and temporary changes in drainage patterns during construction. Construction BMPs would capture and infiltrate small amounts of sheetflow into the ground so that offsite runoff from the construction site would not increase, thereby ensuring that drainage patterns would not be significantly altered. Measures required by the Construction General Permit would also limit site runoff during construction; such measures would not alter stormwater drainage patterns. BMPs would be implemented to control construction site runoff, ensure proper stormwater control and treatment, and reduce the discharge of pollution to the storm drain system. Therefore, construction of the project would not substantially alter the existing drainage pattern of the site in a manner that would result in substantial erosion or siltation or increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite.

The existing 18-inch storm pipe on the project site would be relocated to accommodate the location of the proposed building and service and loading yard. New storm drain collector pipes and biotreatment areas (discussed above) would be constructed within the project site to drain to an existing 18-inch storm drain line in Gateway Boulevard. With implementation of the project, the impervious surface area within the project site would decrease by 7 percent.[20] The proposed project would also include three biotreatment areas (e.g., planting areas), one near the entry plaza, one between the lot north of the proposed building and the Gateway pedestrian connection, and one immediately east of the proposed building. The biotreatment areas would total approximately 5,500 square feet.

In response to the NOP comment from the County of San Mateo Public Works Department, this analysis considers the Colma Creek Flood Control Zone. Assessor's parcel number 015-024-290 is outside the Colma Creek Flood Control Zone. Therefore, stormwater runoff from the parcel would not be directed into the City storm drain system, which is ultimately conveyed to the San Mateo County Flood and Sea-Level Rise Resiliency District's flood control channel. A copy of the "as built" drawings would be submited to the San Mateo County Flood and Sea-Level Rise Resiliency District. Assessor's parcel number 015-024-360 is within the Colma Creek Flood Control Zone. Discharge rates from the parcel would not be allowed to exceed existing flow rates with implementation of the proposed project, in compliance with NPDES regional permit requirements. Drainage analyses concerning existing and planned discharge flow rates would be submitted to the City for review and approval. If planned discharge rates exceed existing flow rates, an onsite stormwater detention system would be implemented. The proposed stormwater detention system would be designed to release surface runoff at a rate similar to existing conditions.

---

[20] Ibid.

To meet local, state, and federal requirements regarding water quality treatment as well as flood control, stormwater management facilities would be incorporated into the project. The proposed project would be designed to conserve resources and protect water quality through the management of stormwater runoff with green infrastructure and low impact development (LID). This approach implements engineered controls for stormwater filtering, storage, and flood control. Post-construction water quality treatment measures, as required by Provision C.3 regulations, such as biotreatment planting areas that drain to native soil, will be implemented as part of the project. Stormwater runoff would infiltrate into native soil to recharge groundwater via the proposed biotreatment areas. To reduce water quality impacts from stormwater runoff, a description of site design and source control measures, and stormwater treatment measure sizing calculations would be submitted to the City with the final design plans, as required by the NPDES regional permit. Furthermore, the proposed project would be required to comply with the City's standard conditions, which will be attached to the entitlements for the proposed project, including Condition No. 13, which requires submitting a plan that indicates the location of all storm drains; Condition No. 23, which requires that all parking spaces, driveways, maneuvering aisles, and turn-around areas drain to the sanitary sewer; and Condition No. 24, which requires that onsite stormwater catch basins drain to San Francisco Bay and be labeled accordingly. In addition, the proposed project would be required to comply with any project-specific conditions of approval. Therefore, the project would not exceed the capacity of stormwater drainage systems or provide substantial additional sources of polluted runoff and this impact would be ***less than significant***. No mitigation is required.

Impact HY-4: In flood hazard, tsunami, or seiche zones, the proposed project would not risk release of pollutants due to project inundation. (*Less than Significant*)

The project site is within FEMA Zone X (unshaded), an area of minimal flood hazard, and outside the FEMA 100-year floodplain.[21] Therefore, the project site would not be subject to inundation by a flood.

Tsunamis, or tidal waves, are huge sea waves that are caused by seismic activity or other disturbance of the ocean floor. According to the phase I environmental site assessment prepared for the proposed project, the project site is not within a tsunami inundation area. Therefore, the project site is not subject to inundation by a tsunami.

A seiche is a tide-like rise and drop of the surface of a landlocked body of water (e.g., a lake); its period can vary from a few minutes to several hours. There are no reservoirs adjacent to the project site. In addition, San Francisco Bay is a large and open body of water with no immediate risk of seiche. Therefore, the project site would not be prone to inundation by a seiche.

As discussed under Impact HY-1 and Impact HY-3, stormwater BMPs would be implemented, as required by federal, county, and local policies, to minimize degradation of water quality associated with stormwater runoff or construction-related pollutants. In addition, construction activities would comply with local stormwater ordinances, stormwater requirements established by San Mateo County's MS4 requirements, and regional waste discharge requirements. Project operation would comply with requirements in the MRP to protect water quality as well as the approved SMCWPPP,

---

[21] Federal Emergency Management Agency. 2019. *FEMA Flood Insurance Rate Map*. Map Number 06081C0042F, dated April 5, 2019. Available: https://hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd.

which is in compliance with the municipal stormwater NPDES permit, stormwater requirements established by San Mateo County's MS4 requirements, and regional waste discharge requirements. Post-construction water quality treatment measures, as required by Provision C.3 regulations, such as biotreatment areas, would be implemented as part of the project and would reduce the risk of pollutant release due to project inundation.

Based on the analysis above, impacts related to a release of pollutants due to project inundation in a flood hazard, tsunami, or seiche zone would not occur and this impact would be ***less than significant***. No mitigation is required.

Impact HY-5: The proposed project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. (*Less than Significant*)

Commonly practiced BMPs would be implemented to control construction site runoff and reduce the discharge of pollutants to storm drain systems from stormwater and other nonpoint-source runoff. As part of compliance with permit requirements during ground-disturbing or other construction activities, water quality control measures and BMPs, such as silt fences, fiber rolls, and sediment traps, would be implemented to ensure that water quality standards would be achieved, including the water quality objectives that protect designated beneficial uses of surface and groundwater, as defined in the San Francisco Basin Plan. Releases of construction runoff would comply with the appropriate water quality objectives for the region. The Construction General Permit requires stormwater discharges to be free of pollutants that cause, or contribute to, an exceedance of applicable water quality objectives or water quality standards, including designated beneficial uses. Therefore, the proposed project would not obstruct implementation of a water quality control plan. No dewatering would be required during project construction. In addition, as discussed under Impact HY-2, groundwater would not be used during construction or operation and groundwater recharge would increase with implementation of the proposed project. Based on the analysis above, the project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan and this impact would be ***less than significant***. No mitigation is required.

Impact C-HY-1: The proposed project, in combination with past, present, and reasonably foreseeable future projects, would not result in a significant cumulative impact on hydrology and water quality. (*Less than Significant*)

The geographic context for the analysis of cumulative impacts associated with surface hydrology and water quality is the San Mateo Creek-Frontal San Francisco Bay Estuaries sub-watershed. The context for groundwater hydrology is the Visitacion Valley Groundwater Basin of the larger San Francisco Bay Hydrologic Region. The San Mateo Creek-Frontal San Francisco Bay Estuaries sub-watershed is considered already built out. Consequently, potential growth would most likely occur as redevelopment and not extensive new development on vacant land or open space. The context for cumulative hydrology and water quality impacts is geographic and a function of whether impacts could affect surface water features/watersheds, the City's storm drainage system, or groundwater, each of which has its own physical boundary. The cumulative projects located within approximately 0.5 mile of the project site are described in Section 4.1.5, *Approach to Cumulative Impact Analysis*, of this draft EIR and shown in Figure 4.1-1. Additional cumulative development could occur within the San Mateo Creek-Frontal San Francisco Bay Estuaries sub-watershed and the Visitacion Valley Groundwater Basin.

The cumulative projects in the vicinity of the project site (i.e., within 0.5 mile of the project site) and within the San Mateo Creek-Frontal San Francisco Bay Estuaries sub-watershed would be constructed on infill sites in highly urbanized areas where there is a substantial amount of existing impervious surface area. All new development is required to handle stormwater in a manner that ensures that floodflows will not increase or be redirected to other areas. Similar to the proposed project, all cumulative projects would be required to include post-construction stormwater management features, such as LID measures, to reduce flows to pre-project conditions. The cumulative projects would be subject to the requirements of the San Francisco Bay MS4 Permit, the Construction General Permit, and the City's General Plan and Municipal Code related to protecting water resources. For these reasons, the proposed project, in combination with other past, present, and reasonably foreseeable future projects, would not result in a significant cumulative hydrology and water quality impact. This impact would be ***less than significant***. No mitigation is required.

4.10.5 Land Use

4.10.5.1 Regulatory Framework

Regional

Comprehensive Airport Land Use Compatibility Plan[22]

Refer to Section 4.10.3, *Hazards and Hazardous Materials*, of this draft EIR for a discussion of the 2012 SFO ALUCP. After an ALUC has adopted its ALUCP, affected local governments must update their general plans, specific plans, and land use regulations to be consistent with the ALUCP. Even if the local government has amended its plans to be consistent with the ALUCP, it must still submit proposed new and amended general plans, specific plans, land use ordinances (including rezoning), regulations, and facility master plans to the ALUC for review. The City/County Association of Governments of San Mateo County (C/CAG) ALUC reviews local land use policy actions and administrates consistency review and submits recommendations to the C/CAG Commission.

According to the ALUCP, the Airport Influence Area (AIA), which is the geographic area that is subject to the land use compatibility considerations identified in the ALUCP, is divided into two areas: Area A and Area B. Area A encompasses all of San Mateo County and the incorporated cities within it. Area B roughly follows the noise compatibility and safety zone contours. Consistent with CFR part 77, the ALUCP establishes height restrictions within specific contours of airport facilities throughout Area A and Area B. The project site is located within both Area A and Area B.

The ALUCP identifies specific safety compatibility policies to guide safe development and land use decisions within the airport vicinity. Policy SP-1 identifies Safety Compatibility Zones within certain distances from the airport to minimize potential hazards and improve public safety. These zones range from Zone 1, which is a broad area surrounding airport facilities, to Zone 5, which is the area immediately surrounding airport runways. Policy SP-2 defines incompatible land uses within each Safety Compatibility Zone. In accordance with Policy SP-2, any new development or potentially hazardous uses are considered incompatible land uses within Zone 1, and high-intensity facilities such

[22] City/County Association of Governments of San Mateo County. 2012. Comprehensive Airport Land Use Compatibility for the Environs of San Francisco International Airport. Available: https://ccag.ca.gov/wp-content/uploads/2014/10/Consolidated_CCAG_ALUCP_November-20121.pdf. Accessed: March 27, 2020.

as schools, hospitals, and stadiums, as well as specifically defined hazardous uses, are incompatible land uses within Zone 5. Policy SP-3 identifies the hazardous uses prohibited within Zone 5, including aboveground fuel storage tanks, toxic chemical or fireworks manufacturing facilities, and medical or biological research facilities that use utilize hazardous and/or infectious agents. The project site is not located in any of the Safety Compatibility Zones.

Local

South San Francisco General Plan[23]

The 1999 General Plan provides a vision for long-range physical and economic development of the City, provides strategies and specific implementing actions, and establishes a basis for judging whether specific development proposals and public projects are consistent with the City's plans and policy standards. The 1999 General Plan provides a vision for long-range physical and economic development of the City, provides strategies and specific implementing actions, and establishes a basis for judging whether specific development proposals and public projects are consistent with the City's plans and policy standards. The General Plan contains the following chapters:

- Land Use
- Planning Sub-Areas Element
- Transportation
- Parks, Public Facilities, and Services
- Economic Development
- Open Space and Conservation
- Health and Safety
- Noise

The General Plan chapters above cover six of the seven elements required by state law (land use, open space, conservation, housing, circulation, noise, and safety) and optional elements (Planning Sub-Areas and Economic Development) that address local concerns and regional requirements. The seventh required element is the Housing Element, which is updated on a more regular basis than the General Plan and published under a separate volume.

The General Plan contains a Planning Sub-Areas Element. Policies in this element complement citywide policies included in the Land Use and other elements. Some of these sub-areas have detailed area plans, specific plans, or redevelopment plans. Where appropriate, the General Plan provides guidance as to how these plans may need to be changed in order to conform to the policy direction provided by the General Plan. The sub-areas, 14 in all, were collectively derived from analysis of land use and urban design patterns and existing and needed planning efforts and activities. The project site is located within the East of 101 Sub-Area of the Planning Sub-Areas Element.

[23] City of South San Francisco. 1999. South San Francisco General Plan. Available: https://www.ssf.net/departments/economic-community-development/planning-division/general-plan. Accessed: May 8, 2020.

The General Plan governs the amount and intensity of development within the East of 101 Sub-Area and establishes specific policies and goals for the area, including the project site. The project site is identified in the 1999 General Plan as Business Commercial (BC). Permitted uses in the BC designation include "administrative, financial, business, professional, medical and public offices, research and development facilities, and visitor-oriented and regional commercial activities." As shown in Figure 3-3 in Chapter 3, *Project Description*, of this EIR, designations surrounding the project site are BC and Business Technology Park (BTP).

The General Plan contains a Land Use Element,[24] which provides a framework to guide land use decision making citywide. The General Plan includes the following policies applicable to land use from the Land Use Element:

- Policy 2-G-1: Preserve the scale and character of established neighborhoods, and protect residents from changes in non-residential areas.
- Policy 2-G-2: Maintain a balanced land use program that provides opportunities for continued economic growth, and building intensities that reflect South San Francisco's prominent inner bay location and excellent regional access.
- Policy 2-I-22: Require that all future development conforms with the relevant height, aircraft noise, and safety policies and compatibility criteria contained in the most recently adopted version of the San Mateo County Comprehensive Airport Land Use Plan for the environs of San Francisco International Airport. (Amended by Resolution 19-2010, adopted February 10, 2010)

The General Plan contains a Planning Sub-Areas Element, which establishes policies specific to individual planning sub-areas in the City. The General Plan includes the following policies applicable to land use from the Planning Sub-Areas Element:

- Policy 3.5-G-3: Promote campus-style biotechnology, high-technology, and research and development uses.
- Policy 3.5-I-4: Unless otherwise stipulated in a specific plan, allow building heights in the East of 101 area to the maximum limits permissible under Federal Aviation Regulations Part 77.
- Policy 3.5-I-5: Do not vary permitted maximum development intensities based on lot-size.
- Policy 3.5-I-7: Prepare signage and streetscape plan for the areas designated as Business Commercial and Business and Technology Park on the General Plan Diagram, treating the entire area as one large campus, with unified signage and orchestrated streetscapes that make wayfinding easy and pleasant.
- Policy 3.5-I-8: Encourage the development of employee-serving amenities with restaurants, cafes, support commercial establishments such as dry-cleaners, to meet the needs of the employees in the East of 101 area. Such uses could be located in independent centers or integrated into office parks [o]r technology campuses.
- Policy 3.5-I-11: Do not permit any new warehousing and distribution north of East Grand Avenue or in areas designated Business Commercial.

[24] City of South San Francisco. 1999. *City of South San Francisco General Plan. Land Use Element*. Available: https://www.ssf.net/home/showdocument?id=15526. Accessed: May 8, 2020.

The General Plan contains a Transportation Element, which includes policies, programs, and standards to enhance capacity and provide new linkages. The General Plan includes the following policies applicable to land use from the Transportation Element:

- Policy 4.2-G-13: Integrate Complete Streets infrastructure and design features into street design and construction to create safe and inviting environments for people to walk, bicycle, and use public transportation. (Amended by Resolution 136-2014, adopted December 10, 2014)
- Policy 4.2-G-14: Make Complete Streets practice a routine part of South San Francisco's everyday operations. (Amended by Resolution 136-2014, adopted December 10, 2014)

The base maximum permitted FAR in the BC land use designation is 0.5, but increases may be permitted up to a total FAR of 1.0 for uses such as R&D facilities, or for development meeting specific TDM, off-site improvement, or specific design standards. In addition, the General Plan provides that the zoning ordinance can provide specific exceptions to FAR limitations for uses with low employment densities.

Other applicable General Plan policies are discussed in their respective sections of this draft EIR.

The 1999 General Plan is currently being updated as part of the *Shape SSF 2040 General Plan*.[25] The 1999 General Plan remains active until completion and adoption of the new general plan.

East of 101 Area Plan[26]

The *East of 101 Area Plan*, which was adopted in 1994 and most recently amended in 2016, sets forth specific land use policies for the East of 101 Area. The City interprets the *East of 101 Area Plan* as a design-level document. Applicable policies from the East of 101 Area Plan Land Use Element are as follows:

- Policy LU-8a: Uses allowed in the Gateway Specific Plan Area shall be those specified in the Gateway Specific Plan.
- Policy LU-8b: The maximum allowed Floor Area Ratio in the Gateway Specific Plan Area shall be that specified in the Gateway Specific Plan.
- Policy IM-5: The Gateway Specific Plan is not affected by the land use regulations of the East of 101 Area Plan. Developments on the Gateway site should conform to other policies of this plan including the Design Guidelines in the Design Element and shall be subjected to City design review. In the event of a conflict between this Area Plan and the Gateway Specific Plan the Gateway Specific Plan will prevail.

Per Policy IM-5, the *Gateway Specific Plan* is not affected by the land use regulations of the *East of 101 Area Plan*. Therefore, the policies in the General Plan are the guiding policies and supersede all Land Use Element policies set forth in Chapter 4 of the *East of 101 Area Plan*.

Gateway Specific Plan

The Gateway Specific Plan covers the portion of the East of 101 Area Plan from east of the Caltrain tracks to the eastern boundary of the parcels along the east side of Gateway Boulevard and the area between Oyster Point Boulevard and Grand Avenue on the northern and southern boundaries. The

---

25 City of South San Francisco. 2020. Shape SSF 2040 General Plan. Available: https://shapessf.com/. Accessed: May 8, 2020.

26 City of South San Francisco. 1994. East of 101 Area Plan. Prepared by Brady and Associates. Available: https://www.ssf.net/home/showdocument?id=508. Accessed: May 8, 2020.

Specific Plan is "intended to provide for various commercial and research and development land uses integrated by consistent development standards. Office for professional or business purposes is permitted on all parcels within the Plan Area. Research and development is permitted on Parcels A and F. The project site is Parcel F. A FAR of up to 1.25 is permitted in the Gateway Specific Plan area. Buildings in the Specific Plan area may not exceed 250 feet in height.

South San Francisco Zoning Ordinance[27]

The City of South San Francisco Zoning provides a means by which the City can implement its General Plan. As shown in Figure 3-3 in Chapter 3, *Project Description*, of this EIR, the project site is zoned as Gateway Specific Plan District (GSPD). The GSPD is divided into five individual zones with specifically defined permitted land uses. The project area is within Zone IV. Permitted uses within Zone IV include office, research and development, personal service, and retail sales. The maximum permitted FAR in the GSPD is 1.25. Buildings in the GSPD may have a maximum height of 250 feet.

Climate Action Plan[28]

The Climate Action Plan (CAP), adopted in 2014 and discussed in greater detail in Section 4.7, *Greenhouse Gas Emissions*, of this draft EIR, includes goals, policies, and strategies to reduce the City's greenhouse gas (GHG) emissions, in compliance with Assembly Bill (AB) 32 and Senate Bill (SB) 375. GHG reduction strategies identified in the CAP include a development checklist to identify applicable plan measures for discretionary projects. Measures identified in the plan, which include bike-share programs or facilities for employees, renewable energy feasibility, Leadership in Energy and Environmental Design (LEED) certification, and more, can be considered mandatory conditions of approval or may be adopted as mitigation.

The City's CAP is currently being updated, as part of the General Plan Update. The 2014 CAP remains active until completion and adoption of the new CAP.

4.10.5.2 Significance Criteria

Based on Appendix G of the CEQA Guidelines, the proposed project would have a significant land use impact if it would:

- Physically divide an established community, or
- Result in 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.

4.10.5.3 Approach to Analysis

Evaluation of the proposed project is based on a review of the applicable land use plans and policies described in the *Regulatory Framework* section, above.

A project that involves a change or intensification in land use would not be considered to have a significant impact related to the topic of Land Use and Planning unless the project would physically divide an established community.

---

[27] City of South San Francisco. 2020. South San Francisco Municipal Code. Title 20: Zoning. Available: http://qcode.us/codes/southsanfrancisco/view.php?topic=20. Accessed: May 8, 2020.

[28] City of South San Francisco. 2014. City of South San Francisco Climate Action Plan. Prepared by PMC. Available: https://www.ssf.net/home/showdocument?id=5640. Accessed: May 8, 2020.

Conflicts with existing plans and policies do not, in themselves, indicate a significant environmental effect related to the topic of land use and planning within the meaning of CEQA, unless the project substantially conflicts with a land use plan/policy that was adopted for the purpose of avoiding or mitigating an environmental effect. The focus of the analysis under Impact LU-2 is on the proposed project's potential conflicts with applicable land use plans and policies.

To the extent that physical environmental impacts may result from such conflicts, the EIR discloses and analyzes these physical impacts under the specific environmental topic sections in Chapter 4, *Environmental Setting, Impacts, and Mitigation,* of this draft EIR. Impacts resulting from a change or intensification of employment on the project site are embodied in environmental impacts related to the capacity of existing facilities and services to adequately serve the area, such as those described in Transportation and Circulation, Population and Housing, Public Services, Recreation, and Utilities and Service Systems. Physical impacts of construction and/or operation of the proposed project on the environment are embodied in physical impacts related to environmental topics such as Cultural Resources, Noise, Air Quality, Greenhouse Gas Emissions, Hydrology and Water Quality, and Hazards and Hazardous Materials, Energy, and Tribal Cultural Resources.

4.10.5.4 Impact Evaluation

Impact LU-1: The proposed project would not physically divide an established community. (*Less than Significant*)

The project site consists of a six-story, approximately 170,235-square-foot office building at 701 Gateway Boulevard and surface parking lots. The project site is in an area referred to as the Gateway Campus. The project site is bounded by a commercial and office building (901 Gateway Boulevard) and a surface parking lot to the north, Gateway Boulevard to the east, a surface parking lot to the south, and commercial and office buildings to the west. The proposed project would not introduce new uses to the project vicinity in a manner that would physically divide the existing uses.

A pedestrian walkway, the Gateway pedestrian connection, would be constructed along Gateway Boulevard in the portion of the project site. The approximately 470-foot landscaped walkway would run parallel to the sidewalk and would connect pedestrians from the northern portion of the project site to the proposed building. In addition, pedestrian walkways would be constructed along the existing internal access drive to connect the proposed building to the rest of the Gateway Campus. The proposed project would also include a widened sidewalk and landscaping on the west side of Gateway Boulevard along the project frontage. The proposed pedestrian walkways would improve accessibility between the project site and surrounding uses, and would not create a physical barrier between existing uses. Therefore, the proposed project would not physically divide an established community and this impact would be ***less than significant***. No mitigation is required.

Impact LU-2: The proposed project would not result in 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. (*Less than Significant*)

Comprehensive Airport Land Use Compatibility Plan (ALUCP)

The project site is located within both Airport Influence Areas A and B. However, according to the 2012 SFO ALUCP, the project site is not located within the Community Noise Equivalent Level 65 decibel noise contour[29] or any safety zones.[30] In general, height limitations and restrictions in the East of 101 Area are defined by the SFO Airport Influence Area (AIA). Development on the project site is limited to a height of 300 feet, according to the 2012 SFO ALUCP,[31] but may be further restricted after notification and consultation with the FAA under CFR part 77.9. In addition, as noted above, the Gateway Specific Plan and GSPD limit building heights to 250 feet. The proposed project would involve construction of a 148-foot-tall, seven-story building. It is expected that the proposed project would be compatible with the height restrictions identified in the SFO ALUCP pursuant to consultation with the FAA. Under federal law, the project sponsor is required to comply with all notifications and other requirements described in 14 CFR Part 77. The project sponsor would be required to file Form 7460-1, Notice of Proposed Construction or Alteration, with the FAA to determine whether the project would constitute a hazard to air navigation, and if any airspace safety design features (e.g., lighting) would be necessary. The project site is not located in a Safety Compatibility Zone;[32] Policies SP-1, SP-2, and SP-3 are not applicable to the proposed project. Therefore, the project would be generally consistent with the SFO ALUCP. Refer to Section 4.8, *Noise and Vibration*, of this draft EIR, for an analysis of the project's consistency with SFO ALUCP noise policies.

South San Francisco General Plan

The South San Francisco General Plan Land Use Element identifies policies intended to shape future development within the City and its respective planning areas and districts.

As discussed under Impact AES-3, no substantial change to the existing visual character on the project site or within the surrounding area would occur under the proposed project. As discussed above, the project would be generally consistent with the SFO ALUCP. Therefore, the proposed project would not conflict with Land Use Element Policies 2-G-1, 2-G-2, and 2-I-22.

The proposed project would involve new office and R&D uses under the existing BC land use designation. The total proposed FAR for the site, including both the existing building at 701 Gateway Boulevard and the proposed building at 751 Gateway Boulevard, would be 1.18, which reflects the City's prominent inner bay location and regional access. The base maximum permitted FAR in the BC land use designation is 0.5, but increases may be permitted up to a total FAR of 1.0 for uses such as R&D facilities, or for development meeting specific TDM, off-site improvement, or specific design standards. In addition, the General Plan provides that the zoning ordinance can provide specific exceptions to FAR limitations for uses with low employment densities. A maximum FAR of 1.25 is permitted in the GSPD. The proposed project is consistent with previous and ongoing expansion of

---

29 Exhibit IV-5, *Noise Compatibility Zones* in the SFO ALUCP.

30 Exhibit IV-2, Airport Influence Area B – Land Use Policy Action/Project Referral Area in the SFO ALUCP.

31 City/County Association of Governments of San Mateo County. 2012. *Comprehensive Airport Land Use Compatibility Plan for the Environs of San Francisco International Airport*. Available: https://ccag.ca.gov/wp-content/uploads/2014/10/Consolidated_CCAG_ALUCP_November-20121.pdf. Accessed: March 27, 2020.

32 Exhibit IV-8, *Safety Compatibility Zones in the Cities of South San Francisco and San Bruno* in the SFO ALUCP.

R&D uses in the East of 101 Area, including the Gateway Campus as well as other biotechnology campus sites. In addition, the proposed project would provide employee-serving retail amenities, including a café and fitness center. Signage would be included at site entrances, along walkways, and in parking lots, consistent with the signage throughout the Gateway Campus. Similarly, the project would include streetscape improvements that would complement the existing streetscape design of the Gateway Campus. In addition, the proposed project would not construct new warehousing or distribution uses. Therefore, the proposed project would not conflict with Planning Sub-Areas Element Policies 3.5-G-3, 3.5-1-5, 3.5-I-7, 3.5-I-8, or 3.5-I-11.

As described in Section 4.9, *Transportation and Circulation*, of this draft EIR, Transportation Element Policy 4.2-G-13 directs the City to strive to maintain Level of Service (LOS) D or better on arterial and collector streets, at all intersections, and on principal arterials in the Congestion Management Program (CMP) during peak hours. Nonetheless, Transportation Element Policy 4.2-G-14 permits the City to accept LOS E or F after finding that: (1) there is no practical and feasible way to mitigate the lower LOS; and (2) the uses resulting in the lower LOS are of clear, overall public benefit. Senate Bill 743 amended CEQA to establish that automobile delay as described solely by level of service shall not be considered a significant impact on the environment. On June 10, 2020 the City adopted a vehicle miles traveled (VMT) threshold in accordance with the Office of Planning and Research's guidance in implementing Senate Bill 743; the threshold is effective July 1, 2020. Thus, for CEQA purposes, LOS is no longer a threshold and this analysis considers the appropriate VMT threshold. Therefore, Policies 4.2-G-13 and 4.2-G-14 are not applicable to the CEQA analysis of the proposed project. A discussion of the project's VMT impacts, among other transportation impacts, is provided below.

As described in Section 4.9, *Transportation and Circulation*, the project would generate approximately 16.2 home-based work (HBW) VMT per employee under existing conditions, which is greater than the regional average total of 14.2 HBW VMT per employee and the per-employee significance threshold of 11.8 HBW VMT. First- and last-mile transit connections and active transportation improvements would likely yield the greatest project VMT reductions. Mitigation Measure TR-1, First- and Last-mile Strategies, would support and enhance the effectiveness of the project's TDM program strategies. Mitigation Measure TR-1 would be unlikely to substantially reduce HBW VMT per-employee, but would aid in reducing project auto travel demand. In addition, implementation of Mitigation Measure TR-1 would improve pedestrian connections with existing and/or new public shuttle stops and enable the project to limit travel time effects on existing shuttle routes by eliminating additional route divisions. Therefore, the project would not produce a detrimental impact to local transit or shuttle service, nor would it conflict with adopted plans and programs. Project vehicle trips would not exceed ramp storage capacities nor would the trips interfere with the freeway mainline, specifically at the U.S. 101 southbound off-ramp at Oyster Point Boulevard and U.S. 101 northbound off-ramps at East Grand Avenue and Dubuque Avenue, and therefore, the project would have a less than significant impact on freeway ramp queuing. Furthermore, the project site and proposed building would be designed to ensure that emergency vehicles would have full access to the project site to provide adequate emergency access. Therefore, the proposed project would not conflict with transportation-related land use policies adopted for the purpose of mitigating an environmental effect.

Based on the analysis above, the project would be generally consistent with the General Plan.

East of 101 Area Plan

The *East of 101 Area Plan* establishes specific land use policies for the East of 101 Area, inclusive of the Gateway Specific Plan area. The proposed project is consistent with previous and ongoing expansion of R&D uses in the East of 101 Area. As mentioned above, per Policy IM-5, the *Gateway Specific Plan* is not affected by the land use regulations of the *East of 101 Area Plan*. Therefore, the policies set forth in the General Plan are the guiding policies and supersede all Land Use Element policies set forth in Chapter 4 of the *East of 101 Area Plan*.

The project site is designated as Gateway Specific Plan Area in the *East of 101 Area Plan*.[33] The City interprets the *East of 101 Area Plan* as a design-level document. Development standards and density determinations, including FAR, are established in the General Plan, which was updated after the adoption of, and takes precedence over, the *East of 101 Area Plan*. Moreover, per Policy IM-5, when *East of 101 Area Plan* policies are in conflict with or inconsistent with the General Plan, the General Plan policies supersede requirements outlined in the *East of 101 Area Plan*. Policies from the *East of 101 Area Plan* that are applicable to land use are discussed in *Regulatory Framework*, above.

The proposed project would maintain the existing zoning designation of Zone IV under the GSPD. Based on the zoning, 232,695 square feet of unrealized FAR remains available for the project site, and the proposed project would utilize a portion of that unrealized FAR. The proposed total FAR for the site, including both the existing building at 701 Gateway Boulevard and the proposed building at 751 Gateway Boulevard, would be 1.18. Therefore, the proposed project would not conflict with Policy LU-8a or Policy LU-8b.

The proposed project site plan (refer to Figure 3-4 in Chapter 3, *Project Description*, of this draft EIR) was designed in accordance with the applicable design guidelines in the *East of 101 Area Plan*. The guidelines are interpreted during the design review process, which would involve iterative revisions up until project approval. City staff are responsible for determining final consistency under that process, and the project is subject to Design Review by the City's Design Review Board and Planning Commission. No substantive conflicts have been identified for the proposed project. Based on the analysis above, the project would be generally consistent with the *East of Area 101 Area Plan* and would not result in a significant impact on the environment.

South San Francisco Zoning Ordinance

The South San Francisco Zoning Ordinance identifies the project site as Gateway Specific Plan District (GSPD). The GSPD is divided into five individual zones with specifically defined permitted land uses. The project area is within Zone IV. Permitted uses within Zone IV include office, research and development, personal service, and retail sales. The maximum permitted FAR in the GSPD is 1.25. Buildings in the GSPD may have a maximum height of 250 feet. The project proposes office and R&D uses. The total proposed FAR for the site, including both the existing building at 701 Gateway Boulevard and the proposed building at 751 Gateway Boulevard, would be 1.18. The project would be 148 feet in height. In addition, the project would require a Conditional Use Permit for a parking reduction. Because the project would be consistent with land uses permitted under the GSPD zoning district and there would be no FAR or height exceedances, the project would be consistent with the Zoning Ordinance.

[33] The land use entitlements of the Gateway Specific Plan are not affected by the *East of 101 Area Plan* and supersede any standards or entitlements set forth in the *East of 101 Area Plan*. However, development within the project site would be required to conform with other policies of the *East of 101 Area Plan*, such as design guidelines.

Climate Action Plan

The proposed project would include a flexible TDM plan, which would include a range of required and optional alternative transportation-related requirements (e.g., carpool and vanpool ride-matching services, showers and clothes lockers, shuttle program, short- and long-term bicycle parking, etc.). The proposed project would also include payment of the City's East of 101 traffic impact fee. In addition, the project would be designed to meet LEED Gold certification as well as International WELL and Fitwel Building Institute Standards. The proposed project would include construction of rooftop solar photovoltaic panel–ready connectivity to allow for the potential future installation of solar panels. The project sponsor, in coordination with City staff, would perform ongoing review and identification of applicable CAP Measures for New Development, or for Additions, Alterations, and Tenant Improvements, to be incorporated into the proposed project as project features, mitigation of environmental effects, or mandatory conditions of approval commensurate with the project's intensity of use and site-specific conditions. Therefore, the proposed project would be consistent with the CAP. In addition, as previously discussed, the City's CAP is currently being updated. The 2014 CAP remains active until completion and adoption of the new CAP.

Conclusion

The proposed project would not conflict with land uses plans and policies such that a substantial adverse physical change in the environment related to land use would result. For this reason, the proposed project would have a ***less-than-significant*** impact related to conflict with a land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. No mitigation is required.

Potential conflicts with applicable policies will continue to be analyzed and considered as part of the review of entitlements applications required for the proposed project independent of environmental review under CEQA. They also will be considered by the decision makers during their deliberations on the merits of the proposed project and as part of their actions to approve, modify, or disapprove the proposed project.

Impact C-LU-1: The proposed project, in combination with past, present, and reasonably foreseeable future projects, would not result in a significant cumulative impact on land use. (*Less than Significant*)

The cumulative geographic context for land use is the immediate vicinity of the project site (i.e., the parcels adjacent to the project site). The cumulative projects located within approximately 0.5 mile of the project site are described in Section 4.1.5, *Approach to Cumulative Impact Analysis*, of this draft EIR and shown in Figure 4.1-1.

The nearest cumulative project, the project at 475 Eccles Avenue (Cumulative Project No. 16), is located approximately 630 feet east of the project site. The project at 475 Eccles Avenue would involve new office/R&D buildings that would be located on an infill site surrounded by office/R&D uses. The remaining cumulative projects would also involve new office, R&D, and hotel uses. In addition, two cumulative projects (Bicycle Master Plan [Cumulative Project No. 23] and Mobility 2020 - East of 101 Transportation Plan [Cumulative Project No. 24]) would make improvements and additions to existing bicycle, pedestrian, and/or transit networks. Conflicts with existing plans and policies do not, in themselves, indicate a significant environmental effect related to the topic of land use and planning within the meaning of CEQA, unless the project substantially conflicts with a land use plan/policy that was adopted for the purpose of avoiding or mitigating an environmental effect. In addition, cumulative projects in the vicinity of the project site would be constructed on infill sites and would not divide an established community. Rather, consistent with current urban design practice in the City, designs would aim to enhance connectivity. For these reasons, the proposed project, in combination with other past, present, and reasonably foreseeable future projects, would not result in a significant cumulative land use impact. The cumulative impact would be ***less than significant***. No mitigation is required.

4.10.6 Mineral Resources

4.10.6.1 Regulatory Framework

There are no federal, state, regional, or local laws, regulations, plans, or policies related to mineral resources with respect to implementation of the proposed project.

4.10.6.2 Significance Criteria

Based on Appendix G of the CEQA Guidelines, the proposed project would have a significant mineral resources impact if it would:

- 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, or
- Result in the loss of availability of a locally important mineral resource recovery site delineated in a local general plan, specific plan, or other land use plan.

4.10.6.3 Approach to Analysis

Evaluation of the proposed project is based on a review of the California Department of Conservation, Division of Mines and Geology, Mineral Lands Classification System, in accordance with the Surface Mining and Reclamation Act of 1975.[34]

4.10.6.4 Impact Evaluation

Impact MIN-1: The proposed project would not 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 and/or a locally important mineral resource recovery site delineated in a local general plan, specific plan, or other land use plan. (*No Impact*)

The project site is in an area of the City that has been zoned by the state as Mineral Resource Zone 1 (MRZ-1), an area where no significant mineral deposits are present and little likelihood exists for their presence.[35] The area surrounding the project site is not known to support significant mineral resources of any type, and no mineral resources are currently being extracted in the City. The list of mines from the Office of Mine Reclamation (the AB 3098 List), which lists mines that are regulated under the Surface Mining and Reclamation Act, does not include any mines that are within the City.[36] In addition, the project site has not been designated as a locally important mineral resource recovery site in the General Plan, any specific plan, or other land use plan.

---

[34] California Department of Conservation. 2015. *Surface Mining and Reclamation Act (SMARA) Mineral Lands Classification (MLC) Data Portal Website*. Available: https://maps.conservation.ca.gov/cgs/informationwarehouse/index.html?map=mlc. Accessed: February 19, 2020.

[35] California Division of Mines and Geology. 1996. *Open File Report 96-03—Update of Mineral Land Classification: Aggregate Materials in the South San Francisco Bay Production-Consumption Region*. Available: ftp://ftp.consrv.ca.gov/pub/dmg/pubs/ofr/OFR_96-03/OFR_96-03_Text.pdf. Accessed: February 18, 2020.

[36] California Department of Conservation. 2020. *AB 3098 List.* Available: https://www.conservation.ca.gov/dmr/smara-mines. Accessed: February 18, 2020.

Because the project site is in a developed urban area and does not contain any known or designated mineral resources or resource recovery sites, implementation of the proposed project would have ***no impact*** on known mineral resources or locally important mineral resource recovery sites. No mitigation is required.

4.10.7 Population and Housing

4.10.7.1 Regulatory Framework

Regional

Plan Bay Area

Plan Bay Area, created by the Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission, approved in July 2013, is a long-range (2040), integrated transportation and land use/housing strategy for the San Francisco Bay Area. Senate Bill 375, adopted in 2008, requires preparation of a Sustainable Communities Strategy (SCS), an integrated transportation, land use, and housing strategy for the Bay Area. The SCS is intended to address transportation, mobility, and accessibility needs; land development concerns; and GHG emissions reduction requirements through 2040. Included in the plan are population and housing forecasts for the Bay Area. The most recent projections, *Projections 2040*, were released by ABAG in 2019.

Regional Housing Need Plan for the San Francisco Bay Area: 2015–2023

In the Bay Area, the SCS and Regional Housing Needs Allocation (RHNA) are mutually reinforcing; they were developed together to meet the overlapping objectives of SB 375 and housing element law.[37] The City's housing element incorporates the RHNA and discusses the City's allocation of regional housing needs by income, as projected by ABAG. In addition, SB 375 requires the RHNA to be consistent with the SCS and establishes an eight-year cycle for the RHNA. The 2015–2023 RHNA has been incorporated into *Plan Bay Area*. The objectives of the RHNA include increasing the supply, diversity, and affordability of housing; promoting infill development and a more efficient land use pattern; promoting an improved intraregional relationship between jobs and housing; protecting environmental resources; and promoting socioeconomic equity. More important, the RHNA includes production targets that address the housing needs of a range of household income categories.

The RHNA determined that the Bay Area must plan for 187,990 additional housing units between 2015 and 2023.[38] South San Francisco's share of the regional housing need for this time period is 1,864 new units, with approximately 1,159 of these units allocated as affordable housing. The City's RHNA requirement represents approximately 1 percent of the total regional allocation and amounts to a citywide housing production goal of approximately 233 units per year.

---

[37] Each jurisdiction's housing element must include a strategy to meet its share of the region's housing need. Jurisdictions that do not have the capacity to meet the RHNA requirement must rezone sites with appropriate development standards to accommodate the allocation requirement.

[38] Association of Bay Area Governments. 2013. *Regional Housing Need Plan—San Francisco Bay Area, 2015–2023*. Available: https://abag.ca.gov/sites/default/files/2015-23_rhna_plan.pdf. Accessed: March 9, 2020.

Local

South San Francisco General Plan

The 1999 General Plan provides a vision for long-range physical and economic development of the City, provides strategies and specific implementing actions, and establishes a basis for judging whether specific development proposals and public projects are consistent with the City's plans and policy standards. The Economic Development Element of the General Plan provides a policy framework for ensuring South San Francisco's long-term competitiveness in the region. Based on the analysis of recognized business trends and available resources, the Economic Development Element outlines the City's economic development objectives, serves to ensure that economic decision making is integrated with other aspects of the City's development, and provides a framework for detailed implementing actions.

The General Plan Housing Element, adopted in April 2015, is the City's primary policy document regarding the development, rehabilitation, and preservation of housing for all economic segments of the population within the City's boundaries. Accordingly, the Housing Element identifies and analyzes the existing and projected housing needs of the City and states goals, policies, quantified objectives, and implementation programs for the preservation, improvement, and development of housing. The Housing Element describes housing needs and identifies the capacity for new housing in the City based on land supply and development capacity. This element focuses on the City's critical need for affordable housing. The Housing Element establishes goals for housing production, as well as policies related to mitigating the impacts of growth on the housing market. In addition, the housing element also identifies sites for housing development that are adequate with respect to accommodating South San Francisco's portion of the RHNA.

The project site is in the *East of 101 Area Plan* planning area. The General Plan states that none of the parcels, including the project site, are designated as residential. In addition, in the Planning Sub-Areas Element of the General Plan, Implementing Policy 3.5-I-3 states that no residential uses are allowed within the *East of 101 Area Plan* planning area, due to land use compatibility and the desire to protect land for employment uses.

4.10.7.2 Significance Criteria

Based on Appendix G of the CEQA Guidelines, the proposed project would have a significant population and housing impact if it would:

- 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); or
- Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere.

4.10.7.3 Approach to Analysis

Evaluation of the proposed project is based on the employment estimates provided by the project applicant and data regarding projected employment growth in the City provided by ABAG's *Projections 2040*.

4.10.7.4 Impact Evaluation

Impact PH-1: The proposed project would not 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). (*Less than Significant*)

Direct Project-Related Population Growth

Construction

Full buildout of the project is expected to take 18 months and be completed in December 2021, if the related entitlements are approved by the City. The approximate average number of construction workers onsite would be 73, with a maximum of 110 workers during building construction. It is anticipated that construction employees associated with the proposed project who are not already living in the City would commute from their residences elsewhere in the Bay Area rather than permanently relocated to South San Francisco from more distant locations; this is typical for employees in the various construction trades. Once construction is complete, construction workers typically seek employment at other job sites in the region that require their specific skills. Therefore, construction of the proposed project would not generate an unplanned population increase in the City and this impact would be ***less than significant***. No mitigation is required.

Operation

The proposed project does not propose any new housing units and would not directly induce population growth. The existing office building at 701 Gateway Boulevard would remain. The proposed project would result in approximately 731 net new employees at the project site.[39] Upon project completion, there would be approximately 1,181 total employees on-site (including the 450 employees in the 701 Gateway building who would remain). The net new employees generated by the proposed project would increase the number of employees in the City and the East of 101 Area.

As shown in Table 4.10-2, ABAG projects the City's jobs will increase by approximately 7,865, from 46,365 in 2020 to 54,230 in 2040. The 731 net new employees that would be generated by the proposed project would represent less than 10 percent of the City's total projected job increase between 2020 and 2040 and would not represent a substantial portion of the projected job growth in the City. Per ABAG job projections, this is anticipated growth for the City. Therefore, operation of the proposed project would not generate an unplanned population increase in the City and this impact would be ***less than significant***. No mitigation is required.

[39] The estimated number of employees is based on data provided by the project applicant; it assumes 60 percent of the proposed square footage (approximately 118,000 square feet) is R&D space and 40 percent of the proposed square footage (approximately 78,700 square feet) is office space. The average square footage per R&D employee is assumed to be 350, and the average square footage per office employee is assumed to be 200. The estimated number of employees associated with the proposed fitness center and café is accounted for in the estimate of the number of employees associated with the proposed R&D and office uses.

Table 4.10-2. Population, Households, and Job Growth Projections, 2010–2040

	2010	2020	2030	2040	Growth 2020–2040
Population					
Bay Area	7,150,739	7,920,230	8,689,440	9,652,950	1,732,720
San Mateo County	721,195	796,925	853,260	916,590	119,665
City of South San Francisco	64,005	68,105	76,950	80,015	11,910
Households					
Bay Area	2,608,025	2,881,965	3,142,015	3,426,700	544,735
San Mateo County	257,835	284,260	302,520	317,965	33,705
City of South San Francisco	20,940	22,155	24,950	25,305	3,150
Jobs					
Bay Area	3,451,820	4,136,190	4,405,125	4,698,375	562,185
San Mateo County	343,335	399,275	423,005	472,045	72.770
City of South San Francisco	38,720	46,365	51,000	54,230	7,865

Source: ABAG. 2019. *Projections 2040.*

Indirect Project-Related Population Growth

Infrastructure

The proposed project would be located on a developed parcel within the Gateway Campus, which includes office, R&D, childcare, and amenity uses. The project site is serviced by existing water, wastewater, stormwater, natural gas, electric, telecommunications, and waste and recycling services. New on-site facilities would be connected to new services through the installation of new, localized connections. Expansion or an increase in capacity of off-site infrastructure would occur as required by the utility providers. In addition, the proposed project would not include the extension of area roadways. Because the proposed infrastructure would be sized to meet the needs of the proposed project, it would not lead to unplanned indirect population growth or the need for additional housing beyond that expected to be generated by the proposed project and this impact would be ***less than significant***. No mitigation is required.

Employment-Related Housing Demand

The net new 731 employees generated as a result of the proposed project could increase demand for housing and contribute to total overall housing demand citywide. It is assumed that most of the employees generated by the project would be existing residents in the City, the county, or the Bay Area, but a small portion of the new employees could generate new demand for housing within the City. However, this analysis conservatively assumes that all employees generated by the proposed project would be new to the City, thereby requiring housing.

The City is primarily built out and any housing constructed within the City limits would most likely be infill housing. The total number of jobs and the total number of housing units make up an area's jobs/housing ratio. The ratio is an indicator of the extent to which the workforce may have an opportunity to live and work in the same area, assuming the occupations and skills of the employees match the occupations and skills required for the jobs and that the housing supply meets the needs of those employees. Local governments may use the jobs/housing balance as a planning tool for achieving particular policy outcomes; however, it is not a regulatory tool and does not necessarily imply a physical change in the environment or relate to any recognized threshold of significance under CEQA. A worsening jobs/housing balance may be an indicator of longer commute times, the associated environmental consequences of which, such as impacts related to transportation, air quality, and GHG emissions, are discussed throughout this EIR. Therefore, the jobs/housing balance is discussed below for informational purposes only.

As shown in Table 4.10-2, ABAG projects the City's households will increase by approximately 3,150, from 22,155 in 2020 to 25,305 in 2040. In addition, ABAG projects the City's jobs will increase by approximately 7,865, from 46,365 in 2020 to 54,230 in 2040. This means that South San Francisco is a job center that imports employees from surrounding communities or, alternatively, that exports housing, and a high level of in-commuting. Housing availability, already projected to be out of balance, would decrease with project buildout because the proposed project would result in net new employees and no increase in housing units. Therefore, the proposed project would result in an increased unfavorable jobs/housing ratio in the City. However, continued job growth in the City will promote a greater regional balance between jobs and housing. In addition, the City has several residential and mixed-use projects west of U.S. 101 that are either under construction or in the development pipeline which would add to the City's housing supply and promote a greater regional balance between jobs and housing. The City is located in Bay Area and is well served by all modes of transit, including shuttles, bus, rail, and air. Therefore, additional potential future employees would have access to a variety of transportation options for reaching the project site from throughout the Bay Area.

ABAG projects the City, on average, currently has approximately 1.54 employed residents per household.[40] Accordingly, the proposed project would create the need for up to 475 new housing units upon buildout.[41] Although it is likely that some of the new employees would be existing residents in the City or the region, the potential employment increase resulting from the proposed project could result in indirect growth that the City may not be able to accommodate with existing and projected housing in the City. The City acknowledges that much of its land area, including the East of 101 Area, is not well suited for housing development due to existing land use conflicts (e.g., proximity to SFO, the historic and existing industrial uses of the East of 101 Area, and emerging office and R&D uses in the area).[42] The City does not have an adopted jobs/housing ratio goal that would be applicable to development within the East of 101 Area and relies upon the Bay Area's regional jobs-housing balance for informational purposes only. Nonetheless, the City adopted the Affordable Housing Commercial Linkage Fees in chapter 8.69 of the Municipal Code to establish fees for non-residential development projects and to address the effect of increased job opportunities and the need for affordable housing.

[40] Association of Bay Area Governments. 2019. *Projections 2040*. Calculation based on employed residents (34,075) divided by households (22,155) in 2020.

[41] The number new housing units needed for the employees generated from the proposed project was calculated as follows: Employees generated under the proposed project divided by the number of employed residents per household. (i.e. 731/1.54= 475 housing units required).

[42] General Plan, Chapter 3, Policy 3.5-I-3, p. 3-45.

The proposed project would promote greater regional balance between jobs and housing and would be located within an area with compatible land uses, consistent with General Plan and specific plan designations. In addition, the job growth that would occur as a result of the proposed project would be consistent with the City's projected employment growth, and the project would be required to pay the commercial linkage fee under Chapter 8.69 of the Municipal Code, which would contribute to the development of affordable housing in other locations within the City. Therefore, the proposed project would not induce substantial unplanned population growth in an area, either directly (by proposing new businesses) or indirectly (through extension of roads or other infrastructure and this impact would be ***less than significant***. No mitigation is required.

Impact PH-2: The proposed project would not displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere. (*No Impact*)

The project site does not contain any existing residents or housing units. The existing 450 employees in the 701 Gateway Boulevard building would remain under the proposed project. Therefore, the proposed project would have ***no impact*** because it would not displace people or housing.

Impact C-PH-1: The proposed project would not result in a cumulatively considerable contribution to a **significant cumulative impact on population and housing. (*Less than Significant*)**

Housing and employment growth in South San Francisco is consistent with the projections contained in Plan Bay Area, which is the current Regional Transportation Plan/Sustainable Communities Strategy adopted by Metropolitan Transportation Commission and ABAG in July 2017, in compliance with California's governing GHG reduction legislation, Senate Bill 375. Plan Bay Area calls for an increasing percentage of Bay Area growth to occur as infill development in areas with good transit access where the services necessary for daily living are provided in proximity to housing and jobs. South San Francisco is expected to accommodate its fair share of future regional growth. Therefore, the Plan Bay Area projections represent the cumulative geographic context for population and housing. The cumulative projects located within approximately 0.5 mile of the project site are described in Section 4.1.5, *Approach to Cumulative Impact Analysis*, of this draft EIR and shown in Figure 4.1-1.

Direct Population Growth

The proposed project does not propose any new housing units and would not directly induce population growth. None of the cumulative projects are residential mixed-use or housing projects; thus, the cumulative projects would not increase the residential population surrounding the project site. Although the cumulative projects would generate demand for new housing units in the City, the cumulative projects would not constitute direct population growth.

For these reasons, the proposed project, in combination with other past, present, and reasonably foreseeable future projects, would not result in a direct significant cumulative population and housing impact. The cumulative impact would be ***less than significant***. No mitigation is required.

Indirect Population Growth

Infrastructure

The proposed project would be located on a developed parcel. In addition, the proposed infrastructure would be sized to meet the needs of the proposed project. Each of the cumulative projects would construct new uses on existing infill sites in an urbanized area. Development of infrastructure could remove obstacles to population growth if it would allow for development in an area that was not previously considered feasible for development because of infrastructure limitations, which could induce population growth indirectly. The proposed project and the cumulative projects would not include the extension of area roadways or expansion of infrastructure to areas lacking existing development. The East of 101 Area is confined by the San Francisco Bay on the north, east and south sides, and existing development west of U.S. 101. Therefore, the amount of development potential is limited by the amount of land available for infill development, and not generally limited by the availability of infrastructure. Some of the cumulative projects may require off-site improvements to utility infrastructure proportional to the scale of development proposed by each project. However, this infrastructure would not indirectly induce substantial population growth in the project area because the cumulative projects are located on infill sites surrounded by existing development and the proposed infrastructure improvements would be sized to meet only project needs and would not enable additional development. Furthermore, each of these projects would be required to provide impact fees associated with City infrastructure improvements. For these reasons, the proposed project, in combination with other past, present, and reasonably foreseeable future projects, would not result in a significant indirect population growth as a result of expansion of infrastructure. The cumulative impact would be ***less than significant***. No mitigation is required.

Employment-Related Housing Demand

As discussed under Impact PH-1, the City is a job center that imports employees from surrounding communities or, alternatively, that exports housing. Housing availability, already projected to be out of balance, would decrease with implementation of the proposed project in combination with past, present, and reasonably foreseeable future projects, and would result in an increased unfavorable jobs/housing ratio in the City.

The proposed project would result in approximately 731 net new employees at the project site.[43] The cumulative projects primarily include office, R&D, hotel, and other commercial uses. The cumulative projects would generate approximately 19,167 employees.[44] Therefore, at project

[43] The estimated number of employees is based on data provided by the project applicant; it assumes 60 percent of the proposed square footage (approximately 118,000 square feet) is R&D space and 40 percent of the proposed square footage (approximately 78,700 square feet) is office space. The average square footage per R&D employee is assumed to be 350, and the average square footage per office employee is assumed to be 200. The estimated number of employees associated with the proposed fitness center and café is accounted for in the estimate of the number of employees associated with the proposed R&D and office uses.

[44] The employee generated by each of the cumulative projects was calculated using the following employee generation rates from the General Plan: 450 square feet of office/R&D space per employee, 400 square feet of commercial space per employee, and 955 square feet of industrial space per employee. The employee generation rates used for the proposed project is based on data provided by the project applicant and, thus, differs from the employee generation rates used for the cumulative projects, which are based on the General Plan.

buildout, the proposed project in combination with other projects would generate approximately 19,898 new employees in the City. As previously discussed, the City is projected to have 54,230 jobs in 2040. The proposed project in combination with the other projects would represent approximately 37 percent of the total jobs projected in the City in 2040, and approximately 244 percent of the incremental job growth from 2020-2040. The total job growth generated by the project and cumulative projects would be within total job growth projections for the City and consistent with the long-term goal of developing and intensifying office and R&D uses within the Gateway Specific Plan and East of 101 Area; however, the job growth generated by the project and cumulative projects would exceed the City's incremental job growth projections from 2020-2040.

ABAG projects the City, on average, currently has approximately 1.54 employed residents per household.[45] Accordingly, the proposed project would create the need for up to 475 new housing units upon buildout and the cumulative projects would create the need for up to 12,446 new housing units upon buildout.[46] Although it is likely that some of the new employees would be existing residents in the City or the region, the potential employment increase resulting from the proposed project could result in indirect growth that the City may not be able to accommodate with existing and projected housing in the City. The City acknowledges that much of its land area, including the East of 101 Area, is not well suited for housing development due to existing land use conflicts (e.g., proximity to SFO, the historic and existing industrial uses of the East of 101 Area, and emerging office and R&D uses in the area).[47] The City does not have an adopted jobs/housing ratio goal that would be applicable to development within the East of 101 Area and references the Bay Area's regional jobs-housing ratio data for informational purposes only, for the purposes of developing or analyzing policies. Nonetheless, the City adopted the Affordable Housing Commercial Linkage Fees in Chapter 8.69 of the Municipal Code to establish fees for non-residential development projects and to address the effect of increased job opportunities and the need for affordable housing. In addition, the City has several residential and mixed-use projects west of U.S. 101 that are either under construction or in the development pipeline which would add to the City's housing supply and help to offset the housing demand generated by the proposed project and cumulative projects.[48] Furthermore, as part of the City's General Plan Update, some areas throughout the City that are not considered for residential land uses under the current General Plan may be re-designated and re-zoned to allow for residential development in order to help accommodate for future housing demands.

Based on the analysis above, there would be a ***significant*** cumulative impact on indirect population growth as a result of increasing employment-related housing demand, due to the lack of housing available within the City. However, the project's contribution to the cumulative impact would not be cumulatively considerable and would be ***less than significant*** because growth under the project would be consistent with the long-term goal of developing and intensifying office and R&D uses within the Gateway Specific Plan and East of 101 Area, and within the growth projections for the City. No mitigation is required.

---

45 Association of Bay Area Governments. 2019. *Projections 2040*. Calculation based on employed residents (34,075) divided by households (22,155) in 2020.

46 The number new housing units needed for the employees generated from the cumulative projects was calculated as follows: Employees generated by the cumulative projects divided by the number of employed residents per household. (i.e. 19,167/1.54= 12,446 housing units required).

47 General Plan, Chapter 3, Policy 3.5-I-3, p. 3-45.

48 City of South San Francisco. 2020. *South San Francisco Development and Construction Map*. Available: http://construction.ssf.net/. Accessed: April 27, 2020.

4.10.8 Public Services

4.10.8.1 Regulatory Framework

State

California Fire Code

The California Fire Code, 2019 edition, as published by the International Code Council and adopted by the State Fire Marshal, is adopted by reference by the City of South San Francisco. Section 13000 *et seq.* of the California Health Safety Code includes regulations concerning the building standards set forth in the California Building Standards Code and state fire regulations. These include standards concerning fire protection and notification systems; fire protection devices, such as extinguishers and smoke alarms; fire suppression training; and high-rise construction.

Local

South San Francisco General Plan

The 1999 General Plan provides a vision for long-range physical and economic development of the City, provides strategies and specific implementing actions, and establishes a basis for judging whether specific development proposals and public projects are consistent with the City's plans and policy standards. The General Plan contains a Health and Safety Element, which acknowledges and mitigates the risks posed by hazards (e.g., fire) and ensures adequate police service. The General Plan includes the following policies applicable to public services:

- Policy 8.4-G-1: Minimize the risk to life and property from fire hazards in South San Francisco.
- Policy 8.4-G-2: Provide fire protection that is responsive to citizens' needs.
- Policy 8.4-I-4[49]: Require site design features, fire-retardant building materials, and adequate access as conditions for approval of development or improvements to reduce the risk of fire within the City.
- Policy 8.5-G-1: Provide police services that are responsive to citizens' needs to ensure a safe and secure environment for people and property in the community.
- Policy 8.5-I-1: Ensure adequate police staff to provide a rapid and timely response to all emergencies and maintain the capability to have minimum average response times.

  Actions that could be taken to ensure rapid and timely response to all emergencies include:

  - Maintain a law enforcement standard of 1.5 police officers per 1,000 residents;
  - Analyze and monitor factors affecting response time (population growth, police staffing, community policing programs) and average response times as guidelines based on past experience;
  - Maintain, train, and equip special response teams for extraordinary or extremely hazardous emergency incidents; and
  - Develop and/or use the City's Geographic Information System (GIS) for analysis of issues including crime location trends and response routes (see policy 2-I-14).

[49] Policy 8.4-I-4 is misnumbered in the General Plan as the second Policy "8.4-I-3".

4.10.8.2 Significance Criteria

Based on Appendix G of the CEQA Guidelines, the proposed project would have a significant public services impact if it would:

- Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or the 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:
  - Fire protection,
  - Police protection,
  - Schools,
  - Parks, or
  - Other public facilities;

4.10.8.3 Approach to Analysis

Evaluation of the proposed project is based on considering how employee population growth resulting from implementation of the proposed project would affect public services. According to the CEQA significance criteria, the proposed project would have an adverse environmental impact if it were to result in a substantial adverse physical impact associated with the provision of new or physically altered government facilities, the construction of which could cause significant environmental impacts, to maintain acceptable service ratios, response times, or other performance objectives for any public services (i.e., fire and police protection, schools, parks, other public facilities). Physical impacts associated with parks are discussed in Section 4.10.9, *Recreation*, of this draft EIR.

4.10.8.4 Impact Evaluation

Impact PS-1: The proposed project would not require the provision of new or physically altered fire and emergency medical services in order to maintain acceptable service ratios, response times, or other performance objectives. (*Less than Significant*)

The South San Francisco Fire Department (SSFFD) provides fire protection and emergency services for the project area. The department has 87 full-time-equivalent employees and 4.93 hourly and contract employees for operations that include fire prevention, emergency medical services, and administrative work.[50] A minimum of 24 emergency responders are on-duty during each of the department's three shifts. The Health and Safety Element of the General Plan does not identify a personnel-to-service population ratio.

There are five fire stations in the City. The nearest fire station to the project is Fire Station No. 62 at 249 Harbor Way, approximately 0.8 mile south of the project site. Fire Station No. 62 has three apparatus bays. Fire Station No. 62 would be supported by Fire Station No. 61 and Fire Station

[50] City of South San Francisco. 2019. *Adopted Biennial Operating Budget and Capital Improvement Program, Fiscal Years 2019–2021*. Available: https://www.ssf.net/home/showdocument?id=16797. Accessed: February 24, 2020.

No. 65. The project site is not within a Fire Hazard Management Unit.[51] Existing access to the project site, via Gateway Boulevard, East Grand Avenue, and Oyster Point Boulevard, would not change as a result of the proposed project.

The SSFFD's goal is to arrive at emergency incidents within seven minutes of a call, including four minutes for travel time.[52,53] To determine the adequacy of fire and emergency medical service in the East of 101 Area, the City mapped areas that can be traveled to within 4 minutes from Station No. 62.[54] Areas at the northeastern end of the East of 101 Area, including the project site, are within the existing Fire Station No. 62 4-minute travel time capability. Therefore, no new firefighting facilities would be necessary to serve the proposed project.

The proposed project would increase the demand for fire protection services as a result of the increased number of employees (i.e., 731 net new employees). Table 4.10-3 identifies the estimated annual service calls, calls per day, and firefighter demand generated by the proposed project. The proposed project would generate approximately 7 calls per year and fewer than 1 call per month. Therefore, the project would not require additional emergency-medical or fire-response personnel.

Table 4.10-3. Estimated Project Demand for Fire Protection and Emergency Medical Response

	Proposed Office/R&D Space (square feet)	Annual Service Calls	Total Calls per Day	Firefighter Demand
Proposed Project	208,800	7.06	.019	0

Note: The average annual call volume was calculated using an annual service call generation rate of 0.0338 calls per 1,000 square feet of Office/R&D as follows: 0.0338 calls x (208,800 square feet/ 1,000 square feet) = 7.06 annual service calls.

Source: Michael Baker International. 2017. 2017 Oyster Point Specific Plan Update Appendix I- Municipal Services Assessment, Table A-1: Firefighter/Emergency Response Call Volume Demand Estimates. Available: https://weblink.ssf.net/WebLink/0/doc/367046/Page1.aspx. Accessed: February 25, 2020.

The SSFFD also commented on the proposed project through the City's standard review process. Staffing and service issues were not identified with respect to site development.

Based on the analysis above, although the project would result in more employees at the project site, it is expected that the proposed land uses would not lead to a substantial increase in service calls to SSFFD. In addition, it is anticipated that the project would not lead to an increase in SSFFD service call response times. Furthermore, the proposed project would be required to comply with the City's standard conditions, which will be attached to the entitlements for the proposed project, including Condition No. 26, which requires compliance with City the City's Fire Code Ordinance. In addition, the proposed project would be required to comply with any project-specific conditions of approval

[51] City of South San Francisco. 1999. *City of South San Francisco General Plan.* Health and Safety Element. Available: https://www.ssf.net/home/showdocument?id=472. Accessed: February 24, 2020.

[52] Michael Baker International. 2017. *2017 Oyster Point Specific Plan Update Appendix I- Municipal Services Assessment.* Available: http://weblink.ssf.net/weblink/0/fol/51192/Row1.aspx?dbid=0&startid=51192&row=1. Accessed: February 25, 2020.

[53] Response time is defined as the time that elapses between the moment a call is received by dispatch and the moment when the first unit assigned to the call arrives at the scene.

[54] Michael Baker International. 2017. 2017 Oyster Point Specific Plan Update Appendix I- Municipal Services Assessment, Map7b- 4 Minute Travel Time from Station 62. Available: https://weblink.ssf.net/WebLink/0/doc/367046/Page1.aspx. Accessed: February 24, 2020.

which includes payment of the Public Safety Impact Fee for the East of 101 Area Therefore, the proposed project would not result in substantial adverse environmental impacts associated with the construction or alteration of fire protection facilities to maintain acceptable service ratios, response times, or other performance objectives and this impact would be ***less than significant***. No mitigation is required.

Impact PS-2: The proposed project would not require the provision of new or physically altered police protection services in order to maintain acceptable service ratios, response times, or other performance objectives. (*Less than Significant*)

The South San Francisco Police Department (SSFPD) provides police protection services for the project area. The department consists of a records division, communications division, canine unit, evidence division, neighborhood response team, and traffic unit; it also conducts day and night patrols. The SSFPD has a total of 117 full-time-equivalent employees and 4.87 hourly and contract employees.[55] The department's 83 sworn officers and 35 civilian employees equate to a ratio of 1.75 officers per 1,000 residents.[56,57]

There is only one SSFPD police station in the City; the station is located at 33 Arroyo Drive, approximately 2.2 miles west of the project site. A police sub-station is also located in the downtown, approximately 1.1 miles west of the project site. A new police headquarters that will replace the existing police station is part of the City's Community Civic Campus project, which is currently under construction. The new police headquarters will be approximately 44,000 square feet compared to the approximately 32,000-square-foot existing police station. The new police headquarters will result in an approximately 12,000 square feet of additional facility space.[58]

Policy 8.5-I-1 of the General Plan Health and Safety Element seeks to maintain a target ratio of 1.5 officers per 1,000 residents to ensure rapid and timely response to all emergencies. The proposed project does not propose any new housing units and would not impact the ratio of officers per resident. In 2016, the most recent year for which data is available, the response time to emergency calls averaged three minutes and 59 seconds; the response time to non-emergency calls averaged six minutes and three seconds.[59] These response times are considered acceptable under SSFPD goals, although there are no adopted standards.

The proposed project would increase the demand for police protection services as a result of the increased number of employees (i.e., 731 net new employees). Table 4.10-4 identifies the estimated annual service calls, calls per day, and police demand generated by the proposed project. The proposed project would generate fewer than 5 calls per year and fewer than 1 call per month. Therefore, the project would not require additional police personnel.

---

55 City of South San Francisco. 2019. *Adopted Biennial Operating Budget and Capital Improvement Program, Fiscal Years 2019–2021*. Available: https://www.ssf.net/home/showdocument?id=16797. Accessed: February 24, 2020.

56 Based on the City's 2018 total population of 67,587. City of South San Francisco. n.d. *South San Francisco Demographic Information- South San Francisco Population*. Available: https://www.ssf.net/our-city/about-south-san-francisco/demographic-information. Accessed: February 25, 2020.

57 City of South San Francisco. n.d. *Police Department Divisions*. Available: https://www.ssf.net/departments/police/divisions. Accessed: February 25, 2020.

58 City of South San Francisco. 2020. *Community Civic Campus Program—Police Station*. Available: http://www.measurewssfcivic.com/index.php/29-project-stats/107-police-station. Accessed: April 27, 2020.

59 Michael Baker International. 2017. *2017 Oyster Point Specific Plan Update Appendix I Municipal Services Assessment*. Available: http://weblink.ssf.net/weblink/0/fol/51192/Row1.aspx?dbid=0&startid=51192&row=1. Accessed: February 25, 2020.

Table 4.10-4. Estimated Police Protection Incidents Generated by the Proposed Project

	Proposed Office/R&D Space (square feet)	Annual Service Calls	Total Calls per Day	Police Demand
Proposed Project	208,800	4.6	.012	0

Note: The average annual call volume was calculated using an annual service call generation rate of 0.0221 calls per 1,000 square feet of Office/R&D as follows: 0.0221 calls x (208,800 square feet/ 1,000 square feet) = 4.61 annual service calls.

Source: Michael Baker International. 2017. 2017 Oyster Point Specific Plan Update Appendix I- Municipal Services Assessment, Table A-2: Police Department Response Call Volume Demand Estimates. Available: https://weblink.ssf.net/WebLink/0/doc/367046/Page1.aspx. Accessed: February 25, 2020.

The SSFPD also commented on the proposed project through the City's standard review process. Staffing and service issues were not identified with respect to site development. The proposed project would be required to comply with the City Municipal Code, chapter 15.48.070, which includes specifications for security design measures, as a standard condition of project approval. Furthermore, the proposed project would be required to pay the Public Safety Impact Fee for the East of 101 Area as a condition of approval. Therefore, the proposed project's increased demand for services would not be substantial, given the overall demand for police protection throughout the City.

Based on the analysis above, although the project would result in more employees at the project site, it is expected that the proposed land uses would not lead to a substantial increase in service calls to SSFPD. In addition, it is anticipated that the project would not lead to an increase in SSFPD service call response times. The upgrade to police facilities that is currently underway would further reduce response times and service ratios. Furthermore, the proposed project would be required to comply with the City's standard conditions, which will be attached to the entitlements for the proposed project, including Condition No. 25, which requires compliance with City's Minimum Building Security Standards Ordinance. In addition, the proposed project would be required to comply with any project-specific conditions of approval. Therefore, the proposed project would not result in substantial adverse environmental impacts associated with the construction or alteration of police protection facilities to maintain acceptable service ratios, response times, or other performance objectives and this impact would be ***less than significant***. No mitigation is required.

Impact PS-3: The proposed project would not require the provision of new or physically altered schools or other public facilities in order to maintain acceptable service ratios or other performance objectives. (*Less than Significant*)

Schools and Libraries

The South San Francisco Unified School District (SSFUSD) and South San Francisco Public Library serve the project area. As discussed in Section 4.10.7, *Population and Housing*, of this draft EIR, it is anticipated that some of the proposed project's employees may relocate to the City, thereby generating a small indirect increase in student enrollment or library use. However, because the proposed project would not involve the construction of any housing units, it is not anticipated that the proposed project would generate a substantial increase in demand for SSFUSD or South San Francisco Public Library services. As part of phase II of the City's Community Civic Campus project, a new library will be constructed, which is scheduled to begin construction in late 2020 and would likely increase the South San Francisco Public Library's capacity. The new library would replace the existing main library. In addition, the proposed project would be subject to a SSFUSD fee based on the square footage of the proposed development. Therefore, the proposed project would not result in substantial adverse environmental impacts associated with the construction or alteration of school or library facilities to maintain acceptable service ratios or other performance objectives and this impact would be ***less than significant***. No mitigation is required.

Childcare

The proposed project would increase the demand for preschool childcare services as a result of the increased number of employees (i.e., 731 net new employees). An adequate number of preschool and other childcare facilities currently exist in the City and would likely be able to accommodate the increase in demand for preschool childcare services that would be generated by the proposed project.[60] In addition, the proposed project would be required to pay the City's Childcare Impact Fee Program. The purpose of this program is to provide new and expanded childcare facilities with funding from new developments. Therefore, the proposed project would not result in substantial adverse environmental impacts associated with the construction or alteration of childcare facilities to maintain acceptable service ratios or other performance objectives and this impact would be ***less than significant***. No mitigation is required.

Impact C-PS-1: The proposed project, in combination with past, present, and reasonably foreseeable future projects, would not result in a significant cumulative impact on public services. (*Less than Significant*)

The cumulative geographic context for public services varies according to the type of public service. The cumulative geographic contexts for fire, police, and school service are the service areas of the SSFFD, SSFPD, and SSFUSD, respectively. The cumulative geographic context for library and childcare service is the generally the City. The cumulative projects located within approximately 0.5 mile of the project site are described in Section 4.1.5, *Approach to Cumulative Impact Analysis*, of this draft EIR and shown in Figure 4.1-1.

The City has several residential and mixed-use projects west of U.S. 101 that are either under construction or in the development pipeline which would increase the number of housing units in the City. Thus, the cumulative projects would generate a direct increase in the demand for fire, police, school, library, and childcare services. The proposed project would not involve the construction of any housing units. Some of the employees generated by the proposed project or the cumulative projects may relocate to the City, thereby generating a small indirect student population increase or an increase in library use. However, it is not anticipated that the SSFUSD or the South San Francisco Public Library would experience a substantial growth in demand. Furthermore, the cumulative projects, similar to the proposed project, would be subject to a SSFUSD development impact fee based on the square footage of each project, and would be subject to the South San Francisco Childcare Impact Fee. The cumulative projects, in combination with the proposed project, would increase the number of residents and employees in the area, leading to an increase in demand for fire protection, police protection, and childcare services. SSFFD and SSFPD are essential service

[60] Sarah Kinahan Consulting. 2017. *San Mateo County Childcare and Preschool Needs Assessment*. November 2017. Available: https://www.smcoe.org/assets/files/About_FIL/Child%20Care%20Partnership%20Council_FIL/Needs%20Assessment_FIL/CCPC_Full_Report_Needs_Assessment_11-17.pdf. Accessed: February 24, 2020.

providers that continually assess demand based on anticipated growth and service needs. By analyzing applicable metrics, SSFFD and SSFPD are able to adjust staffing, capacity, response times, and other measures of performance. In addition, most (if not all) the cumulative projects, similar to the proposed project, would be subject to the Public Safety Impact Fee of the East of 101 Area and the City's Childcare Impact Fee Program. Therefore, the cumulative projects would not result in any service gaps related to schools, libraries, fire, police, or childcare services. For these reasons, the proposed project, in combination with other past, present, and reasonably foreseeable future projects, would not result in a significant cumulative public services impact. The cumulative impact would be ***less than significant***. No mitigation is required.

Parks

Refer to Section 4.10.9, *Recreation*, for a discussion of impacts on parks.

4.10.9 Recreation

4.10.9.1 Regulatory Framework

Local

South San Francisco General Plan

The 1999 General Plan provides a vision for long-range physical and economic development of the City, provides strategies and specific implementing actions, and establishes a basis for judging whether specific development proposals and public projects are consistent with the City's plans and policy standards. The General Plan contains a Parks, Public Facilities, and Services Element, which outlines policies relating to parks and recreation, educational facilities, and public facilities. The General Plan includes the following policy applicable to recreation:

- Policy 5.1-G-3: Provide a comprehensive and integrated network of parks and open space; improve access to existing facilities where feasible.

South San Francisco Parks and Recreation Master Plan

The City of South San Francisco Parks and Recreation Department manages parks and recreation centers within the City's boundaries. The master plan includes the following goals that are relevant to recreation:

- Goal 4: Incorporate innovative amenities to serve multiple user groups as new parks and facilities are developed or existing parks are renovated.
- Goal 11: Incorporate sustainable features into parks and facilities to increase water conservation, energy efficiency, and habitat values; encourage non-motorized transportation; and educate about the environment.

South San Francisco Municipal Code, Title 8, Chapter 8.67

According to the South San Francisco Municipal Code Title 8, *Health and Welfare*, Chapter 8.67, *Parks and Recreation Impact Fee*, the City determined that in order to provide sufficient funding to achieve the City's goal of maintaining park service levels and providing adequate parks and recreational services and facilities to residents of the City, certain development projects, as outlined in Section 8.67.050, would be required to pay a parkland acquisition fee and a park construction fee in order to mitigate the impacts of the development projects on parks and recreational services and facilities within the City. The proposed project falls is considered a development project as defined in Section 8.67.050 and would be required to pay the impact fee.

4.10.9.2 Significance Criteria

Based on Appendix G of the CEQA Guidelines, the proposed project would have a significant recreation impact if it would:

- Result in substantial adverse physical impacts associated with the provision of new or physically altered park facilities or the need for new or physically altered park facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives.
- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated, or
- Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

4.10.9.3 Approach to Analysis

Evaluation of the proposed project is based on considering how employee population growth resulting from implementation of the proposed project would affect recreational facilities. The analysis also considers whether environmental impacts would result from development of the proposed open space improvements that would be incorporated as part of the proposed project. According to the CEQA significance criteria, the proposed project would have an adverse environmental impact if it were to result in a substantial adverse physical impact associated with the provision of new or physically altered government facilities, the construction of which could cause significant environmental impacts, to maintain acceptable service ratios, response times, or other performance objectives for any public services (e.g., parks).

4.10.9.4 Impact Evaluation

Impact REC-1: The proposed project would not require the provision of new or physically altered park facilities in order to maintain acceptable service ratios or other performance objectives. (*Less than Significant*)

The City of South San Francisco Parks and Recreation Department manages over 270 acres of parks and open space parks and outdoor recreational facilities within the City, including 145 acres of 21 parks and playgrounds; over 80 acres of open space at Sign Hill Park, Oyster Point Marina, and a community garden; and 14 acres of athletic fields.[61]

As discussed in Section 4.10.7, *Population and Housing*, of this draft EIR, it is anticipated that some of the proposed project's employees may relocate to the City, thereby generating a small indirect increase in park use. However, because the proposed project would not involve the construction of any housing units, it is not anticipated that the proposed project would generate a substantial increase in demand

---

61 City of South San Francisco Parks Division. 2020. *Parks*. Available: https://www.ssf.net/departments/parks-recreation/parks-division. Accessed: April 28, 2020.

for City of South San Francisco Parks and Recreation Department park facilities. In addition, a 1.3-acre park s included in phase II of the City's Community Civic Campus project, which is scheduled to begin construction in late 2020 and would increase the amount of park space in the City. Furthermore, as defined in South San Francisco municipal code section 8.67, and described above in section 4.10.9.1, *Regulatory Framework*, the proposed project would be required to pay the parks and recreation impact fees to help the City achieve its goal of maintaining park service levels and providing adequate facilities, in order to help mitigate any impacts that may result from development projects. Therefore, the proposed project would not result in substantial adverse environmental impacts associated with the construction or alteration of park facilities to maintain acceptable service ratios or other performance objectives and this impact would be ***less than significant***. No mitigation is required.

Impact REC-2: The proposed project would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated. (*Less than Significant*)

Table 4.10-5 identifies nine open space and recreational facilities within one mile of the project site. In addition, a 1.3-acre park that is part of phase II of the City's Community Civic Campus project, which is scheduled to begin construction in late 2020 and would increase the amount of park space in the City. The proposed project would increase the demand for recreational facilities as a result of the increased number of employees (i.e., 731 net new employees). However, this use would not substantially deteriorate existing parks or recreational facilities based on the relatively small number of new employees expected to occupy the proposed new building and because employees would most likely visit parks only briefly during lunch or while on breaks. The Bay Trail is the nearest recreational facility, located 0.2 mile north of the project site. The Bay Trail is a paved hardscaped resource that is designed for repetitive use for commuting and recreational use for users across the entire Bay Area. To accommodate future demand from employees, the proposed project would include an outdoor entry plaza northwest of the proposed building and an outdoor amenity space southwest of the proposed building. Both the entry plaza and the amenity space would include landscaping, outdoor gathering areas, and seating areas. In addition, the project would include new landscaping along the perimeter of the site. It is anticipated that the proposed amenities would partially offset recreation demand from employees on-site.

Because of accessibility, future employees would most likely choose to use onsite facilities provided as part of the proposed project and the nearby parks listed in Table 4.10-5, instead of more distant park and recreational facilities. Existing employees on the project site and in the surrounding area who use existing parks and recreational facilities may choose to visit the new facilities that would be provided with the proposed project. This could reduce the rate of deterioration at existing parks and recreational facilities both within and near the project area. Furthermore, as defined in South San Francisco municipal code section 8.67, and described above in section 4.10.9.1, *Regulatory Framework*, the proposed project would be required to pay the parks and recreation impact fee to help the City achieve its goal of maintaining park service levels and providing adequate facilities, in order to help mitigate any impacts that may result from development projects.

Although the number of park users is expected to increase as a result of the proposed project, such an increase, in and of itself, would not cause substantial physical deterioration of existing facilities or a need for new facilities to be constructed. Other factors that contribute to physical degradation of recreational resources include the availability of facilities, park design, the age of the infrastructure, how the park is used, and the level of maintenance. Given the variety of nearby open space and recreational facilities, the increased usage of any one park by new employees at the project site would not be substantial. In addition, the provision of adequate onsite open space under

Table 4.10-5. Open Space and Recreational Facilities within 1 Mile of the Project Site

Name	Size (acres)	Amenities	Distance from Project Site (mile)
Oyster Point Marina	4.7 acres	Open lawns, walking trails, benches, picnic areas, marina, pier, beach, ferry building, and live-aboard boat docking	0.6 mile east
Wind Harp Park	0.5 acre	Open lawn, public art feature, walking trail, and benches	0.8 mile southeast
Bay Trail	6 miles within the City	Bicycle and pedestrian trail, picnic tables, barbeques, and benches	0.2 mile north
Jack Drago Park	0.8 acres	Open lawn, landscaped areas, and a bench	0.5 mile southwest
Irish Town Greens	1.5 acres	Flat open lawn, usable for active play (i.e., frisbee or pick-up soccer)	0.4 mile west
Gardiner Playlot	0.1 acre	Children's play area, and half court	0.3 mile northwest
Paradise Valley Pocket Park and Paradise Valley Recreation Center Park	1.1 acres (Pocket Park) 0.8 acre (Recreation Center Park)	Open lawn, walking trail, children's play area, recreation building, restrooms, picnic tables, and basketball court	0.7 mile northwest
Cypress and Pine Playlot	0.3 acre	Open lawn, children's play area, picnic tables, two half courts	0.5 mile west
City Hall Playlot and Grounds	1.8 acre	Children's play area, picnic tables, and a fountain	0.9 mile southwest

Source: City of South San Francisco. 2015. *Parks and Recreation Master Plan*. Available: https://www.ssf.net/home/showdocument?id=498. Accessed: February 21, 2020.

the proposed project would not increase the use of nearby recreational facilities such that substantial physical deterioration of existing facilities would occur or be accelerated. Therefore, impacts related to the use of existing parks and recreational facilities would be ***less than significant***. No mitigation is required.

Impact REC-3: The proposed project would not include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment. (*Less than Significant*)

Any potential adverse effects from the incorporation of open space as part of the proposed project would be associated with construction of the open space, such as noise or air quality impacts (e.g., emissions of dust and other pollutants). These potential impacts are addressed in Sections 4.2 through 4.10 of this draft EIR as part of the analysis of construction impacts for the proposed project as a whole, with mitigation measures provided as necessary. Overall, no significant physical effect on the environment associated with construction of open spaces is anticipated, and no long-term effects from physical operation of these facilities are anticipated. Construction of the open spaces proposed by the project would not result in additional significant impacts that are not disclosed elsewhere in this environmental document; therefore, physical environmental impacts resulting from the construction of open space under the proposed project would be ***less than significant***. No mitigation is required.

Impact C-REC-1: The proposed project, in combination with past, present, and reasonably foreseeable future projects, would not result in a significant cumulative impact on recreation. (*No Impact*)

The cumulative geographic context for recreation is the City in addition to all existing and potential new open spaces that will be available to and accessible by employees in the project area. The cumulative projects located within approximately 0.5 mile of the project site are described in Section 4.1.5, *Approach to Cumulative Impact Analysis*, of this draft EIR and shown in Figure 4.1-1.

The City has several residential and mixed-use projects west of U.S. 101 that are either under construction or in the development pipeline which would increase the number of housing units in the City. Thus, the cumulative projects would generate a direct increase in the demand for fire, park facilities. The cumulative projects, in combination with the proposed project, would increase the number of residents and employees in the City, leading to an increase in demand for recreational facilities. As discussed under Impacts REC-1, REC-2, and REC-3, the proposed project would not physically degrade any existing recreational resources, would not result in significant effects related to the construction of new open spaces, would not increase demand for and use of either neighborhood parks or recreational facilities such that it would result in substantial physical deterioration. In addition, the cumulative projects, similar to the proposed project, would be required to pay the parks and recreation impact fee. Furthermore, additional recreational facilities are being developed throughout the City or are in the planning stages (e.g., the 1.3-acre park that is part of the City's Community Civic Campus project, the Bicycle Master Plan [No. 23]) to address existing and future recreational needs. Similar to the project, new employees in the East of 101 Area would also use portions of the Bay Trail that are near their sites. Because the Bay Trail is a paved hardscaped resource that is designed for repetitive use for commuting and recreational use for users across the entire Bay Area, the additional use by new development would not result in a significant cumulative impact on this recreational facility. As with the proposed project, other development projects proposed or under consideration nearby would be required to include on-site recreational open space and amenities for the residents and employees who would occupy their developments. For these reasons, and given that the proposed project would increase open space within the project site and surrounding area, the proposed project, in combination with other past, present, and reasonably foreseeable future projects, would not result in a significant cumulative recreational facilities impact. The cumulative impact would be ***less than significant***. No mitigation is required.

4.10.10 Utilities

4.10.10.1 Regulatory Framework

State

Senate Bill 610 and Senate Bill 221

Senate Bill (SB) 610 requires cities and counties to confirm through a water supply assessment (WSA) that sufficient water supply sources are available before certain large development are approved (see California Water Code Sections 10910 through 10915). The WSA for a project must be included in that project's CEQA documentation. A WSA must be prepared if a project includes, among other things: (1) the equivalent demand of 500 residential units; or (2) a shopping center or business establishment that employs more than 1,000 persons or has a floor space of more than

500,000 square feet; or (3) a commercial office building that employees more than 1,000 persons or has a floor space of more than 250,000 square feet. A WSA is not required for the proposed project because the proposed project would result in approximately 731 net new employees at the project site and would include approximately 208,800 square foot office/R&D space, which would be less than the 1,000 persons or 250,000 square feet of floor space associated with a commercial office building use under SB 610. Additionally, the proposed project would not result in the equivalent water demand of 500 residential units.[62] Therefore, the proposed project would not meet any of the requirements for the preparation of a WSA.

SB 221 requires a water supply verification, which is a letter of assurance for water from a water purveyor. A water supply verification is prepared to support approval of a tentative map. A water supply verification s not required for the proposed project because the proposed project would not require approval of a tentative tract map.

Assembly Bill 939 and Senate Bill 1016

The California Integrated Waste Management Act of 1989, or AB 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 (from 1990 levels), beginning January 1, 2000, and divert at least 75 percent by 2010. In 2006, SB 1016 updated the requirements. The new per capita disposal and goal measurement system moves the emphasis from an estimated diversion measurement number to an actual disposal measurement number, along with an evaluation of program implementation efforts. These two factors will help determine each jurisdiction's progress toward achieving AB 939 diversion goals. The 50 percent diversion requirement is now measured in terms of per capita disposal, expressed as pounds per day. Under the SB 1016 measurement system, a City is required to annually dispose of an amount equal to or less than its "50 percent equivalent per capita disposal target," as calculated by CalRecycle.

Title 24

In accordance with CCR Title 24, part 6 (last amended in 2019, effective January 1, 2020), buildings constructed after June 30, 1977, must comply with the standards identified in CCR title 24. The code covers five categories: planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and indoor environmental quality. Title 24 requires the inclusion of state-of-the-art energy conservation features in building designs and construction, such as specific energy-conserving design features and non-depletable energy resources. In addition, it must be demonstrated that a building would comply with a designated energy budget. Part 11 of the Title 24 Building Standards Code is referred to as the California Green Building Standards Code (CALGreen Code). Unless otherwise noted in a regulation, all newly constructed buildings in California are subject to the requirements of the CALGreen Code.

[62] As shown in Table 4.10-6, the proposed project would result in a net increase in water consumption of 15,132 gallons per day. A 500-residential unit project would consume approximately 150 to 250 acre-feet per year (or 133,911 to 223,186 gallons per day) assuming 0.3 to 0.5 acre-feet of water per year per dwelling unit "depending upon several factors" according to the Department of Water Resources *Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001*. Therefore, the proposed project would not result in the equivalent water demand of 500 residential units.

Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act of 2014 (SGMA) is a comprehensive three-bill package that Governor Jerry Brown signed into California state law in September 2014. The Sustainable Groundwater Management Act provides a framework for sustainable management of groundwater supplies by local authorities, with a limited role for state intervention only if necessary to protect the resource. The plan is intended to ensure a reliable groundwater water supply for California for years to come. SGMA requires the formation of local Groundwater Sustainability Agencies (GSA), which are required to adopt groundwater sustainability plans (GSPs) to manage the sustainability of groundwater basins. The adoption of a GSP is required for all high- and medium-priority basins as identified by DWR or submit an alternative to a GSP. SGMA also requires governments and water agencies of high and medium priority basins to halt overdraft and bring groundwater basins into balanced levels of pumping and recharge.

Urban Water Management Planning Act

The Urban Water Management Planning Act requires every public and private urban water supplier that directly or indirectly provides water for municipal purposes to prepare and adopt an urban water management plan (UWMP). This plan is required to be updated every five years, in years ending with "0" or "5." The UWMP must include a description of the reliability of the water supply and vulnerability to seasonal or climatic shortage (to the extent practicable) and provide data for average, single-dry, and multiple-dry water years as well as an urban water shortage contingency analysis.

The California Water Service Company prepared the last UWMP in 2015 for the South San Francisco District, providing information about the district's historical and projected water demands, water supplies, supply reliability and vulnerability, water shortage contingency planning, and demand management programs. The plan is used as a long-range planning document by the California Water Service Company for water supply and system planning.

NPDES Permits

Refer to Section 4.10.4, *Hydrology and Water Quality*, of this draft EIR, for a discussion of the NPDES permit applicable to the proposed project.

Local

South San Francisco General Plan

The 1999 General Plan provides a vision for long-range physical and economic development of the City, provides strategies and specific implementing actions, and establishes a basis for judging whether specific development proposals and public projects are consistent with the City's plans and policy standards. The General Plan contains a Parks, Public Facilities, and Services Element, which outlines policies relating to parks and recreation, educational facilities, and public facilities. The General Plan contains a Health and Safety Element, which acknowledges the importance of reducing solid waste. The General Plan includes the following policy applicable to utilities and service systems:

- Policy 5.3-G-1: Promote the orderly and efficient operation and expansion of the water supply system to meet projected needs.

- Policy 5.3-G-2: Encourage water conservation measures for both existing and proposed development.
- Policy 5.3-G-3: Promote the equitable sharing of the costs associated with providing water service to new development.
- Policy 5.3-I-2: Establish guidelines and standards for water conservation and actively promote the use of water-conserving devices and practices in both new construction and major alterations and additions to existing buildings.
- Policy 5.3-I-3: Ensure that future residents and businesses equitably share costs associated with providing water service to new development in South San Francisco.
- Policy 5.3-G-4: Promote the orderly and efficient operation and expansion of the wastewater system to meet projected needs.
- Policy 5.3-G-5: Promote the equitable sharing of the costs associated with providing wastewater service to new development.
- Policy 5.3-G-6: Maintain environmentally appropriate wastewater management practices.
- Policy 5.3-I-5: Ensure that future residents and businesses equitably share costs associated with providing wastewater service to new development in South San Francisco.
- Policy 5.3-I-7: Encourage new projects in the *East of 101 Area Plan* that are likely to generate large quantities of wastewater to lower treatment needs through recycling, pretreatment, or other means as necessary.
- Policy 8.3-G-1: Reduce the generation of solid waste, including hazardous waste, and recycle those materials that are used to slow the filling of local and regional landfills, in accord with the California Integrated Waste Management Act of 1989.
- Policy 8.3-I-1: Continue to work toward reducing solid waste, increasing recycling, and complying with the San Mateo County Integrated Waste Management Plan.

East of 101 Sewer System Management Plan

The City completed a Sewer System Management Plan for the east portion of the City (East of 101 Area) in September 2002 with subsequent updates in 2007 and 2011. The updates identified capacity deficiencies in the existing wastewater collection system and recommended improvements intended to mitigate deficiencies and serve future redevelopments.

Recognizing the importance of planning, developing, and financing system facilities to provide reliable sewer collection service to existing customers and for servicing anticipated growth, the City's latest Sewer System Management Plan was revised and adopted in November 2019. The purpose of the Sewer System Management Plan is to provide a plan and schedule to manage, operate, and maintain all parts of the sanitary sewer system. The primary objective is to eliminate sanitary sewer overflows and mitigate any sanitary sewer overflows that occur.

Climate Action Plan[63]

The City's CAP, adopted in 2014 and discussed in greater detail in Section 4.4, *Greenhouse Gas Emissions*, of this draft EIR includes goals, policies, and strategies to reduce the City's GHG emissions, in compliance with AB 32 and SB 375.

The CAP provides guidance for a scientific and regulatory framework, a GHG emissions inventory, a GHG reduction strategy, adaptation and resiliency, and implementation. The CAP incorporates several policies regarding water usage and diversion of solid waste, including the policies listed below.

- Measure 5.1: Develop a waste reduction strategy to increase recycling and reuse of materials to achieve a 75% diversion of landfilled waste by 2020.
  - Continue to enforce the existing construction and demolition recycling ordinance, requiring 100% of inert waste and 65% of non-inert waste to be recycled from all eligible projects.
- Measure 6.1: Reduce water demand. Revitalize implementation and enforcement of the Water Efficient Landscape Ordinance by undertaking the following:
  - Establishing a variable-speed pump exchange for water features.
  - Limiting turf area in commercial and large multi-family projects.
  - Restricting hours of irrigation to occur between 3:00 a.m. and two hours after sunrise.
  - Installing irrigation controllers with rain sensors.
  - Landscaping with native, water-efficient plants.
  - Installing drip irrigation systems.
  - Reducing impervious surfaces.
- Measure 6.2: Provide alternative water resources for irrigation.
  - Create water policies for the stormwater management strategy that seek to capture storm runoff (e.g., bioswale, rainwater collection, and irrigation programs).
  - Continue to implement the City's Water Efficient Landscape Guidelines.

The CAP includes a Development Checklist for City staff to use to identify applicable CAP measures for discretionary projects and required mitigation standards. The Development Checklist serves as the summary of project-level standards from the CAP. Criteria applicable to utilities and service systems include, but are not limited to, the following questions:

- Will certification of the building be sought under Leadership in Energy and Environmental Design (LEED) or other green building criteria?
- Will any water features exceed CALGreen standards?
- Will the project incorporate low-impact development practices?
- Will any xeriscaping be installed?
- Will captured rainwater or graywater be used for irrigation?

[63] City of South San Francisco. 2014. City of South San Francisco Climate Action Plan. Prepared by PMC. Available: at https://www.ssf.net/home/showdocument?id=5640. Accessed: May 8, 2020.

City of South San Francisco Municipal Code

The South San Francisco Municipal Code, chapter 14, *Water and Sewage*, establishes regulations including, but not limited to, stormwater management and control, water quality control, sewer rates, sewer lateral construction, maintenance, and inspection, and associated impact fees for use of the City's water and sewage utilities. Specifically, section 4, *Stormwater Management and Discharge Control*, is intended to protect and enhance the water quality of the City's watercourses, water bodies, and wetlands in a manner that is pursuant to and consistent with the Clean Water Act. The purpose of this section is to eliminate non-stormwater discharges to the separate municipal storm sewer, control the discharge to the separate municipal storm sewers from spills, dumping or disposal of materials other than stormwater, and reduce the pollutants in stormwater discharges to the maximum extent practicable. In addition, the City Municipal Code, chapter 15, section 60, *Recycling and Diversion of Debris from Construction and Demolition*, establishes regulations for recycling and the diversion of debris generated from construction and demolition. Specifically, the code details diversion requirements, such as submitting and completing a waste management plan, directing 100 percent of building materials to reuse or recycling facilities approved by the City, and either recycling all mixed debris to recycling facilities or separating/directing non-building materials to recycling facilities at a diversion rate of 65 percent.

4.10.10.2 Significance Criteria

Based on Appendix G of the CEQA Guidelines, the proposed project would have a significant utilities impact if it would:

- Require or result in the relocation or construction of new or expanded water, wastewater treatment, stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects;
- Have insufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years;
- Result in a determination by the wastewater treatment provider that serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments;
- 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; or
- Fail to comply with federal, state, and local management and reduction statutes and regulations related to solid waste.

4.10.10.3 Approach to Analysis

Evaluation of the proposed project is based on the wet utilities memorandum and the sanitary sewer analyses prepared for the proposed project.[64,65] In addition, evaluation of the proposed project is based on dry utilities and wet utilities demand and generation estimates provided by the project sponsor. The estimate of solid waste that would be generated by the proposed project is based on generation rates provided by CalRecycle.

---

[64] BKF. 2020. *701 and 751 Gateway Boulevard, South San Francisco Wet Utilities*. March 5.
[65] BKF. 2020. *751 Gateway Blvd – Sanitary Sewer Analyses*. March 27.

4.10.10.4 Impact Evaluation

Impact UT-1: The proposed project would not require or result in the relocation or construction of new or expanded water, wastewater treatment, stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects. (*Less than Significant*)

Existing water, stormwater, sanitary sewer system, natural gas, electricity, and telecommunications facilities (i.e., lines) would continue to the serve the project site. New on-site facilities would be connected to new services through the installation of new, localized connections. Expansion or an increase in capacity of off-site infrastructure would occur as required by the utility providers. The project could include off-site infrastructure improvements outside of the project site but within the Gateway Campus.

Based on the proposed on-site and off-site utility infrastructure described below, implementation of the project would result in the construction of utility facilities.

- **Potable Water**: New water utilities would be placed around the perimeter of the project site and throughout the site. A new 6-inch lateral would connect to the existing 12-inch lateral on the project site. Two new 8-inch laterals for fire needs would be constructed as part of the project. One 8-inch lateral would connect to the existing 12-inch lateral on the project site. The other 8-inch lateral would connect to the 12-inch water main in Gateway Boulevard.
- **Stormwater**: The existing 18-inch storm pipe on the project site would be relocated around the proposed building and service and loading yard. New storm drain collector pipes and biotreatment areas (discussed above) would be constructed within the project site to drain to the existing 18-inch storm drain line in Gateway Boulevard.
- **Sanitary Sewer System**: The 12-inch gravity pipe outfall in Gateway Boulevard may need to be upsized as part of the proposed project. A new 8-inch lateral would be constructed on the project site to serve the proposed building. In addition, the existing 8-inch lateral that serves the 701 Gateway Boulevard building would need to be replaced with a 10-inch lateral.
- **Natural Gas and Electric**: The project would construct 4-inch electrical conduits to connect to the existing electricity lines in Gateway Boulevard. In addition, the project would construct a 4-inch natural gas lateral to connect to a new natural gas meter that would connect to the existing 4-inch natural gas line in Gateway Boulevard.
- **Telecommunications**: The project would construct 3- to 4-inch communication conduits to connect to the existing communication lines in Gateway Boulevard.

The installation or expansion of utility facilities would require excavation, trenching, soil movement, and other activities that are typical of development projects in South San Francisco, as discussed in detail in this draft EIR as part of the assessment of overall project impacts. As discussed in Section 4.2, *Air Quality*, construction of the proposed project, including construction or expansion of utilities as a component of the proposed project, would not generate significant fugitive dust and criteria air pollutants, violate an air quality standard, contribute substantially to an existing or projected air quality violation, or result in a cumulatively considerable net increase in criteria air pollutants. Implementation of Mitigation Measure AQ-2 would control fugitive dust and reduce this impact to a less-than-significant level. As discussed in Section 4.8, *Noise and Vibration*, construction of the proposed project, including construction or expansion of utilities as a component of the proposed project, would not result in a substantial temporary or periodic increase in ambient noise levels and would not violate the applicable local standards. Implementation of Mitigation Measure NOI-1 would reduce construction noise and reduce this impact to a less-than-significant level. As discussed in Section 4.9, *Transportation and Circulation*, construction of the proposed project, including construction or expansion of utilities as a component of the proposed project, would not cause significant impacts on the transportation and circulation network because construction activities would be temporary, and the flow of traffic would not be disrupted. In summary, impacts related to the construction of new utility facilities for the proposed project are addressed as part of the analysis of construction impacts for the proposed project as a whole. The installation or expansion of any utility facilities for the project would not result in additional significant impacts that are not otherwise disclosed elsewhere in this draft EIR.

The City's Sewer System Management Plan provides a discussion of the East of 101 Sewer Impact Fee Fund, which uses fees to improve the sewer infrastructure where new business development has shown the need for an improved sewer system, and the City's Capital Improvement Program. The City's Capital Improvement Program was adopted by the City on June 15, 2017, to assist the City in planning and constructing the collection system improvements through the 2040 scenario, and presents the methodologies for developing equitable distribution of costs. The capital improvement costs account for project-related costs associated with engineering design, project administration, construction management, inspection, and legal costs. The Sewer System Management Plan indicates that capacity allocation analysis is needed to identify improvement funding sources, and to establish a nexus between development impact fees and improvements needed to service growth. In compliance with the provisions of the Mitigation Fee Act, Government Code sections 66000, et. seq. (also known as AB 1600), the analysis differentiates between the needs of existing users and those of anticipated future developments. If required, the costs of capital improvements would be captured through payment of the City's Sewer System Capacity Study and Improvement Fee (the "Sewer Capacity Fee"), based on the square footage of proposed project new uses, pursuant to the City's Master Fee Schedule and Title 14 "Water and Sewage" of the Municipal Code.

Based on the analysis above, the project would not require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects and this impact would be ***less than significant***. No mitigation is required.

Impact UT-2: The proposed project would have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years. (*Less than Significant*)

Construction

Demolition and construction activities for the project would result in a temporary increase in water demand. Activities such as dust control, concrete mixing, equipment and site cleanup, irrigation for the establishment of plants and landscaping, and water line testing and flushing would occur periodically throughout the project's construction period. Water demand during construction would be minimal and temporary, and would be served utilizing the same infrastructure and sources described in the section below as would be utilized during project operation. The water demand generated during project construction would be less than the water demand generated during project operation. Therefore, sufficient water supplies are available to serve the project during construction and this impact would be ***less than significant***. No mitigation is required.

Operation

Table 4.10-6 provides an estimate of the existing and proposed water demand at the project site. As shown, the proposed project would result in a net increase in water demand of approximately 15,132 gallons per day, or 17 acre-feet per year.

The project site is served by the California Water Service Company (Cal Water), and is located in the South San Francisco District, which includes South San Francisco, Colma, a small portion of Daly City, and Broadmoor.[66] Cal Water provides water through a combination of purchased water from the

Table 4.10-6. Estimated Existing and Proposed Water Demand

Feature	Existing/ Proposed Project (square feet)	Generation Rate[1]	Water Demand (gallons per day)
Existing uses at 701 Gateway Boulevard (to remain)	170,235	0.0547 gallon per day per square foot (for office use)	9,312
Proposed uses at 751 Gateway Boulevard	208,800		
R&D	118,000	0.082 gallon per day per square foot (for lab use)	9,676
Office	78,700	0.0547 gallon per day per square foot (for office use)	4,305
Retail (including café and fitness center)	12,100	0.110 gallon per day per square foot (for amenity use)	1,331
Total Project Net Increase in Water Demand			**15,132**

Notes:
1 The generation rates are based on Table 18-2 in the draft EIR prepared for the Genentech Master Plan Update available at http://weblink.ssf.net/WebLink/0/edoc/425577/18%20-%20Utilities.pdf. For the purposes of this analysis, the generation rates were converted from per year to per day.

San Francisco Public Utilities Commission (SFPUC) and groundwater from Cal Water owned wells. The water purchased from SFPUC provides approximately 85 percent of the District's water demand each year, is shared among three Cal Water districts (Bear Gulch, Mid-Peninsula, and South San Francisco), and is delivered through a network of pipelines, tunnels, and treatment plants. The amount of water allocated to the South San Francisco district varies each year depending on hydrology (i.e. amount of water supply available), and physical facilities, among other parameters. However, SFPUC historically has been able to meet the water demand in its service area (including drought years) through its watersheds, which include the Tuolumne River watershed, Alameda Creek watershed, and San Mateo County watershed. Groundwater from the Westside Basin has historically supplied anywhere between ten to fifteen percent of the South San Francisco district's water demand utilizing wells owned by Cal Water. Together, the water provided by the SFPUC and Cal Water's groundwater wells, generates a water supply of approximately 40,225 acre-feet for the three Cal Water Districts.

[66] Bay Area Water Supply and Conservation Agency. n.d*. California Water Service—South San Francisco District.* Available: https://bawsca.org/members/profiles/cws-san-francisco. Accessed: March 9, 2020.

The project would increase water demand compared to existing conditions. However, the project would not increase demand beyond that anticipated in the UWMP. Specifically, the total annual potable water demand of the project (approximately 17 acre-feet) represents approximately 0.24 percent and 0.19 percent, of the 2015 and 2040 potable water demand, respectively, in the South San Francisco District (7,064 acre-feet and 8,901 acre-feet).[67] In addition, according to the UWMP, the South San Francisco District would have adequate supplies through the planning horizon year of 2040 during average rainfall years for the City's and the project's water demands utilizing the existing water purchased and supplied through the SFPUC and Cal Water's groundwater wells. The project would represent approximately 0.04 percent of the projected 41,767 acre-feet of water to be supplied to Cal Water's three districts in 2040. In addition, the proposed project would comply with all applicable City and state water conservation measures, including title 24, part, 6, the California Energy Code, with baseline standard requirements for energy efficiency; the 2019 Building Energy Efficiency Standards; and the 2019 CALGreen Code. Furthermore, the SFPUC and Cal Water have plans to develop additional water supply sources in order to meet the increasing water demand and dry-year demands throughout the San Francisco peninsula, including the City; these projects include the Alameda Creek Recapture Project, Regional Groundwater Storage and Recovery Project, and the Bay Area Regional Desalination Project which would increase the amount of water supply available, and would ultimately help to address water demand for the proposed project in the future. Furthermore, the SFPUC and Cal Water have plans to develop additional water supply sources in order to meet increasing water demand and dry-year demands; these projects include the Alameda Creek Recapture Project, Regional Groundwater Storage and Recovery Project, which would help to offset water demand for the proposed project. Therefore, the water demand generated by the proposed project would not exceed the supply or capacity of the water utility; this would be a ***less than significant*** impact. No mitigation is required.

Impact UT-3: The proposed project would result in a determination by the wastewater treatment provider that 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. (*Less than Significant*)

Construction

Demolition and construction activities for the project would result in a temporary increase in wastewater generation as a result of on-site construction workers. Wastewater generation during construction would be minimal and temporary. In addition, construction workers typically use portable toilets, which do not flow to the wastewater conveyance system. Therefore, sufficient wastewater treatment capacity is available to serve the project during construction and this impact would be ***less than significant***. No mitigation is required.

Operation

According to the sanitary sewer analyses prepared for the proposed project, the wastewater collection system that serves the project site is owned and operated by the City. The City's collection system includes a 10-inch force main that extends south along Gateway Boulevard from Lift Station No. 2 and

[67] California Water Service. 2016. *2015 Urban Water Management Plan—South San Francisco District*. Available: https://www.calwater.com/docs/uwmp2015/bay/South_San_Francisco/2015_Urban_Water_Management_Plan_Final_(SSF).pdf. Accessed: March 9, 2020.

it outfalls to the 12-inch sewer main in Gateway Boulevard adjacent to the project site. The 12-inch gravity line extends west to connect to a 15-inch line in Gateway Boulevard, which conveys sewer flow to the south to East Grand Avenue via an 18-inch main. The 18-inch main continues to the northeast along East Grand Avenue until it discharges to a 27-inch main. All sewer flows generated are ultimately conveyed to Lift Station No. 4, which discharges to the Water Quality Control Plant (WQCP) where it is treated and discharged to the San Francisco Bay. According to the 2017 Master Plan, Lift Station 4 can convey 160 percent of the expected 2040 sewer peak flows with one pump out of service (which corresponds to a surplus of 4.9 million gallons per day).

The 12-inch main in Gateway Boulevard receives flow from Lift Station No. 2. Lift Station No. 2 has a 10-inch force main (approximately 610 feet) that connects to the 12-inch line serving the project site. Lift Station No. 2 serves sewershed Basins 1, 2 and 14; it is approximately 194 acres. Downstream of Lift Station No. 2, the 12-inch main serves additional parcels in Basin 4, which drain by gravity to the 12-inch main. Altogether, the 12-inch main in Gateway Boulevard accepts 275 acres of sewershed.

A total of four parcels contribute to the flow in the Gateway Boulevard 12-inch main in addition to flow from Lift Station No. 2: 700, 701, 750, and 751 Gateway Boulevard. The proposed project would result in a peak dry weather flow of 149,930 gallons per day (0.16 million gallons per day) and a peak wet weather flow of 249,883 gallons per day (0.26 million gallons per day). The increase in flow from the proposed project would be minimal compared to the overall flow through the existing system, which would have peak dry weather flow of 2,320,331 gallons per day (2.32 million gallons per day) and a peak wet weather flow of 4,333,885 gallons per day (4.33 million gallons per day). With the proposed project, the existing system would still operate within criteria established in the 2017 Master Plan to assess capacity impacts.

As discussed above, wastewater from the proposed project would be treated at the WQCP, which is monitored by the San Francisco Bay RWQCB to ensure compliance with the facility's NPDES wastewater discharge permit. The WQCP design capacity for average dry weather flow is 13 million gallons per day.[68] The average dry weather flow through the facility is 9 million gallons per day.[69] Peak wet weather flows can exceed 60 million gallons per day. With implementation of the project, the WQCP would still operate below its design capacity. Therefore, sufficient wastewater treatment capacity is available to serve the project during operation and this impact would be ***less than significant***. No mitigation is required.

Impact UT-4: The proposed project would not 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. In addition, the proposed project would comply with federal, state, and local management and reduction statutes and regulations related to solid waste (*Less than Significant*)

Construction

Demolition and construction activities for the project would result in a temporary increase in solid waste generation. Solid waste generation would occur periodically during construction. However, the

[68] Schumacker, Brian, Plant Superintendent. City of South San Francisco-San Bruno Water Quality Control Plant, South San Francisco, CA. May 5, 2020. e-mail communication to Atteberry, Devan.

[69] City of South San Francisco Public Works. 2020. Water Quality Control Plant. Available: https://www.ssf.net/departments/public-works/water-quality-control-plant. Accessed: April 28, 2020.

increase would be minimal and temporary. In addition, 100 percent of all inert solids (building materials) and 65 percent of non-inert solids (all other materials) would be recycled as required by the City under Chapter 15.60 of the South San Francisco Municipal Code. Therefore, the proposed project would not generate solid waste in excess of state or local standards or in excess of the capacity of local infrastructure during construction and would not conflict with solid waste regulations; this impact would be ***less than significant***. No mitigation is required.

Operation

The project site would continue to be served by the South San Francisco Scavenger Company and Blue Line Transfer Inc. The South San Francisco Scavenger Company would transport all solid waste generated at the project site to the Blue Line Transfer Facility (approximately one mile south of the project site). This facility has a permitted capacity of 2,400 tons per day.[70] Any trash remaining after the usable materials have been separated at the transfer facility are transported to the Corinda Los Trancos (Ox Mountain) Sanitary Landfill or the Newby Island Sanitary Landfill.

As of 2015 (the most recent year for which data are available), the Ox Mountain Sanitary Landfill had a remaining capacity of approximately 22.18 million cubic yards.[71] Ox Mountain Sanitary Landfill has a maximum permitted disposal capacity of 3,598 tons per day and is estimated to close in 2034. As of 2014 (the most recent year for which data are available), the Newby Island Sanitary Landfill had a remaining capacity of approximately 21.2 million cubic yards.[72] The Newby Island Sanitary Landfill has a maximum permitted disposal capacity of 4,000 tons per day and is estimated to close in 2041.

Operation of the proposed project would generate approximately 6,798 pounds of solid waste per day (approximately 3.4 tons of solid waste per day).[73,74] The solid waste generated by the proposed project would represent approximately 0.09 percent of the maximum daily intake allowed at each of the landfills. The proposed project would not be a substantial contributor to the City's solid waste at Blue Line Transfer, Ox Mountain Sanitary Landfill, or Newby Island Sanitary Landfill.

Solid waste disposal and recycling in the City is regulated by the Municipal Code, particularly Chapters 8.16 and 8.28. As neither of these chapters establishes quantitative disposal or recycling rates, the project site would not be subject to diversion requirements. However, under the Municipal Code, the proposed project would be required to have its solid waste, including construction, demolition debris, and recyclable materials, collected by the South San Francisco Scavenger

---

[70] California Department of Resources Recycling and Recovery. 2020. *Blue Line MRF and TS*. Available: https://www2.calrecycle.ca.gov/swfacilities/Directory/41-AA-0185. Accessed: March 9, 2020.

[71] California Department of Resources Recycling and Recovery. 2020. *Corinda Los Trancos Landfill (Ox Mtn).* Available: https://www2.calrecycle.ca.gov/swfacilities/ Directory/41-AA-0002/. Accessed: March 9, 2020.

[72] California Department of Resources Recycling and Recovery. 2020. *Newby Island Sanitary Landfill*. Available: https://www2.calrecycle.ca.gov/SWFacilities/ Directory/43-AN-0003/Detail. Accessed: March 9, 2020.

[73] California Department of Resources Recycling and Recovery. 2020. *South San Francisco Jurisdiction Diversion/Disposal Rate Summary*. Available: https://www2.calrecycle.ca.gov/LGCentral/DiversionProgram/JurisdictionDiversionPost2006. Accessed: March 9, 2020. Solid waste generation was estimated for the project using the 2015 generation rate of 9.3 pounds per employee per day. There would be approximately 731 employees as part of the proposed project; therefore, (9.5 pounds per day/employee) x (731 employees) = 6,798.3 pounds of waste per day.

[74] For the purposes of this analysis, the 2015 jurisdiction diversion/disposal rate report year (the most recently approved report year) was used; the 2020 report year is still pending review.

Company. Additional health and sanitation requirements set forth in the Municipal Code would be met by South San Francisco Scavenger Company. In addition, eligible projects (2,000 square feet or more) must submit a Waste Management Plan. AB 939 requires that local jurisdictions divert at least 50 percent of all solid waste by 2000. Furthermore, as described in the CAP, Measure 5.1, the project sponsor would be required to develop a waste reduction strategy to increase recycling and reuse of materials to achieve a generalized rate of 75 percent diversion of landfilled waste.

Based on the analysis above, the project would not generate solid waste in excess of state or local standards or in excess of the capacity of local infrastructure during operation and would not conflict with solid waste regulations; this impact would be ***less than significant***. No mitigation is required.

Impact C-UT-1: The proposed project, in combination with past, present, and reasonably foreseeable future projects, would not result in a significant cumulative impact on utilities and service systems. (*Less than Significant*)

The cumulative geographic contexts for utilities and service systems are the service territories of the utility providers. Over time, growth throughout the City will result in increased demand for water, wastewater treatment, solid waste disposal, natural gas, electricity, and telecommunications. As shown in Table 4.10-2 in Section 4.10.7, *Population and Housing*, of this draft EIR, ABAG projects the City's population will increase by approximately 11,910, from 68,105 in 2020 to 80,015 in 2040. In addition, ABAG projects the number of jobs in the City will increase by 7,865, from 46,365 in 2020 to 54,230 in 2040. Citywide growth would also generate increased demand for utilities. The cumulative projects located within approximately 0.5 mile of the project site are described in Section 4.1.5, *Approach to Cumulative Impact Analysis*, of this draft EIR and shown in Figure 4.1-1.

Potable Water

The cumulative projects would increase demands on water supplies as well as water infrastructure and treatment facilities. The reasonably foreseeable future projects that involve large commercial, residential, or office uses would be required to request a WSA from the California Water Service Company to identify project-specific impacts.[75] California Water Service Company has incorporated the demand from other development projects in its future water service projections. As discussed under Impact UT-2, according to the UWMP, the South San Francisco District would have adequate supplies through the planning horizon year of 2040 during average rainfall years for the City's and the project's water demands utilizing existing water infrastructure. As mentioned previously, the project would represent approximately 0.04 percent of the projected 41,767 acre-feet of water to be supplied to Cal Water's three districts in 2040. In addition, SFPUC and Cal Water have plans to expand water supplies through several water supply development projects, which would ultimately help to address increasing water demand, and offset water demand generated by the project. Furthermore, the proposed project and the reasonably foreseeable future projects would comply with all applicable City and state water conservation measures, including title 24, part, 6, the California Energy Code, with baseline standard requirements for energy efficiency; the 2019 Building Energy Efficiency Standards; and the 2019 CALGreen Code. For these reasons, the proposed

[75] A WSA is required for projects with, among other things: (1) demand equivalent to 500 residential units, (2) a shopping/business center that employs more than 1,000 people or has a floor space of 500,000 square feet or greater, or (3) a commercial office building with more than 1,000 employees or floor space totaling 250,000 square feet or greater. If prepared for a project, the WSA determines if the existing water supply is adequate for the proposed project.

project, in combination with other past, present, and reasonably foreseeable future projects, would not result in a significant cumulative water supply or water supply facilities impact. The cumulative impact would be ***less than significant***. No mitigation is required.

Stormwater

The cumulative projects would be likely constructed on infill sites in highly urbanized areas where there is a substantial amount of existing impervious surface area. All cumulative projects would be required to include post-construction stormwater management features, such as LID measures, to reduce flows to pre-project conditions. New projects would be subject to the requirements of the San Francisco Bay MS4 Permit, the Construction General Permit, and the City's General Plan and Municipal Code related to protecting water resources. Thus, the proposed project, in combination with the reasonably foreseeable future projects, would not substantially increase impervious surfaces compared to existing conditions. Post-construction peak stormwater flows would not increase compared to existing conditions. Similar to the proposed project, the reasonably foreseeable future projects would be required to comply with all BMPs and the City's standard conditions regarding stormwater drainage and surface runoff detention measures (including Condition No. 13, Condition No. 23, and Condition No. 24). For these reasons, the proposed project, in combination with other past, present, and reasonably foreseeable future projects, would not result in a significant cumulative stormwater facilities impact. The cumulative impact would be ***less than significant***. No mitigation is required.

Wastewater

The cumulative projects would increase the amount of water used and increase demands on wastewater infrastructure and treatment facilities. The Sewer System Management Plan projects future land use development in the East of 101 Area to the year 2040, and identifies components for the system that would require improvement to support future growth. Those improvements include capacity (pipe diameter) upgrades, slope improvements, and lift station improvements. Similar to the proposed projects, the reasonably foreseeable future projects would be required to contribute to the Capital Improvement Program. Furthermore, as a standard condition of approval, the City would require the proponents of each project to provide project-specific sewer capacity studies. For these reasons, the proposed project, in combination with other past, present, and reasonably foreseeable future projects, would not result in a significant cumulative wastewater generation and facilities impact. The cumulative impact would be ***less than significant***. No mitigation is required.

Natural Gas, Electricity, and Telecommunications

The cumulative projects would likely be constructed on infill sites in highly urbanized areas; it is anticipated that these projects would not substantially increase electric power, natural gas, and telecommunications demands. Similar to the proposed project, the cumulative projects would comply with all applicable City and state water conservation measures, including title 24, part, 6, the California Energy Code, with baseline standard requirements for energy efficiency; the 2019 Building Energy Efficiency Standards; and the 2019 CALGreen Code. For these reasons, the proposed project, in combination with other past, present, and reasonably foreseeable future projects, would not result in a significant cumulative natural gas, electricity, and telecommunications demand and facilities impact. The cumulative impact would be ***less than significant***. No mitigation is required.

Solid Waste

In 2015 (the most recent year for which approved data are available), the average per capita residential disposal rate in South San Francisco was 6.9 pounds per day, which met South San Francisco's target identified by CalRecycle of 6.9 pounds per day.[76] For the employment sector, the average disposal rate was 9.3 pounds per day per employee, which did not meet the 9.0 pounds per day per employee target. The cumulative projects would incrementally increase the amount of solid waste generated by increasing the number of employees and residents in the City; excavation, demolition, and remodeling activities associated with growth would also increase total solid waste generation. However, the increasing rate of diversion citywide, achieved through recycling, composting, and other methods, would decrease the total amount of waste deposited in landfills. The proposed project, in combination with the reasonably foreseeable future projects, would not cause a significant impact on regional landfill capacity because the projects would be required to comply with the City's waste reduction and diversion measure (CAP Measure 5.1). In addition, 100 percent of all inert solids (building materials) and 65 percent of non-inert solids (all other materials) generated during construction of the cumulative projects would be recycled as required by the City under Chapter 15.60 of the South San Francisco Municipal Code, similar to the proposed project. Compliance with such regulatory requirements would reduce the project's and the cumulative projects' contribution to overall solid waste volumes generated during construction and operation. Given the future long-term capacity available at Ox Mountain Sanitary Landfill, Newby Island Sanitary Landfill, and other area landfills, the proposed project and cumulative projects would be served by a landfill with adequate permitted capacity to accommodate their solid waste disposal needs. For these reasons, the proposed project, in combination with other past, present, and reasonably foreseeable future projects, would not result in a solid waste impact. The cumulative impact would be ***less than significant***. No mitigation is required.

4.10.11 Wildfire

4.10.11.1 Regulatory Framework

State

Very High Fire Hazard Severity Zones Government Code 51177

Very High Fire Hazard Severity Zones (VHFHSZs) are defined by Government Code section 51177 as areas that have been designated by the director of the California Department of Forestry and Fire Protection (CAL FIRE) as having the highest probability for wildfire. The designation of these zones is based on statewide criteria and the severity of the fire hazard in the area. The zones have characteristics that have been identified by CAL FIRE as major causes for the spread of wildfires, such as fuel load, slope, and weather. Other factors, such as wind, are also considered. Fire Hazard Severity Zone maps are produced and maintained for each county in California.

[76] California Department of Resources Recycling and Recovery. 2020. *South San Francisco Jurisdiction Diversion/Disposal Rate Summary*. Available: https://www2.calrecycle.ca.gov/LGCentral/DiversionProgram/JurisdictionDiversionPost2006. Accessed: March 9, 2020.

State Responsibility Areas Public Resources Code 4102

State Responsibility Areas (SRAs) are defined by PRC section 4102 as areas of the state in which the State Board of Forestry and Fire Protection has determined that the financial responsibility for preventing and suppressing fires lies with the state. Specifically, SRAs are lands in California where CAL FIRE has legal and financial responsibility for wildfire protection. SRA lands are usually unincorporated areas of a county and not federally owned. These areas contain wildland vegetation cover, housing densities lower than three units per acre, and, typically, some sort of watershed or range/forage value. Where SRAs encompass developments or a built environment, the local government agency assumes responsibility through a local responsibility area (LRA) or contracts with CAL FIRE.

LRAs do not meet the criteria for SRAs or federal responsibility areas. LRAs are typically cities, cultivated agricultural lands, and nonflammable areas in unincorporated portions of a county but can include flammable vegetation and wildland-urban interface areas. LRA fire protection is provided by local fire departments, fire protection districts, county fire departments, or through contract with CAL FIRE.

Regional

County of San Mateo Emergency Operations Plan

The 2015 County of San Mateo Emergency Operations Plan establishes policies and procedures and assigns responsibilities to ensure effective management of emergency response operations within the San Mateo County Operational Area. Under the Emergency Operations Plan, the emergency management organization in San Mateo County identifies potential threats to life, property and the environment, and develops plans and procedures to protect, prevent and mitigate those assets from potential hazards (e.g., wildfires).

Local

South San Francisco General Plan

The 1999 General Plan provides a vision for long-range physical and economic development of the City, provides strategies and specific implementing actions, and establishes a basis for judging whether specific development proposals and public projects are consistent with the City's plans and policy standards. The General Plan contains a Health and Safety Element, which acknowledges and mitigates the risks posed by hazards (e.g., fire). While the General Plan does not include policies specific to wildfire, it includes the following policies applicable to fire risk:

- Policy 8.4-G-1: Minimize the risk to life and property from fire hazards in South San Francisco.
- Policy 8.4-G-2: Provide fire protection that is responsive to citizens' needs.
- Policy 8.4-I-2: Explore incentives or programs as part of a comprehensive fire hazard management program to encourage private landowners to reduce fire hazards on their properties.
- Policy 8.4-I-4:[77] Require site design features, fire-retardant building materials, and adequate access as conditions for approval of development or improvements to reduce the risk of fire in the City.

[77] Policy 8.4-I-4 is misnumbered in the General Plan as the second Policy "8.4-I-3".

4.10.11.2 Significance Criteria

Based on Appendix G of the CEQA Guidelines, the proposed project would have a significant wildfire impact if it is located in or near a state responsibility area or lands classified as very high fire hazard severity zones, and would:

- Substantially impair an adopted emergency response plan or emergency evacuation plan;
- Due to slope, prevailing winds, or other factors, exacerbate wildfire risks and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire;
- Require the installation or maintenance of associated infrastructure, such as roads, fuel breaks, emergency water sources, power lines, or other utilities, that may exacerbate the fire risk or result in temporary or ongoing impacts on the environment; or
- 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.

4.10.11.3 Approach to Analysis

According to CAL FIRE, the City, including the project site, is in a non-VHFHSZ.[78] The nearest VHFHSZ is approximately 5.3 miles southwest of the project site, near the City of Millbrae. In addition, the entire City, including the project site, is in an LRA, not an SRA.[79] The nearest SRA, San Bruno Mountain State and County Park, is approximately 0.5 mile northwest of the project site. Given the project site's proximity to an SRA (i.e., less than 1 mile), the evaluation of the proposed project considers each of the thresholds above. Evaluation of the proposed project is based on CAL FIRE'S Fire Hazard Severity Zone maps, the County of San Mateo's Emergency Operations Plan, and the South San Francisco General Plan.

4.10.11.4 Impact Evaluation

Impact WF-1: The proposed project would not substantially impair an adopted emergency response plan or emergency evacuation plan. (*Less than Significant*)

The project would not include any changes to existing public roadways that provide emergency access to the site or surrounding area. The project would demolish a surface parking lot and construct a seven-story office and R&D building with parking. The existing access to the project site (two driveways on Gateway Boulevard, one driveway from the internal access drive south of the building at 951 Gateway Boulevard, and one driveway on an unnamed street that connects Poletti Way to Gateway Boulevard) would be retained under the proposed project. Emergency vehicle access to the project site would be provided by Gateway Boulevard and the parking lot to be constructed north of the proposed building. In addition, the proposed project would be designed to comply with the California Fire Code and the City Fire Marshal's code requirements that require on site access for emergency vehicles, a standard condition for any new project approval.

---

[78] California Department of Forestry and Fire Protection. 2007. *San Mateo County Fire Hazard Severity Zones in SRA.* Available: https://osfm.fire.ca.gov/divisions/wildfire-planning-engineering/wildland-hazards-building-codes/fire-hazard-severity-zones-maps/. Accessed: February 19, 2020.

[79] California Department of Forestry and Fire Protection. 2008. *San Mateo County Very High Fire Hazard Severity Zones in LRA as Recommended by CAL FIRE*. Available: https://osfm.fire.ca.gov/divisions/wildfire-planning-engineering/wildland-hazards-building-codes/fire-hazard-severity-zones-maps/. Accessed: February 19, 2020.

During project construction, traffic levels would increase minimally, which is not expected to degrade traffic operations. Furthermore, emergency response access during the construction period would not be impeded significantly. The project would not involve development of a structure that would impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan. No streets would be closed, rerouted, or altered substantially. The 731 net new employees (refer to Section 4.10.7, *Population and Housing,* of this draft EIR) may slightly increase demand during an evacuation. Therefore, the project would not interfere with the County of San Mateo's Emergency Operations Plan, the City's Community Emergency Response Team (CERT) or any evacuation route.[80] Adequate access to the project site and surrounding area would be maintained. The City further requires that upon completion of the proposed building, occupancy is not allowed until a final inspection is made by the SSFFD, which includes a review of the emergency evacuation plans. Therefore, the proposed project would have a ***less-than-significant*** impact on a statewide or locally adopted emergency response plan or emergency evacuation plan. No mitigation is required.

Impact WF-2: The proposed project would not, because of slope, prevailing winds, or other factors, exacerbate wildfire risks and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire. (*Less than Significant*)

As previously stated, the project site is not in a VHFHSZ or an SRA; therefore, the risk of wildfire is low. In addition, the project site and surrounding buildings are separated by paved parking areas, landscaping, and building setbacks that reduce wildfire risks. Furthermore, the project site is relatively flat and would be properly irrigated and maintained, which would also reduce the risk of wildfire. Therefore, there would be a ***less-than-significant*** impact with respect to exposing project employees to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire. No mitigation is required.

Impact WF-3: The proposed project would not require the installation or maintenance of associated infrastructure, such as roads, fuel breaks, emergency water sources, power lines, or other utilities, that may exacerbate the fire risk or that may result in temporary or ongoing impacts on the environment. (*No Impact*)

The project would be served by existing water, wastewater, stormwater, natural gas, electric, and telecommunications infrastructure. New on-site facilities would be connected to new services through the installation of new, localized connections. Expansion or an increase in capacity of off-site infrastructure would occur as required by the utility providers. The project could include off-site infrastructure improvements outside of the project site but within the Gateway Campus.

The proposed project would not require the installation or maintenance of any infrastructure that would exacerbate fire risk. The project, including infrastructure upgrades, would be completed in conformance with the South San Francisco Fire Code to reduce potential fire hazards. Therefore, the proposed project would not require the installation or maintenance of infrastructure that would exacerbate the fire risk or result in temporary or ongoing impacts on the environment and there would be ***no impact***. No mitigation is required.

---

[80] The CERT Program trains individuals within the City's neighborhoods, businesses and industries in emergency preparedness and basic disaster response techniques. After graduating from training, the CERT team meets monthly to train on various emergency response skills such as shelter operations, communications, or emergency operations center support.

Impact WF-4: The proposed project would not 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. (*No Impact*)

The proposed project would be located on a developed parcel within the Gateway Campus, which includes office, R&D, childcare, and amenity uses. The topography of the project site and surrounding area is relatively flat. A portion of the project site would be graded and leveled during construction. Therefore, the proposed project would not expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of post-fire slope instability or drainage changes and there would be ***no impact***. No mitigation is required.

Impact C-WF-1: The proposed project, in combination with past, present, and reasonably foreseeable future projects, would not result in a significant cumulative impact on a statewide or locally adopted emergency response plan or emergency evacuation plan. (*Less than Significant*)

Although the City utilizes the Countywide Emergency Operations Plan, actual emergency response and evacuation would be coordinated through the City CERT program. Therefore, the cumulative geographic context for wildfire is the City. The cumulative projects located within approximately 0.5 mile of the project site are described in Section 4.1.5, *Approach to Cumulative Impact Analysis*, of this draft EIR and shown in Figure 4.1-1.

The proposed project would result in approximately 731 net new employees at the project site. As discussed in Section 4.10.7, *Population and Housing,* of this draft EIR, the cumulative projects would generate approximately 19,167 employees. The new employees generated by the proposed project and the cumulative projects may increase demand during an evacuation. However, the City requires that upon completion of the proposed building, occupancy is not allowed until a final inspection is made by the SSFFD, which includes a review of the emergency evacuation plans. For these reasons, the proposed project, in combination with other past, present, and reasonably foreseeable future projects, would not result in a significant cumulative impact on a statewide or locally adopted emergency response plan or emergency evacuation plan. The cumulative impact would be ***less than significant***. No mitigation is required.

Chapter 5
Alternatives

5.1 Introduction

This chapter evaluates alternatives to the proposed project and examines the potential environmental impacts associated with each alternative. By comparing these alternatives to the proposed project, the relative environmental advantages and disadvantages of each may be analyzed and weighed. California Environmental Quality Act (CEQA) Guidelines Section 15126.6(a) states that an environmental impact report (EIR) must describe and evaluate a reasonable range of alternatives to the proposed project that would feasibly attain most of the proposed project's basic objectives but would avoid or substantially lessen any identified significant adverse environmental impacts of the proposed project.

The range of alternatives required in an EIR is governed by a "rule of reason" that requires the EIR to set forth only those potentially feasible alternatives necessary to foster informed public participation and an informed and reasoned choice by the decision-making body (per CEQA Guidelines Section 15126.6(f)). Therefore, an EIR does not need to address every conceivable alternative or consider infeasible alternatives. CEQA generally defines "feasible" to mean the ability to be accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, technological, and legal factors (per CEQA Guidelines Section 15364). The following factors may also be considered.

- Site suitability
- Economic viability
- Availability of infrastructure
- General plan consistency
- Other plans or regulatory limitations
- Jurisdictional boundaries
- Ability of the project's proponent to attain site control (per CEQA Guidelines section 15126.6(f)(1))

An EIR does not need to consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative (per CEQA Guidelines Section 15126.6(f)(3)).

Nine alternatives to the project were considered, including the required No Project Alternative. To determine which of the alternatives should be evaluated in this draft EIR, each alternative was screened to determine whether it would meet most of the objectives of the project, reduce any of the significant impacts identified in the draft EIR, and be potentially feasible.

This chapter provides a description of the alternatives considered but rejected, followed by an analysis of the No Project Alternative and the two alternatives selected for evaluation: the Reduced Surface Parking Lot Demolition Alternative and the Reduced Building Footprint Alternative.

5.1.1 Project Objectives

Refer to Section 3.1.1 in Chapter 3, *Project Description*, of this draft EIR for a list of the project objectives that have been identified by the project sponsor.

5.1.2 Significant Impacts of the Project

Based on the analysis provided in Chapter 4 of this draft EIR, the project would have the following significant and unavoidable impacts.

- **Impact GHG-1b: The proposed project would generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment during operation.** The proposed project would result in a net loss of trees, reducing carbon sequestration in the land use sector. Implementation of Mitigation Measure GHG-2 would plant additional trees on existing surface parking lots, but would still result in a net loss of trees. In addition, the proposed project would not achieve the 16.8 percent vehicle miles traveled (VMT) per service population reduction target. The proposed project would be subject to regulatory programs related to fuel and vehicle efficiency as well as vehicle electrification. In addition, implementation of Mitigation Measure TR-1, as discussed in Section 4.9, *Transportation and Circulation*, would contribute a fair share towards funding the design and construction of off-site improvements to support the proposed project's first- and last-mile transit connection strategies, which are necessary to support reductions in the number of trips made by automobile. These improvements include fair-share contributions towards the City's cost of upgrading sidewalks, upgrading and extending bicycle and pedestrian pathways, providing a more direct connection to on-street shuttle stops, participating in first/last shuttle programs, and striping unmarked crosswalks contributing to bicycle and pedestrian infrastructure. However, the lead agency cannot determine with certainty that implementation of Mitigation Measure TR-1 would reduce the proposed project's VMT to a less-than-significant level because there are a range of GHG reductions associated with the measures in TR-1, making precise quantification of reductions difficult. Consequently, although emissions from the stationary-source, area, energy, waste, and water sectors would generally be consistent with the Bay Area Air Quality Management District's (BAAQMD's) stationary threshold or the scoping plan and regulatory programs, land use and mobile-source emissions from the proposed project would not be consistent with the scoping plan measures outlined to reduce GHG emissions consistent with the State's goals. Therefore, operational GHG impacts would be significant and unavoidable with mitigation.
- **Impact GHG-2: The proposed project would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.** Stationary-source emissions would be below BAAQMD's stationary-source threshold. In addition, the proposed project would achieve U.S. Green Building Council Leadership in Energy and Environmental Design (LEED) Gold certification and implement sustainability measures, such as waste diversion programs and water reduction measures, consistent with the 2017 scoping plan. This would reduce GHG emissions and associated impacts from area energy, water, and waste sources to less-than-significant levels. These reductions would help the State meet its GHG reduction goals. However, the proposed project would not be consistent with the scoping plan's overall goal of avoiding losses in carbon sequestration, given the net tree loss despite implementation of Mitigation Measure GHG-2. In addition, implementation of Mitigation Measure TR-1 would reduce mobile-source emissions during operation but would not reduce

emissions enough to meet the 16.8 percent VMT per service population reduction target developed by CARB. Therefore, the GHG impacts of the proposed project would be significant and unavoidable with mitigation because the project would not be consistent with State goals to reduce GHG emissions.

- **Impact TR-1: Existing home-based work (HBW) VMT per employee in the travel demand model transportation analysis zone (TAZ) that encompasses the project result in greater than 16.8 percent below the regional average HBW VMT per employee under existing plus project and cumulative plus project conditions.** The project would generate approximately 16.2 HBW VMT per employee under existing conditions, which is greater than the per-employee significance threshold of 11.8 HBW VMT (based on a VMT rate of a reduction of 16.8 percent below the regional average of 14.2 HBW VMT per employee). Therefore, the project would have a significant impact on VMT under existing plus project conditions. Under cumulative conditions, the project would generate approximately 14.0 HBW VMT per employee, which is greater than the per-employee significance threshold of 12.1 HBW VMT (based on a VMT rate 16.8 percent below the regional average of 14.6 HBW VMT per employee). Therefore, the project would have a significant impact on VMT under cumulative plus project conditions. Mitigation Measure TR-1 would support and enhance the effectiveness of the project's last-mile transit connection strategies, but would be unlikely to substantially reduce HBW VMT per-employee, and would aid in reducing project auto travel demand. It is appropriate mitigation under both the existing plus project and cumulative plus project conditions; however, its effectiveness is unknown and is unlikely to reduce the project's HBW VMT by 27 percent (i.e., the amount needed to reduce the project's HBW VMT per employee of 16.2 to the 11.8 threshold, to reach a less-than-significant level). Therefore, this impact would be significant and unavoidable with mitigation.

5.2 Alternatives Considered but Rejected

Section 15126.6(c) of the CEQA Guidelines provides that an EIR should "identify any alternatives that were considered by the lead agency but rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency's determination." The screening process for identifying viable EIR alternatives included consideration of the following criteria.

- Ability to meet the project objectives
- Potential ability to substantially lessen or avoid environmental effects associated with the proposed project
- Potential feasibility

The discussion below describes alternatives that were considered during preparation and scoping of this draft EIR, and gives the rationale for eliminating these alternatives from detailed consideration.

5.2.1 Alternative with Podium Parking

An alternative that would include a taller building with podium parking was considered based on its potential to maximize the development potential at the project site as a result of its larger size. However, this alternative was rejected because it would not substantially reduce or eliminate the project's significant VMT impact (Impact TR-1) and GHG impacts (Impacts GHG-1 and GHG-2) because it would not reduce the average HBW VMT per employee.[1] The project's cumulatively considerable GHG impacts are only related to mobile source emissions and are a direct consequence of the significant VMT impact. Therefore, this alternative was rejected because it would not substantially reduce or eliminate the project's significant VMT or cumulatively considerable contribution to significant cumulative GHG impacts.

5.2.2 Reduced Height Alternative

An alternative similar to the proposed project but with a building reduced in height by one story and reduced in size by approximately 30,000 square feet was considered based on its potential to reduce the project's significant VMT impact (Impact TR-1) and GHG impacts (Impacts GHG-1 and GHG-2) as a result of its smaller size. However, a smaller project does not directly correlate to a reduced VMT impact because VMT is assessed based on a per-capita or per-employee rate. The project's cumulatively considerable contribution to significant cumulative GHG impacts are only related to mobile source emissions and are a direct consequence of the significant VMT impact. Therefore, this alternative was rejected because it would not substantially reduce or eliminate the project's significant VMT or cumulatively considerable contribution to significant cumulative GHG impacts. In addition, this alternative would not fully meet the project objectives to redevelop underutilized parcels within the project site at a higher density to build on the synergy of R&D development and to take advantage of opportunities offered in the East of 101 Area to create a vibrant, attractive and efficiently-designed R&D campus; provide sufficient space for tenants to employ key scientific and business personnel in proximity to each other to foster efficient collaboration and productivity; and maximize positive fiscal impacts for the City through the creation of jobs, enhancement of property values, and generation of property taxes and development fees.

5.2.3 Residential Land Use Alternative

An alternative that would develop all residential uses at the project site was considered based on its potential to reduce the project's significant VMT impact (Impact TR-1) and GHG impacts (Impacts GHG-1 and GHG-2). A residential alternative would have the potential to reduce the average HBW VMT per employee[2] by locating residential uses in an area predominantly occupied by employment uses, providing more opportunities for employees in the East of 101 area to live closer to their place of work. The project site is identified as Business Commercial (BC) in the General Plan and is zoned Gateway Specific Plan District under the City's zoning ordinance. Neither of these designations permit residential uses, nor would residential uses be consistent with existing land uses in the vicinity of the project site. Residential development at this site is not consistent with current General Plan direction and policies to preserve land East of 101 for employment uses. As part of the City's *Shape SSF 2040 General Plan* process, the City is considering residential uses in the East of 101 area, including high-density mixed use residential uses in areas adjacent to and within 0.5 mile to the Caltrain station in one of the alternatives. The areas along Gateway Boulevard that are under consideration for residential uses are within 0.5 mile of the Caltrain station, and do not include the

---

[1] The key metric used to determine a VMT impact is home-based work HBW VMT per capita, which is expressed as a rate per employee. For example, if an alternative would have fewer employees compared to the proposed project, it would still be required to substantially reduce the average trip length between employees' home and work to substantially reduce the average HBW VMT per employee compared to the proposed project.

[2] Ibid.

project site.[3] The City does not anticipate that the *Shape SSF 2040 General Plan* will consider residential uses for the project site. Furthermore, a residential alternative would be inconsistent with virtually all of the project objectives. Therefore, this alternative was rejected based on its infeasibility and inability to meet the basic project objectives.

5.2.4 Mixed-Use (Residential, Office, and R&D) Alternative

An alternative that would include a mix of housing, office, and R&D space on the project site was considered based on its potential to reduce the project's significant VMT impact (Impact TR-1) and GHG impacts (Impacts GHG-1 and GHG-2). A mixed-use alternative with a residential component would have the potential to reduce the average HBW VMT per employee[4] by locating residential uses in an area predominantly occupied by office uses, providing more opportunities for employees in the East of 101 area to live closer to their place of work. Because of FAR constraints, a Mixed-Use (Residential, Office, and R&D) Alternative would require a substantial reduction of the office/R&D uses in the project, in order to accommodate residential uses on site. A Mixed-Use (Residential, Office, and R&D) Alternative therefore would not fully meet the project objectives for many of the same reasons as the Reduced Height Alternative. However, introducing residential uses on the project site is not feasible for the same reasons discussed above for the Residential Land Use Alternative. Therefore, this alternative was rejected.

5.2.5 Mixed Use (Retail, Office, and R&D) Alternative

An alternative that would include a mix of retail (e.g., pharmacy chain such as CVS or Walgreens), office, and R&D space on the project site was considered based on its potential to reduce the project's significant VMT impact (Impact TR-1) and GHG impacts (Impacts GHG-1 and GHG-2). A mixed-use alternative with a retail component would have the potential to reduce VMT by locating retail uses in an area predominantly occupied by office uses, providing more opportunities for employees in the East of 101 area to shop closer to their place of work. This alternative could also attract new trips associated with the retail use from the surrounding area. A Mixed-Use (Retail, Office, and R&D) Alternative would be generally consistent with most of the project objectives. In addition, this alternative would comply with the project site's current General Plan designation as BC, which permits "administrative, financial, business, professional, medical and public offices, research and development facilities, and visitor-oriented and regional commercial activities", and retail sales is a permitted use in the GSPD IV zoning district. However, a project with increased retail does not directly correlate to a reduced VMT impact because VMT is assessed based on a per-capita or per-employee rate. Therefore, this alternative was rejected because it would not substantially reduce or eliminate the project's significant VMT impact (Impact TR-1) and GHG impacts (Impacts GHG-1 and GHG-2) for the proposed office and R&D uses.

---

[3] City of South San Francisco. 2020. *Shape SSF 2040 General Plan*. Available: https://shapessf.com/alternatives/. Accessed: July 24, 2020.

[4] The key metric used to determine a VMT impact is home-based work HBW VMT per capita, which is expressed as a rate per employee. For example, if an alternative would have fewer employees compared to the proposed project, it would still be required to substantially reduce the average trip length between employees' home and work to substantially reduce the average HBW VMT per employee compared to the proposed project.

5.2.6 Alternative Project Location

An alternative that would construct the proposed project at a different location in other areas of the City or in locations in the East of 101 area or within 0.5 mile to transit was considered based on its potential to reduce the project's significant VMT impact (Impact TR-1) and GHG impacts (Impacts GHG-1 and GHG-2).

Two potential alternative project locations were considered in the East of 101 area. One location is bounded by Sylvester Road to the west, Associated Road to the south, U.S. 101 to the east, and East Grand Avenue to the north. The site is currently occupied by a mix of light industrial and retail uses including an electric vehicle charging station, a bakery, a restaurant, a consignment shop, equipment rentals, and sheet metal fabrication. A second location is bounded by East Grand Avenue to the north, west, and south and Poletti Way to the east. The site is currently occupied by a Comfort Inn and Suites. As part of the City's *Shape SSF 2040 General Plan* process, the City is considering mixed-use development with residential uses at these sites in several of the land use alternatives. An alternative that would construct the proposed project closer to transit was considered based on its potential to reduce the project's significant VMT impact (Impact TR-1) and GHG impacts (Impacts GHG-1 and GHG-2). The Caltrain Station at East Grand Avenue is approximately 0.25 to 0.5 mile north of the two alternative project locations. CEQA Guidelines Section 15064.3, subdivision (b) (1), states that "generally, projects within ½ mile of an existing major transit stop[5] or a stop along an existing high quality transit corridor[6] should be presumed to cause less-than-significant transportation impact." OPR (2018) advises that the less than significant presumption would not apply, however, if project-specific or location-specific information indicates the project will still generate significant levels of VMT. As shown in in Section 4.9, *Transportation and Circulation*, HBW VMT per employee in the East of 101 area is higher than that of the Bay Area Region (16.2 compared to 14.2). Given the high levels of VMT generated by sites in the East of 101 area, sites within 0.5 mile of an existing major transit stop in the East of 101 area may still generate significant levels of VMT. Furthermore, this alternative was rejected because neither of the potential alternative sites are owned by the project sponsor. In addition, both sites have long-term leases and tenants and neither site may be available for purchase or development. These sites therefore would not be consistent with the project objectives.

It is anticipated that an alternative that would construct the proposed project in another area of the city (possibly outside of the East of 101 area) would not reduce the project's significant VMT impact (Impact TR-1) and GHG impacts (Impacts GHG-1 and GHG-2) because there are no low VMT office areas anywhere in the City outside of areas in close proximity to major transit stations.[7] In addition, this alternative would not reduce the project's significant VMT impact and GHG impacts because any new jobs added to the City of South San Francisco (particularly in the East of 101 area and in the biotech industry) would likely attract employees from throughout the Bay Area, which would generate substantially more VMT and worsen the regional balance between jobs and housing. Therefore, this alternative was rejected because of its potential infeasibility.

---

[5] A "major transit stop" means a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods.

[6] A "high-quality transit corridor" means a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours.

[7] City of South San Francisco. 2020. City of South San Francisco Significance Thresholds for Transportation. Available: https://ci-ssf-ca.legistar.com/LegislationDetail.aspx?ID=4563798&GUID=D74B6441-5B43-4DE4-A0C3-1EFBBEC7ECB2&FullText=1. Accessed: July 29, 2020.

5.3 Alternatives Selected for Further Review

As discussed in Section 5.2, the lead agency considered six alternatives that would have the potential to reduce the project's significant and unavoidable VMT impact (Impact TR-1) and GHG impacts (Impacts GHG-1 and GHG-2), and each alternative was rejected based on its inability to reduce or avoid the significant impacts of the project, its infeasibility, and/or its inability to meet the basic project objectives. Therefore, the lead agency also considered alternatives that would substantially reduce or avoid the impacts of the project that would require mitigation to be reduced to a less-than-significant level. These impacts include:

- **Impact AQ-2 (construction)**: The proposed project would not result in a cumulatively considerable net increase in any criteria pollutant for which the project region is classified as nonattainment under an applicable federal or state ambient air quality standard after mitigation.
- **Impact AQ-3 (construction)**: The proposed project would not expose sensitive receptors to substantial pollutant concentrations after mitigation.
- **Impact C-AQ-2 (construction)**: The proposed project would not result in a cumulatively considerable contribution to significant cumulative impacts related to a net increase in criteria pollutants for which the region is in nonattainment for an applicable federal or state ambient air quality standard after mitigation.
- **Impact C-AQ-3**: The proposed project in combination with past, present, and reasonably foreseeable future projects would not contribute to cumulative health risks for sensitive receptors after mitigation.
- **Impact BIO-1**: The proposed project would not 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 after mitigation.
- **Impact BIO-4:** The proposed project 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 after mitigation.
- **Impact C-BIO-1:** The proposed project would not result in a cumulatively considerable contribution to significant cumulative impacts on biological resources after mitigation.
- **Impact CR-2:** The proposed project would not cause a substantial adverse change in the significance of an archaeological resource, pursuant to Section 15064.5 after mitigation.
- **Impact CR-3:** The proposed project would not disturb any human remains, including those interred outside of formal cemeteries after mitigation.
- **Impact CR-4:** The proposed project would not cause a substantial adverse change in the significance of a tribal cultural resource, as defined in Public Resource Code Section 21074 after mitigation.
- **Impact C-CR-1:** The proposed project would not result in a cumulatively considerable contribution to significant cumulative impacts on archeological resources, human remains, and tribal cultural resources after mitigation.

- **Impact EN-1 (construction):** The proposed project would not result in a potentially significant environmental impact due to the wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation after mitigation.
- **Impact GEO-6:** The proposed project could directly or indirectly destroy a unique paleontological resource on site or unique geologic feature after mitigation.
- **Impact C-GEO-2:** The proposed project would not result in a cumulatively considerable contribution to significant cumulative impacts on paleontological resources after mitigation.
- **Impact GHG-1a (construction)**: The proposed project would not generate GHG emissions, either directly or indirectly, that may have significant impact on the environment during construction after mitigation.
- **Impact NOI-1 (construction)**: The proposed project would not generate 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 after mitigation.
- **Impact C-NOI-1 (construction):** The proposed project would not result in a cumulatively considerable contribution to the generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project site in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies after mitigation.
- **Impact TR-4:** The proposed project would not produce a detrimental impact to local transit or shuttle services, or conflict with adopted plans and programs after mitigation.

The project impacts requiring mitigation to reduce impacts to less-than-significant levels are largely related to construction impacts including ground disturbance, tree removal, and equipment emissions. Therefore, the alternatives selected for evaluation focus on reducing ground disturbance associated with the project, which would in turn reduce tree removals and emissions.

The three alternatives are evaluated in this chapter as listed below.

- Alternative A—No Project Alternative
- Alternative B—Reduced Surface Parking Lot Demolition Alternative
- Alternative C—Reduced Building Footprint Alternative

Under Alternative A—No Project Alternative, existing land uses and site conditions at the project site would not change and the existing floor area ratio (FAR) would remain at 0.55. Under Alternative B—Reduced Surface Parking Lot Demolition Alternative, a smaller part of the existing surface parking lot at the project site would be demolished, resulting in the same building as the proposed project but with a reduced area for parking, streetscape, and landscape improvements compared to the proposed project. Alternative C—Reduced Building Footprint Alternative would involve constructing a building with office, research and development (R&D), and retail (i.e., café and fitness center) space of the same height as the project, but with a reduced building footprint, approximately 25 percent less square footage, and the same ratio of uses as the proposed project.

Table 5-1 compares the main features of the proposed project to those of the alternatives.

Table 5-1. Comparison of Main Features of the Proposed Project to the Alternatives

Feature	Proposed Project	Alternative A—No Project Alternative	Alternative B—Reduced Surface Parking Lot Demolition Alternative	Alternative C—Reduced Building Footprint Alternative
Total proposed new uses at 751 Gateway Boulevard	208,800 square feet	None	208,800 square feet	156,600 square feet
Building Height	148 feet	None (existing 97-foot high building to remain)	148 feet	148 feet
Vehicle Parking	418 spaces	None (existing 558 spaces to remain)	Approximately 443 spaces	418 spaces
Existing Trees to be Removed	175 trees	None	143 trees	175 trees
Employees	1,181 employees (731 net new employees and 450 existing)	450 (No net new employees and 450 existing)	1,181 employees (731 net new employees and 450 existing)	998 employees (548 net new employees[a] and 450 existing)

Source: 701 Gateway Center LLC, 2020; ICF, 2020.

Notes: ~ = approximately; ADA = Americans with Disabilities Act; BC = business commercial; GSPD = Gateway Specific Plan District; R&D = research and development; sf = square feet (foot)

[a] This employee number is 25 percent reduced compared to the project because employee calculations are based on sf.

5.4 Alternative A—No Project Alternative

CEQA Guidelines Section 15126.6(e) requires evaluation of a “no project” alternative, stating “The purpose of describing and analyzing a no project alternative is to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project.” CEQA Guidelines Section 15126.6(e)(2) requires that the no project alternative analysis “discuss the existing conditions... as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and policies and consistent with the available infrastructure and community services.” As noted in CEQA Guidelines Section 15126.6, an EIR for “a development project on identifiable property” typically analyzes a no project alternative, i.e., “the circumstance under which the project does not proceed. Such a discussion would compare the environmental effects of the property remaining in its existing state against environmental effects that would occur if the project is approved. If disapproval of the project under consideration would result in predictable actions by others, such as the proposal of some other project, this ‘no project’ consequence should be discussed.”

5.4.1 Description

Under Alternative A—No Project Alternative, the existing land uses and site conditions at the project site would not change. The existing six-story, approximately 170,235-square-foot office building on the project site would remain, as would the existing surface parking, which has approximately 558 parking spaces. There would be no tree removal. Under the Alternative A, the FAR at the project site would remain at 0.53. Alternative A would not preclude potential future development of the project site with a range of land uses that are permitted at the project site.

5.4.2 Ability to Meet Project Objectives

Under Alternative A—No Project Alternative, the physical environment of the project site would remain generally unchanged. Therefore, Alternative A would fail to meet all of the basic project objectives (refer to Section 3.1.1 in Chapter 3, *Project Description*, of this draft EIR for a list of the project objectives that have been identified by the project sponsor and Table 5-3 for a comparison of the ability of this alternative to meet the objectives of the proposed project).

5.4.3 Impacts

The impact analysis below focuses on those impacts that were determined to be significant and unavoidable and less than significant with mitigation under the proposed project. Less-than-significant impacts are generally discussed at the end of the impact analysis.

This environmental analysis assumes that the existing structure, surface parking lot, and existing uses on the project site would not change and that the existing physical conditions, as described in detail for each environmental topic in Chapter 4, *Environmental Setting, Impacts, and Mitigation*, would remain the same. If Alternative A were implemented, none of the impacts associated with the proposed project as described in Chapter 4 would occur. However, development and growth would continue within the vicinity of the project site as reasonably foreseeable future projects are approved, constructed, and occupied. These projects could contribute to cumulative impacts in the vicinity, but under Alternative A, land use activity on the project site would not contribute to these cumulative impacts beyond existing levels.

5.4.3.1 Air Quality

Under Alternative A, there would be no demolition or construction activities and no new operational sources of air pollutants on the project site. The project site would remain in its current condition. Existing stationary sources of air pollution on and near the project site and major roadways contributing to air pollution in the project vicinity would remain. Alternative A would have no impact related to air quality compared to the proposed project, which would result in less-than-significant with mitigation project-level air quality impacts and a less than cumulatively considerable contribution to significant cumulative air quality impacts. Potential construction-related air quality impacts that would occur under the proposed project would not occur under Alternative A; thus, implementation of Mitigation Measures AQ-1, Use Clean Diesel-Powered Equipment during Construction to Control Construction-Related NO_X Emissions, and AQ-2, Implement BAAQMD Basic Construction Mitigation Measures, would not be required for this alternative.

5.4.3.2 Biological Resources

Under Alternative A, there would be no demolition activities, construction activities, or removal of trees or vegetation at the project site. The project site would remain in its current condition. Alternative A would have no impact related to biological resources compared to the proposed project, which would result in less-than-significant with mitigation project-level biological resources impacts and a less than cumulatively considerable contribution to significant cumulative biological resources impacts. Potential biological resources impacts that would occur under the proposed project would not occur under Alternative A; thus, implementation of Mitigation Measures BI-1, Preconstruction Nesting Bird Surveys and Buffer Areas; BI-2, Preconstruction Bat Survey for Roosting Bats and Roosting Habitat Abatement; BI-3, Lighting Measures to Reduce Impacts on Birds; and BI-4, Building Design Measures to Minimize Bird Strike Risk, would not be required for this alternative.

5.4.3.3 Cultural Resources and Tribal Cultural Resources

Under Alternative A, there would be no excavation, grading, or demolition activities at the project site. The project site would remain in its current condition. Alternative A would have no impact related to cultural resources and tribal cultural resources compared to the proposed project, which would result in less-than-significant with mitigation project-level cultural resources and tribal cultural resources impacts and a less than cumulatively considerable contribution to significant cumulative cultural resources and tribal cultural resources impacts. Potential cultural resources and tribal cultural resources impacts that would occur under the proposed project would not occur under Alternative A; thus, implementation of Mitigation Measures CR-1, Cultural Resources Worker Environmental Awareness Program (WEAP); CR-2, Halt Construction Activity, Evaluate Find, and Implement Mitigation for Archaeological, Historical, and Tribal Resources; and CR-3, Halt Construction Activity, Evaluate Remains, and Take Appropriate Action in Coordination with Native American Heritage Commission, would not be required for this alternative.

5.4.3.4 Energy

Under Alternative A, there would be no demolition or construction activities and no new operational demand for energy. The project site would remain in its current condition. Existing demand for energy at the project site would remain. Alternative A would have no impact related to energy compared to the proposed project, which would result in less-than-significant with mitigation project-level energy impacts and less than significant cumulative energy impacts. Potential energy impacts that would occur under the proposed project would not occur under Alternative A; thus, implementation of Mitigation Measure GHG-1, Require Implementation of BAAQMD-recommended Construction BMPs, and Mitigation Measure TR-1, First- and Last-mile Strategies, would not be required for this alternative.

5.4.3.5 Geology and Soils

Under Alternative A, there would be no excavation, grading, or demolition activities at the project site. The project site would remain in its current condition. Alternative A would have no impact related to geology and soils compared to the proposed project, which would result in less-than-significant with mitigation project-level geology and soils impacts and a less than cumulatively considerable contribution to significant cumulative geology and soils impacts. Potential paleontology impacts that would occur under the proposed project would not occur under

Alternative A; thus, implementation of Mitigation Measure GEO-1, Halt Construction Activity, Evaluate Find, and Implement Mitigation for Paleontological Resources, would not be required for this alternative.

5.4.3.6 Greenhouse Gas Emissions

Under Alternative A, there would be no demolition or construction activities and no new operational sources of greenhouse gas (GHG) emissions on the project site. The project site would remain in its current condition. Existing sources of GHG emissions on and near the project site would remain. Alternative A would have no impact related to operational GHG emissions compared to the proposed project, which would result in significant and unavoidable cumulatively considerable contribution to significant cumulative VMT-related GHG impacts during operation. In addition, Alternative A would have no impact compared to the less-than-significant GHG impacts during construction. Potential GHG impacts that would occur under the proposed project would not occur under Alternative A; thus, implementation of Mitigation Measure GHG-1, Require Implementation of BAAQMD-recommended Construction BMPs, Mitigation Measure GHG-2, Operational GHG Reduction Measures, and Mitigation Measure TR-1, First- and Last-mile Strategies, would not be required for this alternative.

5.4.3.7 Noise and Vibration

Under Alternative A, there would be no demolition or construction activities and no new operational sources of noise or vibration on the project site. The project site would remain in its current condition. Existing sources of noise and vibration on and near the project site and major roadways contributing to noise in the project vicinity would remain. Alternative A would have no impact related to noise and vibration compared to the proposed project, which would result in less-than-significant with mitigation project-level noise and vibration impacts and a less than cumulatively considerable contribution to significant cumulative noise and vibration impacts. Potential noise impacts that would occur under the proposed project would not occur under Alternative A; thus, implementation of Mitigation Measures NOI-1, Construction Noise Control Plan to Reduce Noise Outside of the Standard Construction Hours in the City of South San Francisco, and NOI-2, Operational Noise Study to Determine Attenuation Measures to Reduce Noise from Project Mechanical Equipment, would not be required for this alternative.

5.4.3.8 Transportation and Circulation

Under Alternative A, there would be no changes to transportation and circulation on or near the project site. The project site would remain in its current condition. Existing traffic conditions would remain. Alternative A would have no impact related to transportation and circulation compared to the proposed project, which would result in significant and unavoidable with mitigation project-level VMT-related transportation impacts and a cumulatively considerable contribution to significant and unavoidable cumulative VMT-related transportation impacts. In addition, Alternative A would have no impact compared to the other less-than-significant impacts of the project related to queuing, bicycle and pedestrian facilities, transit, hazards, and emergency access. Potential transportation and circulation impacts that would occur under the proposed project would not occur under Alternative A; thus, implementation of Mitigation Measure TR-1, First- and Last-mile Strategies, would not be required for this alternative.

5.4.3.9 Less-than-Significant Impacts

This draft EIR concludes that the proposed project would have no impact or less-than-significant impacts in all topics of the following analysis areas.

- Aesthetics
- Agricultural and Forest Resources
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use
- Mineral Resources
- Population and Housing
- Public Services
- Recreation
- Utilities
- Wildfire

Alternative A would result in no impact related to any of the above-listed environmental topics because this alternative would result in no changes to existing site conditions.

5.5 Alternative B—Reduced Surface Parking Lot Demolition Alternative

5.5.1 Description

Alternative B—Reduced Surface Parking Lot Demolition Alternative would demolish a smaller part of an existing surface parking lot at the project site, resulting in the same building as the proposed project but with a reduced area for parking, streetscape, and landscape improvements compared to the proposed project in the northern portion of the project site. Alternative B would redevelop approximately half of the existing surface parking lot in the northern portion of the project site with new parking, landscaping, trees, pedestrian entryway elements, and streetscape features compared to the proposed project, which would redevelop the entire surface parking lot. The other half of the existing surface parking lot would remain under Alternative B with the exception of possible asphalt resurfacing and new striping for the parking spaces. It is anticipated that the portion of the existing surface parking lot that would remain includes approximately 46 parking spaces compared to the 21 parking spaces that would be constructed in this area under the proposed project (refer to Figure 3-4 in Chapter 3, *Project Description*, of this draft EIR). The 376 existing parking spaces in the rectangular parking lots in the southern portion of the project site would be included in this alternative, as with the project. Thus, this alternative would result in approximately 25 more parking spaces than the proposed project, for a total of approximately 443 parking spaces compared to the 418 parking spaces proposed under the project, as shown in Table 5-1.

Alternative B would retain approximately 32 existing trees in the northeastern part of the project site that are proposed for removal under the project, bringing the total number of trees to be removed to 143 compared to 175 under the proposed project. It is anticipated that the amount of pervious surface under this alternative would be slightly less than under the proposed project because the existing surface parking lot includes more impervious surface area than the improvements proposed for the area under the project. Overall, Alternative B would involve a slightly reduced development area compared to the project. Site access and circulation would be similar to the proposed project.

The building design under Alternative B would be the same in height, square footage, bulk, architecture, and materials as the proposed project and would similarly be designed to meet LEED Gold certification and International WELL Building Institute WELL and FITWELL standards. Alternative B would include the same design features that support VMT reduction as the proposed project, including the TDM plan, the new employee shuttle stop along the western portion of the project site, and the installation of electric charging stations and bicycle parking within the project site. Alternative B would implement the same sustainability features, such as Energy Star-rated appliances, green infrastructure (e.g., biotreatment areas and other low-impact development), low-flow shower heads, aerators, and toilets, and waste diversion programs.

Alternative B, like the proposed project, would maintain the existing zoning designation of Zone IV under the Gateway Specific Plan District (GSPD) and the same existing zoning would apply to this alternative, which allows for development at a FAR of 1.25, or a maximum of 402,930 square feet, within the project site.

Infrastructure improvements associated with Alternative B would be similar to those described for the proposed project. The project site is serviced by existing potable water, stormwater, sanitary sewer, natural gas, electric, and trash and recycling services. New on-site facilities would be connected to new services through the installation of new, localized connections. Expansion or an increase in capacity of off-site infrastructure would occur as required by the utility providers. As with the project, Alternative B could include off-site infrastructure improvements outside of the project site but within the Gateway Campus.

The construction activities for Alternative B would be similar to the proposed project. The construction schedule for Alternative B may be slightly shorter than the proposed project. In addition, Alternative B would require substantially less ground disturbance in the northern portion of the project site and slightly less ground disturbance overall compared to the proposed project. Overall, Alternative B would result in a slightly reduced construction program in terms of timeline and activity.

As for the anticipated approvals, Alternative B would still require a TDM Plan approval, design review, and precise plan approval. Alternative B would also require standard City engineering, building, fire, and protected tree removal permits, along with other agency approvals (e.g., Bay Area Regional Water Quality Control Board, BAAQMD, and Federal Aviation Administration).

5.5.2 Ability to Meet Project Objectives

Alternative B—Reduced Surface Parking Lot Demolition Alternative would only partially meet the project objective to "develop a building that is aesthetically compatible with the surrounding vicinity, with height, massing and design treatment" because it would not maximize the visual potential and compatibility with surrounding uses regarding the proposed landscape, hardscape, and site plan. Alternative B would not redevelop a portion of the existing surface parking not in the northeastern portion of the project site. In addition, existing shrubs and other landscaping in the northeastern part of the project site would remain and would not be renovated. Similarly, Alternative B would also only partially meet the project objective to redevelop underutilized parcels within the project site at a higher density to build on the synergy of R&D development and to take advantage of opportunities offered in the East of 101 Area" because it would not maximize the opportunity to create a vibrant, attractive site. Alternative B would only partially meet the project objective to "develop an R&D campus with a high level of design quality" because it would not maximize the potential for high-quality landscape design treatments around the Gateway Campus. Alternative B would only partially meet the project objective to "enhance the visual quality of development around the existing Gateway Campus by providing a high-quality, modern building and functional and attractive landscape areas" because it would not maximize the potential for high-quality landscape design treatments around the campus. Alternative B would only partially meet the project objective to "promote alternatives to automobile transportation to further the City's transportation objectives by emphasizing linkages, transportation demand management (TDM), pedestrian access, and ease of movement between buildings" and the project objective to "enhance vehicular, bicycle, and pedestrian circulation and access in the area" because it would not maximize pedestrian circulation and ease of movement. Alternative B would fully meet the other project objectives. Therefore, Alternative B would meet some but not all of the project objectives (refer to Section 3.1.1 in Chapter 3, *Project Description*, of this draft EIR for a list of the project objectives that have been identified by the project sponsor and Table 5-3 for a comparison of the ability of this alternative to meet the objectives of the proposed project).

5.5.3 Impacts

The impact analysis below focuses on those impacts that were determined to be significant and unavoidable and less than significant with mitigation under the proposed project. Less-than-significant impacts are generally discussed at the end of the impact analysis.

5.5.3.1 Air Quality

Under the slightly reduced construction program of Alternative B, slightly less demolition and construction activities would occur in the northern portion of the project site, which would reduce construction emissions. This would slightly reduce construction-related emissions impacts, but would not eliminate the impacts. Thus, Mitigation Measures AQ-1, Use Clean Diesel-Powered Equipment during Construction to Control Construction-Related NO_X Emissions, and AQ-2, Implement BAAQMD Basic Construction Mitigation Measures, would continue to apply to Alternative B. Impacts associated with construction criteria air pollutant emissions under this alternative would be less than significant with mitigation, although slightly reduced compared to the proposed project. In addition, with implementation of Mitigation Measure AQ-1 and AQ-2, Alternative B's contribution to a cumulative criteria pollutant emissions impact would be less than cumulatively considerable, although slightly reduced compared to the proposed project.

During operations, the area and building energy sources of emissions under Alternative B would be similar to the proposed project. In addition, Alternative B would generate a similar number of vehicle trips. As with the project, Alternative B would be designed to meet LEED Gold certification and International WELL Building Institute WELL and FITWELL standards. Consequently, Alternative B would generate a similar level of operational air quality emissions. Impacts associated with operational criteria air pollutant emissions under this alternative would be less than significant, similar to the proposed project. In addition, similar to the proposed project, the alternative's contribution to cumulative operational air quality impacts would be less than cumulatively considerable under Alternative B.

Similar to the proposed project, construction and operation of Alternative B would generate toxic air contaminants (TACs), including diesel particulate matter and particulate matter ($PM_{2.5}$), within the same proximity from the same sensitive receptors (Gateway Child Development Center Peninsula) that would be affected by the proposed project. Under the slightly limited construction program of Alternative B and with implementation of Mitigation Measure AQ-1 and AQ-2, health-risks from construction-related DPM and $PM_{2.5}$ concentrations during construction would be less than significant with mitigation, although slightly reduced compared to the proposed project. Alternative B would include the same generator and testing activity as the proposed project. As with the proposed project, all new stationary sources under Alternative B would be subject to the permit authority of BAAQMD. Thus, operational TAC impacts under Alternative B would be less than significant, similar to the proposed project. Operational $PM_{2.5}$ concentrations would also be less than significant, similar to the proposed project. In addition, the alternative's contribution to cumulative health risks and substantial PM2.5 concentrations would be less than cumulatively considerable under Alternative B, although slightly reduced compared to the proposed project.

5.5.3.2 Biological Resources

Alternative B would involve a slightly reduced development area, which would require slightly less demolition, ground disturbance, and tree and landscape removal compared to the project. Thus, construction impacts to biological resources would be reduced because more existing habitat for birds, bats, and other animals would be retained. Specifically, Alternative B would retain approximately 32 existing trees in the northeastern part of the project site that are proposed for removal under the project, bringing the total number of trees to be removed to 143 compared to 175 under the proposed project. This would slightly reduce impacts to wildlife species such as migratory birds and roosting bats, but would not eliminate the impacts. Thus, Mitigation Measures BI-1, Preconstruction Nesting Bird Surveys and Buffer Areas; BI-2, Preconstruction Bat Survey for Roosting Bats and Roosting Habitat Abatement; BI-3, Lighting Measures to Reduce Impacts on Birds; and BI-4, Building Design Measures to Minimize Bird Strike Risk, would continue to apply to Alternative B. Alternative B, like the project, would be required to abide by all conditions specified in the City's Municipal Code, which requires that the project sponsor obtain permits to remove protected trees and to compensate for their removal by planting replacement trees of certain sizes and species as specified in the Municipal Code and by the Parks and Recreation director. With implementation of Mitigation Measures BI-1, BI-2, BI-3, and BI-4, project-level and cumulative biological resources impacts under Alternative B would be less than significant/less than cumulatively considerable with mitigation and slightly reduced compared to the proposed project.

5.5.3.3 Cultural Resources and Tribal Cultural Resources

Alternative B would involve a slightly reduced development area, which would require slightly less ground disturbance compared to the project. This would slightly reduce the potential for ground-disturbing activities to unearth previously unknown archaeological resources, but would not eliminate the impacts. Thus, Mitigation Measures CR-1, Cultural Resources Worker Environmental Awareness Program (WEAP); CR-2, Halt Construction Activity, Evaluate Find, and Implement

Mitigation for Archaeological, Historical, and Tribal Resources; and CR-3, Halt Construction Activity, Evaluate Remains, and Take Appropriate Action in Coordination with Native American Heritage Commission, would continue to apply to Alternative B. With implementation of Mitigation Measures CR-1, CR-2, and CR-3, project-level and cumulative cultural resources and tribal cultural resources impacts under Alternative B would be less than significant/less than cumulatively considerable with mitigation and slightly reduced compared to the proposed project.

5.5.3.4 Energy

Under the slightly reduced construction program of Alternative B, less demolition and construction activities would occur in the northern portion of the project site. This would slightly reduce the construction-related energy usage and consumption, but would not eliminate the impacts. Mitigation Measure GHG-1, Require Implementation of BAAQMD-recommended Construction BMPs, would continue to apply to Alternative B. Operation of Alternative B would result in a similar operation-related energy usage and consumption compared to the proposed project. As with the project, Alternative B would be designed to meet LEED Gold certification and International WELL Building Institute WELL and FITWELL standards. With implementation of Mitigation Measures GHG-1, project-level and cumulative energy impacts under Alternative B would be less than significant /less than cumulatively considerable with mitigation and slightly reduced compared to the proposed project.

5.5.3.5 Geology and Soils

Alternative B would involve a slightly reduced development area, which would require slightly less ground disturbance compared to the project. This would slightly reduce the potential for ground-disturbing activities to disturb geologic units with high paleontological sensitivity, but would not eliminate the impacts. Thus, Mitigation Measure GEO-1, Conduct Construction Personnel Training and Stop Work and Prepare and Implement a Recovery Plan If Paleontological Resources Are Discovered, would continue to apply to Alternative B. With implementation of Mitigation Measure GEO-1, project-level and cumulative geology and soils impacts under Alternative B would be less than significant/less than cumulatively considerable with mitigation and slightly reduced compared to the proposed project.

5.5.3.6 Greenhouse Gas Emissions

Under the slightly reduced construction program of Alternative B, less demolition and construction activities would occur in the northern portion of the project site. This would slightly reduce the construction-related GHG emissions, but would not eliminate the impacts. Mitigation Measure GHG-1, Require Implementation of BAAQMD-recommended Construction BMPs, would continue to apply to Alternative B. Alternative B would generate a similar number of vehicle trips compared to the proposed project. In addition, direct emissions generated by emergency generators, natural gas combustion, and landscaping activities and indirect emissions associated with electricity consumption, waste and wastewater generation, and water use would be similar to the proposed project. As with the project, Alternative B would be designed to meet LEED Gold certification and International WELL Building Institute WELL and FITWELL standards. Alternative B would implement the same sustainability features, such as Energy Star-rated appliances, green infrastructure (e.g., biotreatment areas and other low-impact development), low-flow shower heads, aerators, and toilets, and waste diversion programs. Operation of Alternative B would result in similar operation-related GHG emissions compared to the proposed project. Mitigation Measure

Mitigation Measure GHG-2, Operational GHG Reduction Measures, would continue to apply to Alternative B. With implementation of Mitigation Measures GHG-1 and GHG-2, project contribution to significant cumulative GHG emissions impacts under Alternative B would be cumulatively considerable, and cumulative impacts would be significant and unavoidable with mitigation, similar to the proposed project.

5.5.3.7 Noise and Vibration

Under the slightly reduced construction program of Alternative B, less demolition and construction activities would occur in the northern portion of the project site, which would reduce construction noise and vibration. This would slightly reduce construction-related noise and vibration impacts, but would not eliminate the impacts. Thus, Mitigation Measure NOI-1, Construction Noise Control Plan to Reduce Noise Outside of the Standard Construction Hours in the City of South San Francisco, would continue to apply to Alternative B. During operations, noise from the proposed heating, ventilation, and air conditioning (HVAC) systems and mechanical equipment and emergency generators under Alternative B would be similar to the proposed project. In addition, Alternative B would generate a similar number of vehicle trips and traffic noise would be similar to the proposed project. Thus, Mitigation Measure NOI-2, Operational Noise Study to Determine Attenuation Measures to Reduce Noise from Project Mechanical Equipment, would continue to apply to Alternative B. With implementation of Mitigation Measures NOI-1 and NOI-2, project-level and cumulative noise and vibration impacts under Alternative B would be less than significant/less than cumulatively considerable with mitigation and slightly reduced compared to the proposed project.

5.5.3.8 Transportation and Circulation

Under the slightly reduced construction program of Alternative B, less demolition and construction activities would occur in the northern portion of the project site, which would reduce construction trips. During operations, site access and circulation would be similar to the proposed project. Alternative B would generate a similar number of vehicle trips. Thus, Mitigation Measure TR-1, First- and Last-mile Strategies, would continue to apply to Alternative B. Mitigation Measure TR-1 requires approval and implementation of several off-site improvements and paying a fair-share contribution toward other off-site improvements. Alternative B would include the same design features that support VMT reduction as the proposed project, including the TDM plan measures, the new employee shuttle stop along the western portion of the project site, and the installation of electric charging stations and bicycle parking within the project site. Operation of Alternative B would result in similar operation-related transportation and circulation impacts compared to the proposed project. With implementation of Mitigation Measure TR-1, project-level and cumulative transportation and circulation impacts under Alternative B would be significant and unavoidable with mitigation, similar to the proposed project.

5.5.3.9 Less-than-Significant Impacts

This draft EIR concludes that the proposed project would have no impact or less-than-significant impacts in all topics of the following analysis areas.

- Aesthetics
- Agricultural and Forest Resources
- Hazards and Hazardous Materials

- Hydrology and Water Quality
- Land Use
- Mineral Resources
- Population and Housing
- Public Services
- Recreation
- Utilities
- Wildfire

Alternative B would occupy the same project site and construct the same building with a slightly reduced development plan and demolition requirement compared to the proposed project. As a result, the construction and operational impacts of Alternative B for each of the environmental topics noted above would be similar to, or would be reduced compared to those of the proposed project.

5.6 Alternative C—Reduced Building Footprint Alternative

5.6.1 Description

Alternative C—Reduced Building Footprint Alternative would construct a building that is the same height as the proposed project with the same ratio of office, R&D, and retail (i.e., café and fitness center) uses, but with a reduced building footprint and approximately 25 percent less square footage. Alternative C includes a total of 156,600 square feet compared to 208,800 square feet under the proposed project, as shown in Table 5-1. The site plan for this alternative would otherwise be similar to the proposed project. Site access and circulation would be similar to the proposed project. Alternative C would include the same overall pedestrian and landscape improvements to the site as the proposed project. Thus, it is anticipated that the amount of pervious surface under this alternative would be similar to the proposed project. Overall, Alternative B would involve a similarly sized development area compared to the project even though the building footprint would be reduced because it is anticipated that additional site improvements (e.g., landscaping and hardscaped areas) would be constructed around the perimeter of the building. In addition, Alternative C would require the removal of 175 existing trees, as with the proposed project.

The building design under Alternative C would be the same in height, architecture, and materials as the proposed project. However, the building under Alternative C would include less square footage and, thus, less bulk than the proposed project. The building under Alternative C would similarly be designed to meet LEED Gold certification and International WELL Building Institute WELL and FITWELL standards. Alternative C would include the same design features that support VMT reduction as the proposed project, including the TDM plan measures, the new employee shuttle stop along the western portion of the project site, and the installation of electric charging stations and bicycle parking within the project site. Alternative C would implement the same sustainability features, such as Energy Star-rated appliances, green infrastructure (e.g., biotreatment areas and other low-impact development), low-flow shower heads, aerators, and toilets, and waste diversion programs.

Alternative C, like the proposed project, would maintain the existing zoning designation of Zone IV under the GSPD and the same existing zoning would apply to this alternative, which allows for development at a FAR of 1.25, or a maximum of 402,930 square feet, within the project site.

Infrastructure improvements associated with Alternative C would be similar to those described for the proposed project. The project site is serviced by existing potable water, stormwater, sanitary sewer, natural gas, electric, and trash and recycling services. New on-site facilities would be connected to new services through the installation of new, localized connections. Expansion or an increase in capacity of off-site infrastructure would occur as required by the utility providers. As with the project, Alternative C could include off-site infrastructure improvements outside of the project site but within the Gateway Campus.

The construction activities for Alternative C would be similar to the proposed project. The construction schedule for Alternative C may be substantially shorter than the proposed project. In addition, Alternative C would require substantially less ground disturbance near the building footprint and slightly less ground disturbance overall compared to the proposed project. Overall, Alternative C would result in a substantially reduced construction program.

As for the anticipated approvals, Alternative C would still require a TDM Plan approval, design review, precise plan approval, and a CUP to Authorize a Parking Decrease. Alternative C would also require standard City engineering, building, fire, and protected tree removal permits, along with other agency approvals (e.g., Bay Area Regional Water Quality Control Board, BAAQMD, and Federal Aviation Administration).

5.6.2 Ability to Meet Project Objectives

Alternative C—Reduced Building Footprint Alternative would only partially meet the project objective to "create state-of-the-art R&D facilities consistent with the South San Francisco General Plan (General Plan) designation for the site as well as General Plan goals and policies" because it would not maximize allowable uses under the existing General Plan land use designation (BC). Alternative C would involve constructing a building that is the same height as the proposed project with the same ratio of office, R&D, and retail uses, but with a reduced building footprint and approximately 25 percent less square footage. Similarly, Alternative C would only partially meet the project objective to "promote the City's ongoing development of the "East of 101 Area" into a nationally recognized biotechnology and R&D center" because it would not maximize the site's potential uses to the same extent as the project. Alternative C would only partially meet the project objective to "further the City's policies for developing the East of 101 Area with new opportunities for continued evolution from manufacturing and warehousing/distribution to biotechnology and R&D" because it would not maximize biotechnology and R&D uses at the site compared to the proposed project. Alternative C would only partially meet the project objective to "redevelop underutilized parcels within the project site at a higher density" because it would not maximize the allowable land uses on the project site. Alternative C would only partially meet the project objective to "build a project that creates quality jobs for the City" because it would not maximize quality job creation to the extent possibly under the allowable land uses. Alternative C would generate fewer jobs than the proposed project. Alternative C would only partially meet the project objectives to "build a project that is viable in the East of 101 Area, based on market conditions and project service requirements for the area" and to "maximize positive fiscal impacts for the City through the creation of jobs, enhancement of property values, and generation of property taxes and development fees" because it would be less viable, generate a lower fewer jobs, enhance the property to a lesser extent, and generate fewer taxes and fees compared to the proposed project. Therefore, Alternative C would meet some but not all of the project objectives (refer to Section 3.1.1 in Chapter 3, *Project Description*, of this draft EIR for a list of the project objectives that have been identified by the project sponsor and Table 5-3 for a comparison of the ability of this alternative to meet the objectives of the proposed project).

5.6.3 Impacts

The impact analysis below focuses on those impacts that were determined to be significant and unavoidable and less than significant with mitigation under the proposed project. Less-than-significant impacts are generally discussed at the end of the impact analysis.

5.6.3.1 Air Quality

Under the substantially reduced construction program of Alternative C, less construction activities would be required for the reduced building footprint, which would reduce construction emissions. This would reduce construction-related emissions impacts, but would not eliminate the impacts. Thus, Mitigation Measures AQ-1, Use Clean Diesel-Powered Equipment during Construction to Control Construction-Related NO_X Emissions, and AQ-2, Implement BAAQMD Basic Construction Mitigation Measures, would continue to apply to Alternative C. Impacts associated with construction criteria air pollutant emissions under this alternative would be less than significant with mitigation, although slightly reduced compared to the proposed project. In addition, with implementation of Mitigation Measure AQ-1 and AQ-2, Alternative C's contribution to a cumulative criteria pollutant emissions impact would be less than cumulatively considerable, although slightly reduced compared to the proposed project.

During operations, the area and building energy sources of emissions under Alternative C would be less than the proposed project because the proposed building would be approximately 25 percent smaller. In addition, Alternative C would generate a fewer vehicle trips than the proposed project because there would be fewer employees at the project site. Consequently, Alternative C would generate fewer operational air quality emissions. As with the project, Alternative C would be designed to meet LEED Gold certification and International WELL Building Institute WELL and FITWELL standards. Impacts associated with operational criteria air pollutant emissions under this alternative would be less than significant, although slightly reduced compared to the proposed project. In addition, similar to the proposed project, the alternative's contribution to cumulative operational air quality impacts would be less than cumulatively considerable under Alternative C.

Similar to the proposed project, construction and operation of Alternative C would generate toxic air contaminants (TACs), including diesel particulate matter and particulate matter ($PM_{2.5}$), within the same proximity from the same sensitive receptors (Gateway Child Development Center Peninsula) that would be affected by the proposed project. Under the slightly limited construction program of Alternative C and with implementation of Mitigation Measure AQ-1 and AQ-2, health-risks from construction-related DPM and $PM_{2.5}$ concentrations during construction would be less than significant with mitigation, although slightly reduced compared to the proposed project. Alternative B would include the same generator and testing activity as the proposed project. As with the proposed project, all new stationary sources under Alternative C would be subject to the permit authority of BAAQMD. Thus, operational TAC impacts under Alternative C would be less than significant, similar to the proposed project. Operational $PM_{2.5}$ concentrations would also be less than significant, similar to the proposed project. In addition, the alternative's contribution to cumulative health risks and substantial PM2.5 concentrations would be less than cumulatively considerable under Alternative C, although slightly reduced compared to the proposed project.

5.6.3.2 Biological Resources

Alternative C would involve a similarly sized development area, which would require the removal of 175 existing trees, as with the proposed project. Impacts to wildlife species such as migratory birds and roosting bats under this alternative would be similar to the proposed project. Thus, Mitigation Measures BI-1, Preconstruction Nesting Bird Surveys and Buffer Areas; BI-2, Preconstruction Bat Survey for Roosting Bats and Roosting Habitat Abatement; BI-3, Lighting Measures to Reduce Impacts on Birds; and BI-4, Building Design Measures to Minimize Bird Strike Risk, would continue to apply to Alternative C. Alternative C, like the project, would be required to abide by all conditions specified in the City's Municipal Code, which requires that the project sponsor obtain permits to remove protected trees and to compensate for their removal by planting replacement trees of certain sizes and species as specified in the Municipal Code and by the Parks and Recreation director, and impacts. With implementation of Mitigation Measures BI-1, BI-2, BI-3, and BI-4, project-level and cumulative biological resources impacts under Alternative C would be less than significant with mitigation and slightly reduced compared to the proposed project.

5.6.3.3 Cultural Resources and Tribal Cultural Resources

Alternative C would involve a reduced building footprint, which would require substantially less ground disturbance near the building footprint and slightly less ground disturbance overall compared to the proposed project. This would reduce the potential for ground-disturbing activities could unearth previously unknown archaeological resources, but would not eliminate the impacts. Mitigation Measures CR-1, Cultural Resources Worker Environmental Awareness Program (WEAP); CR-2, Halt Construction Activity, Evaluate Find, and Implement Mitigation for Archaeological, Historical, and Tribal Resources; and CR-3, Halt Construction Activity, Evaluate Remains, and Take Appropriate Action in Coordination with Native American Heritage Commission, would continue to apply to Alternative C. With implementation of Mitigation Measures CR-1, CR-2, and CR-3, project-level cultural resources and tribal cultural resources impacts and under Alternative C would be less than significant with mitigation and the project's contribution to cumulative cultural resources and tribal cultural resources impacts and under Alternative C would be less than cumulatively considerable with mitigation and slightly reduced compared to the proposed project.

5.6.3.4 Energy

Under the substantially reduced construction program of Alternative C, less construction activities would be required for the reduced building footprint. This would slightly reduce the construction-related energy usage and consumption, but would not eliminate the impacts. Mitigation Measure GHG-1, Require Implementation of BAAQMD-recommended Construction BMPs, would continue to apply to Alternative C. During operations, the energy usage and consumption under Alternative C would be less than the proposed project because the proposed building would be approximately 25 percent smaller. As with the project, Alternative C would be designed to meet LEED Gold certification and International WELL Building Institute WELL and FITWELL standards. With implementation of Mitigation Measures GHG-1, project-level energy impacts under Alternative C would be less than significant with mitigation the project's contribution to cumulative energy impacts and under Alternative C would be less than cumulatively considerable with mitigation and slightly reduced compared to the proposed project.

5.6.3.5 Geology and Soils

Alternative C would involve a reduced building footprint, which would require substantially less ground disturbance near the building footprint and slightly less ground disturbance overall compared to the proposed project. This would reduce the potential for ground-disturbing activities to disturb geologic units with high paleontological sensitivity, but would not eliminate the impacts. Thus, Mitigation Measure GEO-1, Halt Construction Activity, Evaluate Find, and Implement Mitigation for Paleontological Resources, would continue to apply to Alternative C. With implementation of Mitigation Measure GEO-1, project-level geology and soils impacts under Alternative C would be less than significant with mitigation the project's contribution to cumulative geology and soils impacts and under Alternative C would be less than cumulatively considerable with mitigation and slightly reduced compared to the proposed project.

5.6.3.6 Greenhouse Gas Emissions

Under the substantially reduced construction program of Alternative C, less construction activities would be required for the reduced building footprint. This would slightly reduce the construction-related GHG emissions, but would not eliminate the impacts. Mitigation Measure GHG-1, Require Implementation of BAAQMD-recommended Construction BMPs, would continue to apply to Alternative C. Alternative C would generate fewer vehicle trips than the proposed project because there would be fewer employees at the project site. In addition, direct emissions generated by emergency generators, natural gas combustion, and landscaping activities and indirect emissions associated with electricity consumption, waste and wastewater generation, and water use would be reduced compared to the proposed project because the proposed building would be approximately 25 percent smaller. As with the project, Alternative C would be designed to meet LEED Gold certification and International WELL Building Institute WELL and FITWELL standards. Alternative C would implement the same sustainability features, such as Energy Star-rated appliances, green infrastructure (e.g., biotreatment areas and other low-impact development), low-flow shower heads, aerators, and toilets, and waste diversion programs. Operation of Alternative C would result in reduced operation-related GHG emissions compared to the proposed project. Mitigation Measure Mitigation Measure GHG-2, Operational GHG Reduction Measures, would continue to apply to Alternative B. With implementation of Mitigation Measures GHG-1 and GHG-2, cumulative GHG emissions impacts under Alternative C would be cumulatively considerable with mitigation, similar to the proposed project because it would not reduce the average HBW VMT per employee.[8]

5.6.3.7 Noise and Vibration

Under the substantially reduced construction program of Alternative C, less construction activities would be required for the reduced building footprint, which would reduce construction noise and vibration. This would slightly reduce construction-related noise and vibration impacts,

[8] The key metric used to determine a VMT impact is home-based work HBW VMT per capita, which is expressed as a rate per employee. For example, if an alternative would have fewer employees compared to the proposed project, it would still be required to substantially reduce the average trip length between employees' home and work to substantially reduce the average HBW VMT per employee compared to the proposed project.

but would not eliminate the impacts. Thus, Mitigation Measure NOI-1, Construction Noise Control Plan to Reduce Noise Outside of the Standard Construction Hours in the City of South San Francisco, would continue to apply to Alternative C. During operations, Alternative C would generate fewer vehicle trips than the proposed project because there would be fewer employees at the project site, which would reduce traffic noise. Noise from the proposed HVAC systems and mechanical equipment and emergency generators under Alternative C would be similar to the proposed project. Thus, Mitigation Measure NOI-2, Operational Noise Study to Determine Attenuation Measures to Reduce Noise from Project Mechanical Equipment, would continue to apply to Alternative C. With implementation of Mitigation Measures NOI-1 and NOI-2, project-level noise and vibration impacts under Alternative C would be less than significant and less than cumulatively considerable with mitigation and slightly reduced compared to the proposed project.

5.6.3.8 Transportation and Circulation

Under the substantially reduced construction program of Alternative C, less construction activities would be required for the reduced building footprint, which would reduce construction trips.

During operations, site access and circulation would be similar to the proposed project. The number of daily vehicle trips under Alternative C would be less than the proposed project because the proposed building would be approximately 25 percent smaller. Alternative C would generate approximately 1,400 net daily vehicle trips, with 160 in the morning peak hour and 130 in the evening peak hour (compared to 1,784 net daily vehicle trips, with 206 in the morning peak hour and 172 in the evening peak hour under the proposed project). This represents a decrease of approximately 38 net daily vehicle trips (or 25 percent) compared to the proposed project. Trip distribution percentages and choices of routes to and from the project site for Alternative C were assumed to be consistent with the assumptions used for analysis of the proposed project. These assumptions are based on the City/County Association of Governments of San Mateo County (C/CAG)'s Travel Demand Model and the City's Travel Demand Model, which have greater sensitivity to local travel patterns. Vehicle trips generated by Alternative C would result in some reduced transportation impacts as compared to the proposed project. While Alternative C would generate fewer employees and trips compared to the proposed project, it would not substantially reduce the average trip length between employees' home and work and would not substantially reduce the average HBW VMT per employee compared to the proposed project.[9] Thus, Mitigation Measure TR-1, First- and Last-mile Strategies, would continue to apply to Alternative C. Mitigation Measure TR-1 requires approval and implementation of several off-site improvements and paying a fair-share contribution toward other off-site improvements. Alternative C would include the same design features that support VMT reduction as the proposed project, including the TDM plan, the new employee shuttle stop along the western portion of the project site, and the installation of electric charging stations and bicycle parking within the project site. With implementation of Mitigation Measure TR-1, project-level and cumulative transportation and circulation impacts under Alternative C would be significant and unavoidable with mitigation, similar to the proposed project because it would not reduce the average HBW VMT per employee.

[9] Ibid.

5.6.3.9 Less-than-Significant Impacts

This draft EIR concludes that the proposed project would have no impact or less-than-significant impacts in all topics of the following analysis areas.

- Aesthetics
- Agricultural and Forest Resources
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use
- Mineral Resources
- Population and Housing
- Public Services
- Recreation
- Utilities
- Wildfire

Alternative C would occupy the same project site but with a smaller building footprint and reduced building square footage than the proposed project and would otherwise have a similar development program and site plan overall. As a result, the construction and operational impacts of Alternative C—Reduced Building Footprint Alternative, for each of the environmental topics noted above would be similar or reduced compared to those of the proposed project.

5.7 Environmentally Superior Alternative

CEQA Guidelines Section 15126.6(e)(2) requires identification of an environmentally superior alternative (i.e., the alternative that has the fewest significant environmental impacts) from among the other alternatives evaluated if the proposed project has significant impacts that cannot be mitigated to a less-than-significant level. If the No Project Alternative (i.e., Alternative A) is found to be the environmentally superior alternative, the EIR must identify an environmentally superior alternative among the other alternatives.

Table 5-2 compares the significant and less-than-significant with mitigation impacts of the proposed project to those of the alternatives. Table 5-3 compares the ability of the alternatives to meet the objectives of the proposed project.

Alternative B and Alternative C would result in the same significant and unavoidable impacts with mitigation related to transportation and circulation and GHG emissions because neither alternative would reduce the average HBW VMT per employee. Among the alternatives to the project, Alternative B would offer a lower level of impact by reducing the site-specific impacts that would be less than significant with mitigation. Specifically, Alternative B would require less ground disturbance and fewer tree removals, which would reduce impacts to biological resources, cultural resources and tribal resources, and geology and soils (paleontology) to a greater extent than Alternative C. Therefore, Alternative B is the environmentally superior alternative. Alternative B would also meet more of the project objectives compared to Alternative C, although it would not meet all of the project objectives and it would only partially meet some of the project objectives, as shown in Table 5-3.

[page left blank intentionally]

Table 5-2. Comparison of Proposed Project Significant Impacts and Less-than-Significant Impacts with Mitigation to Alternatives

Potential Environmental Impacts	Proposed Project	Alternative A—No Project	Alternative B—Reduced Surface Parking Lot Demolition Alternative	Alternative C—Reduced Building Footprint Alternative
Significant Impacts				
Impact TR-1: The project would generate per-employee VMT greater than the City threshold.	Significant and Unavoidable with Mitigation	No Impact	Significant and Unavoidable with Mitigation (similar to the project)	Significant and Unavoidable with Mitigation (similar to the project)
Impact GHG-1b: The project would generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment during operation.	Significant and Unavoidable with Mitigation	No Impact	Significant and Unavoidable with Mitigation (similar to the project)	Significant and Unavoidable with Mitigation (similar to the project)
Impact GHG-2: The project would conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.	Significant and Unavoidable with Mitigation	No Impact	Significant and Unavoidable with Mitigation (similar to the project)	Significant and Unavoidable with Mitigation (similar to the project)
Less-than-Significant Impacts with Mitigation				
Impact AQ-2 (construction): The proposed project would not result in a cumulatively considerable net increase in any criteria pollutant for which the project region is classified as nonattainment under an applicable federal or state ambient air quality standard.	Less than Significant with Mitigation	No Impact	Less than Significant with Mitigation (slightly reduced compared to the project)	Less than Significant with Mitigation (slightly reduced compared to the project)
Impact AQ-3 (construction): The proposed project would not expose sensitive receptors to substantial pollutant concentrations.	Less than Significant with Mitigation	No Impact	Less than Significant with Mitigation (slightly reduced compared to the project)	Less than Significant with Mitigation (slightly reduced compared to the project)
Impact C-AQ-2 (construction): The proposed project would not result in a cumulatively considerable contribution to significant cumulative impacts related to a net increase in criteria pollutants or which the region is in nonattainment for an applicable federal or state ambient air quality standard.	Less than Cumulatively Considerable Contributor with Mitigation	No Impact	Less than Cumulatively Considerable Contributor with Mitigation (slightly reduced compared to the project)	Less than Cumulatively Considerable Contributor with Mitigation (slightly reduced compared to the project)
Impact C-AQ-3: The proposed project in combination with past, present, and reasonably foreseeable future projects would not contribute to cumulative health risks for sensitive receptors.	Less than Significant with Mitigation	No Impact	Less than Significant with Mitigation (slightly reduced compared to the project)	Less than Significant with Mitigation (slightly reduced compared to the project)
Impact BIO-1: The proposed project would not 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.	Less than Significant with Mitigation	No Impact	Less than Significant with Mitigation (slightly reduced compared to the project)	Less than Significant with Mitigation (similar to the project)
Impact BIO-4: The proposed project 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.	Less than Significant with Mitigation	No Impact	Less than Significant with Mitigation (slightly reduced compared to the project)	Less than Significant with Mitigation (similar to the project)
Impact C-BIO-1: The proposed project would not result in a cumulatively considerable contribution to significant cumulative impacts on biological resources.	Less than Cumulatively Considerable Contributor with Mitigation	No Impact	Less than Cumulatively Considerable Contributor with Mitigation (slightly reduced compared to the project)	Less than Cumulatively Considerable Contributor with Mitigation (similar to the project)
Impact CR-2: The proposed project would not cause a substantial adverse change in the significance of an archaeological resource, pursuant to Section 15064.5.	Less than Significant with Mitigation	No Impact	Less than Significant with Mitigation (slightly reduced compared to the project)	Less than Significant with Mitigation (slightly reduced compared to the project)
Impact CR-3: The proposed project would not disturb any human remains, including those interred outside of formal cemeteries.	Less than Significant with Mitigation	No Impact	Less than Significant with Mitigation (slightly reduced compared to the project)	Less than Significant with Mitigation (slightly reduced compared to the project)

Potential Environmental Impacts	Proposed Project	Alternative A— No Project	Alternative B— Reduced Surface Parking Lot Demolition Alternative	Alternative C— Reduced Building Footprint Alternative
Impact CR-4: The proposed project would not cause a substantial adverse change in the significance of a tribal cultural resource, as defined in Public Resource Code Section 21074.	Less than Significant with Mitigation	No Impact	Less than Significant with Mitigation (slightly reduced compared to the project)	Less than Significant with Mitigation (slightly reduced compared to the project)
Impact C-CR-1: The proposed project would not result in a cumulatively considerable contribution to significant cumulative impacts on archeological resources, human remains, and tribal cultural resources.	Less than Cumulatively Considerable Contributor with Mitigation	No Impact	Less than Cumulatively Considerable Contributor with Mitigation (slightly reduced compared to the project)	Less than Cumulatively Considerable with Mitigation (slightly reduced compared to the project)
Impact EN-1 (construction): The proposed project would not result in a potentially significant environmental impact due to the wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation.	Less than Significant with Mitigation	No Impact	Less than Significant with Mitigation (slightly reduced compared to the project)	Less than Significant with Mitigation (slightly reduced compared to the project)
Impact GEO-6: The proposed project could directly or indirectly destroy a unique paleontological resource on site or unique geologic feature.	Less than Significant with Mitigation	No Impact	Less than Significant with Mitigation (slightly reduced compared to the project)	Less than Significant with Mitigation (slightly reduced compared to the project)
Impact C-GEO-2: The proposed project would not result in a cumulatively considerable contribution to significant cumulative impacts on paleontological resources.	Less than Cumulatively Considerable Contributor with Mitigation	No Impact	Less than Cumulatively Considerable Contributor with Mitigation (slightly reduced compared to the project)	Less than Cumulatively Considerable Contributor with Mitigation (slightly reduced compared to the project)
Impact GHG-1a (construction): The proposed project would not generate GHG emissions, either directly or indirectly, that may have significant impact on the environment during construction.	Less than Significant with Mitigation	No Impact	Less than Significant with Mitigation (slightly reduced compared to the project)	Less than Significant with Mitigation (slightly reduced compared to the project)
Impact NOI-1 (construction): The proposed project would not generate 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.	Less than Significant with Mitigation	No Impact	Less than Significant with Mitigation (slightly reduced compared to the project)	Less than Significant with Mitigation (slightly reduced compared to the project)
Impact C-NOI-1 (construction): The proposed project would not result in a cumulatively considerable contribution to the generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project site in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies.	Less than Cumulatively Considerable Contributor with Mitigation	No Impact	Less than Cumulatively Considerable Contributor with Mitigation (slightly reduced compared to the project)	Less than Significant with Mitigation (slightly reduced compared to the project)
Impact TR-4: The proposed project would not produce a detrimental impact to local transit or shuttle services, or conflict with adopted plans and programs.	Less than Significant with Mitigation	No Impact	Less than Significant with Mitigation (similar to the project)	Less than Significant with Mitigation (slightly reduced compared to the project)

Table 5-3. Ability of Alternatives to Meet Project Objectives

Project Objective	Alternative A—No Project	Alternative B—Reduced Surface Parking Lot Demolition Alternative	Alternative C—Reduced Building Footprint Alternative
Create state-of-the-art R&D facilities consistent with the South San Francisco General Plan (General Plan) designation for the site as well as General Plan goals and policies.	No	Yes	Partial: does not maximize allowable uses under the existing General Plan land use designation (BC)
Develop a building that is aesthetically compatible with the surrounding vicinity, with height, massing and design treatment that is compatible with other recent development in the East of 101 Area.	No	Partial: does not maximize visual potential and compatibility with surrounding uses regarding landscape, hardscape, and site plan	Yes
Promote the City's ongoing development of the "East of 101 Area" into a nationally recognized biotechnology and R&D center to attract other life science uses.	No	Yes	Partial: does not maximize this potential
Further the City's policies for developing the East of 101 Area with new opportunities for continued evolution from manufacturing and warehousing/distribution to biotechnology and R&D.	No	Yes	Partial: does not maximize this opportunity
Redevelop underutilized parcels within the project site at a higher density to build on the synergy of R&D development and to take advantage of opportunities offered in the East of 101 Area to create a vibrant, attractive, and efficiently-designed R&D campus.	No	Partial: does not maximize the opportunity to create a vibrant, attractive site	Partial: does not maximize allowable land uses
Develop an R&D campus with a high level of design quality, as called for in the design policies and guidelines of the *East of 101 Area Plan*.	No	Partial: does not maximize the potential for high-level of landscape and site design quality	Yes
Build a project that creates quality jobs for the City.	No	Yes	Partial: does not maximize quality job creation to the extent possible under allowable land uses
Provide sufficient space for tenants to employ key scientific and business personnel in proximity to each other to foster efficient collaboration and productivity.	No	Yes	Partial
Capitalize on the project's proximity to the new Caltrain station to provide transit-oriented employment opportunities, encourage employees to commute using public transit, and reduce VMT and air emissions by reducing single-occupancy vehicle trips.	No	Yes	Yes
Enhance the visual quality of development around the existing Gateway Campus by providing a high-quality, modern building and functional and attractive landscape areas. The project will take advantage of and enhance access to the Caltrain station by upgrading the pedestrian and bicycle connections within and to the Gateway Campus.	No	Partial: does not maximize the potential for high-quality landscape design treatments around the Gateway Campus	Yes
Promote alternatives to automobile transportation to further the City's transportation objectives by emphasizing linkages, transportation demand management (TDM), pedestrian access, and ease of movement between buildings.	No	Partial: does not maximize pedestrian circulation and ease of movement experience	Yes
Enhance vehicular, bicycle, and pedestrian circulation and access in the area surrounding the project site.	No	Partial: does not maximize user circulation and access potential	Yes
Build a project that is viable in the East of 101 area based on market conditions and project service requirements for the area.	No	Yes	Partial: less viable than the proposed project
Incorporate flexibility for office and R&D uses to ensure that the project is responsive to tenant demands, based on market conditions.	No	Yes	Yes
Maximize positive fiscal impacts for the City through the creation of jobs, enhancement of property values, and generation of property taxes and development fees.	No	Yes	Partial: does not maximize jobs, property values, property taxes, and fees

[page left blank intentionally]

Chapter 6
Other CEQA Considerations

This chapter discusses mandatory findings of significance pursuant to California Environmental Quality Act (CEQA) Guidelines Section 15065(a). This chapter also discusses significant environmental effects that cannot be avoided as identified in this Environmental Impact Report (EIR); significant irreversible environmental changes, including energy and consumption of nonrenewable resources; and growth-inducing impacts pursuant to CEQA Guidelines Section 15126.2.

6.1 Mandatory Findings of Significance

CEQA Guidelines Section 15065(a) requires a lead agency to find that a project may have a signficant effect on the environrment and thereby require an EIR if that project has the potential to have particular impacts, as described below.

6.1.1 Quality of the Environment

CEQA Guidelines Section 15065(a)(1) requires a lead agency to find that a project may have a signficant effect on the environrment and thereby require an EIR if that project "has the potential to substantially degrade the quality of the environment."

This EIR, in its entirety, addresses and discloses all potential environmental impacts associated with construction and operation of the proposed project, including direct, indirect, and cumulative impacts. As described in Chapter 4, *Environmental Setting, Impacts, and Mitigation*, the proposed project would have no impact or a less-than-significant impact associated with aesthetics, agricultural and forest resources, energy, geology and soils (including seismic hazards), hazards and hazardous materials, hydrology, land use, mineral resources, population and housing, public services, recreation, utilties, and wildfire. Environmental impacts associated with air quality, biological resources, cultural resources (including tribal cultural resources), geology and soils (including paleontology), greenhouse gas (GHG) emissions (exept vehicle miles traveled [VMT] impacts), noise and vibration, and transportation and circulation (except VMT impacts) are considered less than significant or less than significant with mitigation. Transportation and circulation and GHG emissions impacts related to VMT are considered significant and unavoidable, as discussed in Section 6.3, *Significant Environmental Effects that Cannot Be Avoided*. Based on the potential impacts of the project related to transportation and circulation and GHG emissions, the proposed project would have the potential to degrade the quality of the environment,

6.1.2 Impacts on Species

CEQA Guidelines Section 15065(a)(1) states that a lead agency shall find that a project may have a significant effect on the environment and thereby require an EIR where there is substantial evidence that the project has the potential to (1) substantially reduce the habitat of a fish or wildlife species; (2) cause a fish or wildlife population to drop below self-sustaining levels; or (3) substantially reduce the number or restrict the range of an endangered, rare, or threatened species. Section 4.3, *Biological Resources*, of this draft EIR addresses any impacts that might relate to the reduction of fish or wildlife habitat, the reduction of fish or wildlife populations, and the reduction or restriction of the range of special-status species as a result of project implementation. The proposed project would have no impact, a less-than-significant impact, or a less-than-significant impact with mitigation with respect to biological imapcts and, therefore, would not have the potential 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, or substantially reduce the number or restrict the range of a rare or endangered plant or animal.

6.1.3 Impacts on Historical Resources

CEQA Guidelines Section 15065(a)(1) states that a lead agency shall find that a project may have a significant effect on the environment and thereby require an EIR where there is substantial evidence that the project has the potential to eliminate important examples of a major period of California history or prehistory. CEQA Guidelines Section 15065(a)(1) amplifies Public Resources Code Section 21001(c) by requiring preservation of major periods of California history for the benefit of future generations. It also reflects the provisions of Public Resource Code Section 21084.1 in requiring a finding of significance for substantial adverse changes to historical resources. CEQA Guidelines Section 15064.5 establishes standards for determining the significance of impacts to historical resources and archaeological sites that are an historical resource. Section 4.4, *Cultural Resources*, of this draft EIR addresses impacts related to California history and prehistory, historic resources, archaeological resources, and tribal cultural resources. Section 4.6, *Geology and Soils*, of this draft EIR addresses impacts related to paleontological resources. The proposed project would have either no impact or a less-than-significant impact with mitigation with respect to cultural resources, tribal and cultural resources, and paleontological resources and, therefore, would not have the potential to eliminate important examples of the major periods of California history or prehistory.

6.1.4 Long-Term Impacts

CEQA Guidelines Section 15065(a)(2) states that a lead agency shall find that a project may have a significant effect on the environment and thereby require an EIR where there is substantial evidence that the project has the potential to achieve short-term environmental goals to the disadvantage of long-term environmental goals. Section 6.3, *Significant Environmental Effects that Cannot Be Avoided*, below, identifies all significant and unavoidable impacts that could occur, thereby creating a long-term impact on the environment. Section 6.4, *Significant Irreversible Environmental Changes*, below, addresses the short-term and irretrievable commitment of natural resources to ensure that the consumption is justified on a long-term basis. Lastly, Section 6.5, *Growth-Inducing Impacts*, identifies any long-term environmental impacts caused by the proposed project with respect to economic or population growth.

6.1.5 Impacts on Human Beings

CEQA Guidelines Section 15065(a)(4) states that a lead agency shall find that a project may have a significant effect on the environment and thereby require an EIR where there is substantial evidence that the environmental effects of a project will cause substantial adverse effects on human beings, either directly or indirectly. As described in Chapter 4, *Environmental Setting,* *Impacts, and Mitigation*, the proposed project would have no impact or a less-than-significant impact associated with aesthetics, agricultural and forest resources, energy, geology and soils (including seismic hazards), hazards and hazardous materials, hydrology, land use, mineral resources, population and housing, public services, recreation, utilities, and wildfire. Environmental impacts associated with air quality, biological resources, cultural resources (including tribal cultural resources), geology and soils (including paleontology), GHG emissions (exept VMT impacts), noise and vibration, and transportation and circulation (except VMT impacts) are considered less than significant or less than significant with mitigation. Transportation and circulation and GHG emissions impacts related to VMT are considered significant and unavoidable, as discussed in Section 6.3, *Significant Environmental Effects that Cannot Be Avoided*.

6.2 Cumulative Impacts

An EIR is required to examine cumulative impacts. California Code of Regulations Section 15130(a)(1), defines a cumulative impact as consisting "of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts." The analysis of cumulative impacts need not provide the same level of detail as that for project-specific impacts, but it shall "reflect the severity of the impacts and their likelihood of occurrence" (per California Code of Regulations Section 15130(b)). CEQA Guidelines Section 15065 states that a lead agency shall find that a project may have a significant effect on the environment where there is substantial evidence that the project has potential environmental effects that are individually limited but cumulatively considerable. As defined in CEQA Guidelines Section 15065(a)(3), cumulatively considerable means "that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects." The cumulative impacts analysis in an EIR must analyze either a list of past, present, and probable future projects or a summary of projections contained in an adopted general plan or related planning document.

The cumulative impact analysis in this draft EIR generally employs either a list-based approach or a projections approach, depending on which approach best suits the individual resource topic being analyzed. A list of the reasonably foreseeable future projects used to analyze cumulative impacts under most topics is provided in Section 4.1.5, *Approach to Cumulative Impact Analysis*, and shown in Figure 4.1-1. For transportation, GHG emissions, air quality, and energy, a projections approach was used to analyze cumulative impacts. Cumulative impacts related to each environmental topic are discussed in Chapter 4, *Environmental Setting, Impacts, and Mitigation*. As described in Chapter 4, either there would be no cumulative impacts, cumulative impacts would be less than significant, or the project would have a less than cumulatively considerable contribution (either with or without mitigation) to significant cumulative impacts in the areas of: aesthetics, air quality, agricultural and forest resources, biological resources, cultural resources, energy, geology and soils, greenhouse gas emissions, hazards and hazardous materials, hydrology, land use, mineral resources, noise and vibration, population and housing, public services, recreation, utilities, and wildfire. However, Chapter 4 identifies significant and unavoidable cumulative GHG emissions impacts and transportation and circulation impacts to which the project's contribution would be cumulatively considerable, as discussed below.

6.3 Significant Environmental Effects that Cannot Be Avoided

In accordance with CEQA Section 21067 and with CEQA Guidelines Sections 15126(b) and 15126.2(b), the purpose of this section is to identify significant environmental impacts that could not be eliminated or reduced to less-than-significant levels by implementation of mitigation measures included in the proposed project or identified in Chapter 4, *Environmental Setting, Impacts, and Mitigation*. The findings of significant impacts are subject to final determination by the City of South San Francisco Planning Commission as part of the certification process for this EIR.

The proposed project would result in significant and unavoidable project-level impacts and cumulatively considerable contributions to significant and unavoidable cumulative impacts related to transportation and circulation and GHG emissions. No other environmental topics discussed in Chapter 4 would result in significant and unavoidable environmental effects. As described in detail in Section 4.7, *Greenhouse Gas Emissions*, and Section 4.9, *Transportation and Circulation*, these significant and unavoidable impacts are listed below.

- **Impact GHG-1b: The proposed project would generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment during operation.** The proposed project would result in a net loss of trees, reducing carbon sequestration in the land use sector. Implementation of Mitigation Measures GHG-2 would plant additional trees on existing surface parking lots but would still result in a net loss of trees. In addition, the proposed project would not achieve the 16.8 percent VMT per service population reduction target. The proposed project would be subject to regulatory programs related to fuel and vehicle efficiency as well as vehicle electrification. In addition, implementation of Mitigation Measure TR-1, as discussed in Section 4.9, *Transportation and Circulation*, would contribute a fair share toward funding the design and construction of off-site improvements to support the proposed project's first- and last-mile transit connection strategies, which are necessary to support reductions in the number of trips made by automobile. These improvements include fair-share contributions toward the City's cost of upgrading sidewalks, upgrading and extending bicycle and pedestrian pathways, providing a more direct connection to on-street shuttle stops, participating in first/last shuttle programs, striping unmarked crosswalks, and contributing to bicycle and pedestrian infrastructure. However, the lead agency cannot determine with certainty that implementation of Mitigation Measure TR-1 would reduce the proposed project's VMT to a less-than-significant level because there are a range of GHG reductions associated with the measures in TR-1, making precise quantification of reductions difficult. Consequently, although emissions from the stationary-source, area, energy, waste, and water sectors would generally be consistent with the Bay Area Air Quality Management District's (BAAQMD's) stationary threshold or the scoping plan and regulatory programs, land use and mobile-source emissions from the proposed project would not be consistent with the scoping plan measures outlined to reduce GHG emissions consistent with the State's goals. Therefore, operational GHG impacts would be significant and unavoidable with mitigation.
- **Impact GHG-2: The proposed project would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.** Stationary-source emissions would be below BAAQMD's stationary-source threshold. In addition, the proposed project would achieve U.S. Green Building Council Leadership in Energy and Environmental Design (LEED) Gold certification and implement sustainability measures, such as waste

diversion programs and water reduction measures, consistent with the 2017 scoping plan. This would reduce GHG emissions and associated impacts from area energy, water, and waste sources to less-than-significant levels. These reductions would help the State meet its GHG reduction goals. However, the proposed project would not be consistent with the scoping plan's overall goal of avoiding losses in carbon sequestration, given the net tree loss despite implementation of Mitigation Measure GHG-2. In addition, implementation of Mitigation Measure TR-1 would reduce mobile-source emissions during operation but would not reduce emissions enough to meet the 16.8 percent VMT per service population reduction target developed by CARB. Therefore, the GHG impacts of the proposed project would be significant and unavoidable with mitigation because the project would not be consistent with State goals to reduce GHG emissions.

- **Impact TR-1: Existing home-based work (HBW) VMT per employee in the travel demand model transportation analysis zone (TAZ) that encompasses the project result in greater than 16.8 percent below the regional average HBW VMT per employee under existing plus project and cumulative plus project conditions.** The project would generate approximately 16.2 HBW VMT per employee under existing conditions, which is greater than the per-employee significance threshold of 11.8 HBW VMT (based on a VMT rate of reduction of 16.8 percent below the regional average of 14.2 HBW VMT per employee). Therefore, the project would have a significant impact on VMT under existing plus project conditions. Under cumulative conditions, the project would generate approximately 14.0 HBW VMT per employee, which is greater than the per-employee significance threshold of 12.1 HBW VMT (based on a VMT rate 16.8 percent below the regional average of 14.6 HBW VMT per employee). Therefore, the project would have a significant impact on VMT under cumulative plus project conditions. Mitigation Measure TR-1 would support and enhance the effectiveness of the project's last-mile transit connection strategies but would be unlikely to substantially reduce HBW VMT per employee, and would aid in reducing project auto travel demand. It is appropriate mitigation under both the existing plus project and cumulative plus project conditions; however, its effectiveness is unknown and is unlikely to reduce the project's HBW VMT by 27 percent (i.e., the amount needed to reduce the project's HBW VMT per employee of 16.2 to the 11.8 threshold, to reach a less-than-significant level). Therefore, this impact would be significant and unavoidable with mitigation.

6.4 Significant Irreversible Environmental Changes

In accordance with CEQA Section 21100(b)(2)(B), and CEQA Guidelines Section 15126.2(c), an EIR must identify any significant irreversible environmental changes that could result from implementation of the proposed project. An EIR is required to consider whether "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 non-use thereafter unlikely" (per CEQA Guidelines Section 15126.2(c)). "Nonrenewable resource" refers to the physical features of the natural environment, such as land, waterways, etc. This may include current or future uses of non-renewable resources and secondary or growth-inducing impacts that commit future generations to similar uses. According to the CEQA Guidelines, irretrievable commitments of resources should be evaluated to ensure that such current consumption is justified.

Chapter 4, *Environmental Setting, Impacts, and Mitigation*, discusses topics that could potentially be affected by irreversible environmental impacts, such as agricultural and forestry resources, biological resources, cultural resources, energy, hydrology, and population and housing. None of these environmental topics were found to have significant impacts as a result of the proposed project.

No significant irreversible environmental damage related to hazardous materials is anticipated to occur with implementation of the proposed project. Compliance with federal, state, and local regulations related to office/research and development (R&D) uses identified in Section 4.10.3, *Hazards and Hazardous Materials*, would ensure that the possibility that hazardous substances from the demolition, construction, and operation of the proposed project would not cause significant and unavoidable environmental damage.

The proposed project would involve excavation of soils for grading and to accommodate utility trenches. Grading would be required for general site preparation and for proper on-site stormwater flows, but the proposed project would not substantially raise or lower the existing grade. Grading would not be excessive or greater than what is necessary to achieve stormwater goals.

Construction and implementation of the proposed project would not result in a large commitment of natural resources, require highway improvements to previously inaccessible areas, or cause irreversible damage due to environmental accidents. No other irreversible permanent changes such as those that might result from construction of a large-scale mining project, hydroelectric dam, or other industrial project would result from development of the proposed project.

6.4.1 Energy and Consumption of Nonrenewable Resources

Section 21100(b)(3) of CEQA requires that EIRs include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing any inefficient, wasteful, and unnecessary consumption of energy. Implementation of the proposed project would commit future generations to an irreversible commitment of energy resources in the form of usage of nonrenewable fossil fuels due to vehicle and equipment use during demolition, construction, and operation of the proposed project. See Section 4.5, *Energy*, of this draft EIR, for a discussion of the project's impacts related to electricity, natural gas, and transportation fuel demand.

Consumption of nonrenewable resources includes increased energy consumption, conversion of agricultural lands to urban uses, and loss of access to mineral reserves. No agricultural lands would be converted and no access to mining reserves would be lost with construction of the proposed project.

Resources consumed during demolition, construction, and operation would include lumber, concrete, gravel, asphalt, masonry, metals, and water. Similar to the existing uses on the project site, the proposed project would irreversibly use water and solid waste landfill resources. However, the proposed project would not involve a large commitment of resources relative to existing conditions or relative to supply, nor would it consume any of those resources wastefully.

The proposed project would redevelop an existing surface parking lot on an infill site in an urbanized area that currently serves R&D and office uses with a new state-of-the-art R&D facility and office building, with the goal to continue to attract biotech and R&D, as well other life science uses, as described in Sections 3.1.1, *Project Objectives*, 4.10.5, *Land Use*, and 4.10.7, *Population and Housing*. The project site is serviced by existing water, wastewater, stormwater, natural gas, electric, telecommunications, and waste and recycling services. New on-site facilities would be connected to new services through the installation of new, localized connections. Expansion of or an increase in capacity of off-site infrastructure would occur as required by the utility providers. Section 4.10.10, *Utilities*, describes the water supply and demand aspects of the proposed project. The proposed project includes several water conservation features. For example, the proposed project would achieve LEED Gold certification or equivalent and install low-flow fixtures. Outdoor water conservation measures would include the installation and maintenance of water-efficient landscaping with low-usage plant material to minimize irrigation requirements. Therefore, the proposed project would include the application of required water conservation measures and would be in conformance with policies addressing water efficiency. Compared to the mix of other existing development in South San Francisco and the region, compliance with the latest LEED Gold certification, International WELL and Fitwel Building Institute Standards, and other requirements would ensure that the proposed project would be more water efficient than all but recent buildings built to the same requirements, or buildings for which owners have chosen to exceed efficiency requirements. For these reasons, the proposed project would not result in the wasteful use of water.

6.5 Growth-Inducing Impacts

As required by CEQ Guidelines Section 15126.2(d), an EIR must consider the ways in which the proposed project could directly or indirectly foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Growth-inducing impacts can result from the elimination of obstacles to growth; through increased stimulation of economic activity that would, in turn, generate increased employment or demand for housing and public services; or from the implementation of policies or measures that do not effectively minimize premature or unplanned growth.

Growth-inducing impacts such as those associated with job increases that might affect housing and retail demand in other areas over an extended time period are difficult to assess with precision, since future economic and population trends may be influenced by unforeseeable events and business development cycles. Moreover, long-term changes in economic and population growth are often regional in scope; they are not influenced solely by changes in policies or specific development projects. Business trends are influenced by economic conditions throughout the state and country as well as around the world.

Another consideration is that the creation of growth-inducing potential does not automatically lead to growth. Growth occurs through capital investment in new economic opportunities by the private and/or public sector. Investment patterns reflect, in turn, the desires of investors to mobilize and allocate their resources to development in particular localities and regions. A combination of these and other pressures serve to fashion policy. The regulatory authority of local governments serves to mediate the growth-inducing potential or pressure created by a project or plan. Despite these limitations on the analysis, it is still possible to qualitatively assess the general potential growth-inducing impacts of the proposed project.

6.5.1 Projected Growth

Section 4.10.7, *Population and Housing*, discussed population and employment growth as a result of the proposed project and made the following findings. The proposed project does not include any new housing units and would not directly induce population growth. The proposed project would redevelop an existing parking lot on an infill site in an urbanized area that currently serves R&D and office uses with a new R&D facility and office building.

Development of infrastructure could remove obstacles to population growth if it would allow for development in an area that was not previously considered feasible for development because of infrastructure limitations. The proposed project would not include the extension of area roadways or expansion of infrastructure to areas lacking existing development. No indirect impacts related to population growth as a result of expansion of infrastructure would occur.

The existing office building on the project site at 701 Gateway Boulevard has approximately 450 employees. As stated in Chapter 3, *Project Description*, the existing office building would remain; no existing employees would be displaced as a result of the proposed project. However, the project would result in an increase of approximately 731 net new employees at the project site, and in the City, as a result of project development. As discussed in Section 4.10.7, *Population and Housing*, the proposed project's net number of newly generated employees would represent approximately 6.1 percent and less than 10 percent, respectively, of the City's total projected population and job numbers for 2040, and would not represent a substantial portion of the projected population and job growth planned for in the General Plan. Therefore, the proposed project would not result in substantial unplanned population and job growth. The project represents anticipated growth in the City.

The net new 731 employees generated as a result of the proposed project could increase demand for housing and contribute to total overall housing demand citywide. While, it is assumed that most of the employees generated by the project would be existing residents in the surrounding area, a small portion of the new employees could potentially generate new demand for housing within the City. Therefore, the analysis conservatively assumes that all employees generated by the proposed project would be new to the City, would require housing, and would contribute to the City's existing jobs/housing imbalance, which is already projected to be out of balance, according to the Association of Bay Area Government's (ABAG's) *Projections 2040*. According to the analysis, the proposed project would create the need for up to 475 new housing units upon completion. This conservatively-projected potential new housing demand resulting from the proposed project could cause indirect growth that the City may not be able to accommodate with existing and projected housing. As discussed in Section 4.10.7, *Population and Housing*, the City is primarily a jobs center that attracts employees who commute from other communities and cities to work there. This is partially because much of the land within City limits, including the project site, is not well suited for residential development because of City policy and land use designations intended to support the development of employment land uses, including office and R&D. Nonetheless, the City *does not* have an adopted jobs/housing ratio goal that would be applicable to development within the project site. However, to accommodate for the lack of developable residential land within the area surrounding the project site, as well as throughout the City, the City has adopted the Affordable Housing Commercial Linkage Fees in order to establish fees for non-residential development projects to address the effect they may have on the ratio of increased job opportunities and the demand created for affordable housing. The proposed project would be required to pay these fees, which would contribute to the development of affordable housing in other locations within the City. In addition, the proposed project would promote greater regional balance between jobs and housing and woud be within an area with comptiable land uses, consistent with the General Plan and specific plan designations. Therefore, the proposed project would have a less-than-significant indirect impact on population growth.

Overall, the proposed project would be an appropriate land use for the project site's limitations, and the job growth that would occur under the proposed project would be within the projected employment growth of the City. The proposed project would not induce direct or indirect population growth.

Chapter 7
List of Report Preparers

7.1 Lead Agency

City of South San Francisco
Community and Economic Development Department
Planning Division
315 Maple Avenue
South San Francisco, CA 94080
Adena Friedman, Senior Planner

7.2 Consulting Team

ICF
201 Mission Street, Suite 1500
San Francisco, CA, 94105
Heidi Mekkelson, Project Director
Jessica Viramontes, Project Manager
Devan Atteberry, Project Coordinator
Sandy Lin, Air Quality, Greenhouse Gas, and Climate Change Specialist
Liz Foley, Noise Specialist
Aileen Cole, Environmental Planner
Danielle Tannourji, Biologist
Ross Wilming, Biologist
Christiaan Havelaar, Archaeologist
Erik Allen, Archaeologist
Diana Roberts, Environmental Planner
Patrick Maley, Environmental Planner
Mario Barrera, Environmental Planner
Katrina Sukola, Hydrology and Water Quality Specialist
Zetta Quick, Environmental Planner
Alan Barnard, Graphic Artist
Anthony Ha, Publications Specialist
John Mathias, Editor and Publications Specialist

Fehr & Peers
332 Pine Street, Fourth Floor
San Francisco, CA 94014
Mike Hawkins, Transportation Engineer/Planner
Teresa Whinery, Transportation Engineer/Planner

7.3 Project Sponsor Team

701 Gateway Center LLC
1700 Owens Street, Suite 590
San Francisco, CA, 94158
Toon Jordan, Vice President, Real Estate Development and Design

Cox Castle Nicholson
50 California Street, Suite 3200
San Francisco, CA 94111
Margo Bradish, Partner

RMW Architects
160 Pine Street, Fourth Floor
San Francisco, CA 94111
Steve Worthington, Principal
Stan Lew, Principal

7.4 Organizations and Persons Consulted

City of South San Francisco
Engineering Division
315 Maple Avenue
South San Francisco, CA 94080
Jason Hallare, Senior Engineer

City of South San Francisco
Public Works Department
Water Quality Division
195 Belle Air Road
South San Francisco, CA 94080
Brian Schumacker, Plant Superintendent

City of South San Francisco
City Attorney's Office
400 Grand Avenue
South San Francisco, CA 94080
Claire Lai, Assistant City Attorney

Appendix A
Notice of Preparation and Comments

NOTICE OF PREPARATION
OF AN EIR FOR THE PROPOSED
751 GATEWAY BOULEVARD PROJECT

To: Agencies, Organizations, and Interested Parties

From: City of South San Francisco, Economic and Community Development Department

Subject: Notice of Preparation (NOP) of an Environmental Impact Report (EIR) in Compliance with Title 14, Sections 15082(a), 15103, and 15375 of the California Code of Regulations (CCR). The City of South San Francisco (City) is the Lead Agency under the California Environmental Quality Act (CEQA) for the proposed project identified below. The City will prepare an EIR for the proposed project identified below:

Project Title: 751 Gateway Boulevard Project. The project location and a summary of the project description are included below and on the following page.

Current Environmental Review: To ensure that the proposed project is fully analyzed under CEQA, an EIR will be prepared in compliance with Title 14, Section 15161 of the CCR. An Initial Study has not been prepared. The EIR will address all environmental topic areas.

Agency/Public Comments: The City requests your comments regarding the scope and content of the environmental review to be conducted for the proposed project. Due to the time limits mandated by State law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice. The City will accept written comments on this NOP between January 21, 2020 and February 20, 2020. Please send your comments by email to adena.friedman@ssf.net or by mail to: City of South San Francisco, Department of Economic and Community Development, 315 Maple Street, South San Francisco, CA 94080, Attention: Adena Friedman, Senior Planner.

Scoping Meeting: The Lead Agency will conduct a scoping meeting on January 30, 2020, beginning at 3:00 PM, in the Annex Conference Room, 315 Maple Avenue, South San Francisco, California, at which agencies, organizations, and the public will have an opportunity to submit verbal comment. Please note that verbal comments are limited to three minutes per speaker.

EIR Process: Following the close of the NOP comment period, a Draft EIR will be prepared that will consider all environmental topic areas in Appendix G of the CEQA Guidelines and take into consideration NOP comments. In accordance with Title 14, Section 15105(a) of the CCR, the Draft EIR will be released for public review and comment for the required 45-day review period. Following the close of the 45-day public review period, the City will prepare a Final EIR that will include responses to all substantive comments received on the Draft EIR. The Draft EIR and Final EIR will be considered by the Planning Commission in making the decision to certify the EIR and to approve or deny the project.

Project Location & Existing Conditions: The project site is part of the City's "Gateway Specific Plan" planning area, which is bounded by Oyster Point Boulevard to the north, Eccles Avenue to the east, East Grand Avenue to the south, and the Caltrain right-of-way to the west. The 7.4-acre project site (Assessor's Parcel Numbers 015-024-290 and 015-024-360) consists of a 6-story, approximately 176,000-square foot office building at 701 Gateway Boulevard and a surface parking lot containing approximately 564 parking spaces. The project site is located in the Gateway Campus and is bounded by a commercial and office building (901 Gateway Boulevard) and a surface parking lot to the north, Gateway Boulevard to the east, a surface parking lot to the south, and commercial and office buildings to the west (Figure 1). The proposed project would be constructed on the site of an existing surface parking lot.

Project Description: The proposed project would maintain the existing zoning designation of Zone IV under the Gateway Specific Plan District. The existing zoning allows for development at a floor area ratio (FAR) of 1.25 or maximum of 400,578 square feet within the project site. The existing building at 701 Gateway Boulevard includes a total square footage of approximately 176,000 square feet. Based on the zoning, there are 227,082 square feet of unrealized FAR associated with the 701 Gateway Boulevard portion of the project site. The proposed project would use a portion of the unrealized FAR associated with 701 Gateway Boulevard, and the proposed FAR for the site, including the proposed building at 751 Gateway Boulevard, would be 1.20.

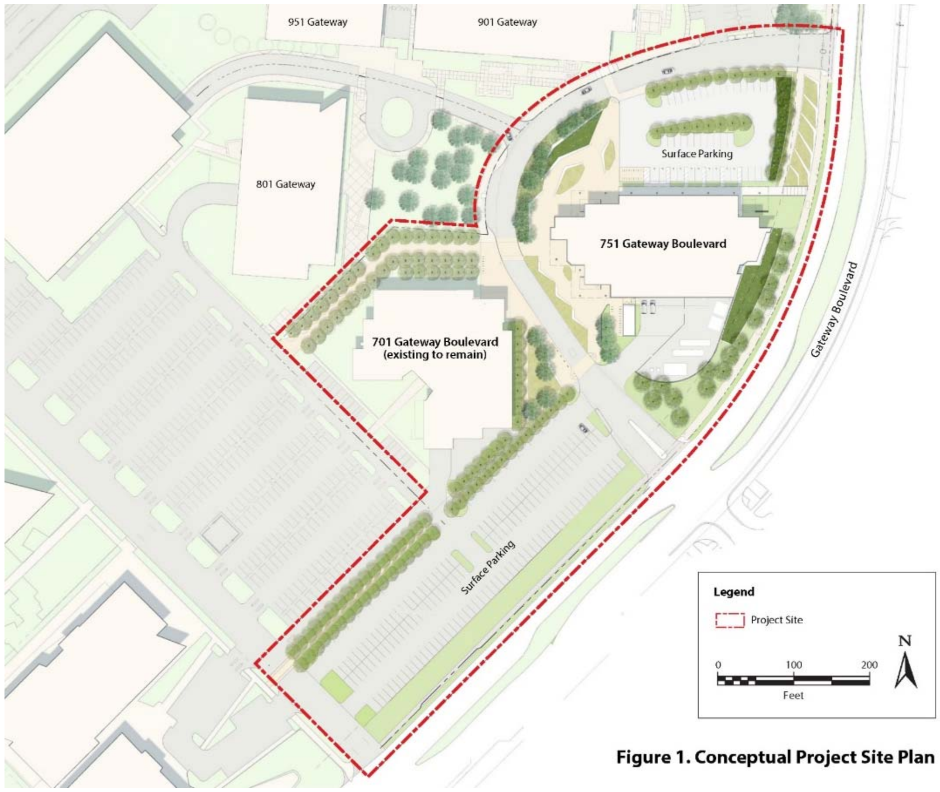


Figure 1. Conceptual Project Site Plan

The proposed project would construct a new 148-foot-tall, 7-story building with approximately 208,800 square feet of lab and office uses on the existing surface parking lot. The existing office building at 701 Gateway Boulevard would be retained. The ground floor of the proposed building would include a "through lobby" with access from the north and south; the lobby would include an amenity space. An entry plaza and landscaped visitor lot would be constructed north of the proposed building. An entrance and screened service yard would be constructed south of the proposed building. The proposed project would improve pedestrian connections between the nearby Gateway Campus buildings at 701, 901, 951 and 801 Gateway Boulevard by creating a pedestrian hub. The proposed project would also include surface parking lots with a total of 418 parking spaces (including 46 parking spaces in a lot north of the proposed building) that would be used by other buildings within the Gateway Campus. Construction of the proposed project would begin in 2020 and occur over approximately 18 months, with anticipated completion in 2021. It is anticipated that the first stage of construction would consist of demolition activities, utility work, and other site preparation.

Probable Environmental Impacts: Each of the following CEQA environmental issue areas will be addressed in the EIR: Aesthetics, Agriculture and Forestry Resources, Air Quality, Biological Resources, Cultural Resources, Energy Resources, Geology and Soils, Greenhouse Gas Emissions, Hazards and Hazardous Materials, Hydrology and Water Quality, Land Use and Planning, Mineral Resources, Noise and Vibration, Population and Housing, Public Services, Recreation, Tribal Cultural Resources, Utilities and Service Systems, Transportation and Traffic, and Wildfire. There is reasonable potential that the project may result in environmental effects related to regional Air Quality, Noise, and Transportation and Traffic; thus, it is anticipated that these topics will be discussed in detail in the EIR.

Date: January 14, 2020

Adena Friedman, Senior Planner
Telephone: (650) 877-8535
Email: adena.friedman@ssf.net

STATE OF CALIFORNIA
Governor's Office of Planning and Research
State Clearinghouse and Planning Unit

Gavin Newsom
Governor

Kate Gordon
Director

Notice of Preparation

RECEIVED
JAN 23 2020
PLANNING DEPT.

January 21, 2020

To: Reviewing Agencies

Re: 751 Gateway Boulevard Project
SCH# 2020010281

Attached for your review and comment is the Notice of Preparation (NOP) for the 751 Gateway Boulevard Project 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:

Adena Friedman
South San Francisco, City of
315 Maple Avenue
South San Francisco, CA 94080

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/2020010281/2.

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

Appendix C

Notice of Completion & Environmental Document Transmittal

2020010281

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

SCH #

Project Title: 751 Gateway Boulevard Project

Lead Agency: City of South San Francisco — Contact Person: Adena Friedman
Mailing Address: 315 Maple Street — Phone: (650) 877-8535
City: South San Francisco — Zip: 94080 — County: San Mateo

Project Location: County: San Mateo — City/Nearest Community: South San Francisco
Cross Streets: Gateway Boulevard and Oyster Point Boulevard — Zip Code: 94080
Longitude/Latitude (degrees, minutes and seconds): 37 ° 39 ′ 38.7 ″ N / 122 ° 23 ′ 48.0 ″ W Total Acres: 7.4
Assessor's Parcel No.: 015-24-290 and 015-24-360 — Section: ____ Twp.: T3S Range: R5W Base: Mt. Diablo
Within 2 Miles: State Hwy #: US 101 — Waterways: San Francisco Bay, Colma Creek, San Bruno Canal
Airports: San Francisco International Airport — Railways: Caltrain, UPRR — Schools: Martin Elementary, Spruce Elementary

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: ☐ Joint Document ☐ Final Document ☐ Other: ____

Governor's Office of Planning & Research

JAN 21 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: ____

Development Type:

☐ Residential: Units ____ Acres ____
☒ Office: Sq.ft. 208,800 Acres ____ Employees up to 850
☐ Commercial: Sq.ft. ____ Acres ____ Employees ____
☐ Industrial: Sq.ft. ____ Acres ____ Employees ____
☐ Educational: ____
☐ Recreational: ____
☐ Water Facilities: Type ____ MGD ____
☐ Transportation: Type ____
☐ Mining: Mineral ____
☐ Power: Type ____ MW ____
☐ Waste Treatment: Type ____ MGD ____
☐ Hazardous Waste: Type ____
☒ Other: Retain 6-story office building at 701 Gateway Boulevard

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: Energy/Wildfire/GHG

Present Land Use/Zoning/General Plan Designation:

The Project site is zoned IV under the Gateway Specific Plan and is designated Business Commercial.

Project Description: *(please use a separate page if necessary)*

The proposed project would construct a new 148-foot-tall, 7-story building with approximately 208,800 square feet of lab and office uses on the existing surface parking lot. The existing office building at 701 Gateway Boulevard would be retained. The ground floor of the proposed building would include a "through lobby" with access from the north and south; the lobby would include an amenity space. An entry plaza and landscaped visitor lot would be constructed north of the proposed building. An entrance and screened service yard would be constructed south of the proposed building. The proposed project would improve pedestrian connections between the nearby Gateway Campus buildings at 701, 901, 951 and 801 Gateway Boulevard by creating a pedestrian hub. The proposed project would also include surface parking lots with a total of 418 parking spaces (including 46 parking spaces in a lot north of the proposed building) that would be used by other buildings within the Gateway Campus.

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 Mateo dR **SCH#** 2020010281

Resources Agency

- [x] **Resources Agency**
  Nadell Gayou
  - [ ] **Dept. of Boating & Waterways**
    Denise Peterson
  - [ ] **California Coastal Commission**
    Allyson Hitt
  - [ ] **Colorado River Board**
    Elsa Contreras
  - [x] **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
- [x] **Fish & Wildlife Region 2**
  Jeff Drongesen
- [ ] **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

- [ ] **California Department of Education**
  Lesley Taylor
- [ ] **OES (Office of Emergency Services)**
  Monique Wilber
- [ ] **Food & Agriculture**
  Sandra Schubert
  Dept. of Food and Agriculture
- [ ] **Dept. of General Services**
  Cathy Buck
  Environmental Services Section
- [ ] **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

- [x] **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**
  Mark Leong
- [ ] **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
- [ ] **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
- [x] **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)
- [ ] **Other** ________________
  ____
  ____
- [ ] ________________
  Conservancy

Last Updated 11/20/19

CHAIRPERSON
Laura Miranda
Luiseño

VICE CHAIRPERSON
Reginald Pagaling
Chumash

SECRETARY
Merri Lopez-Keifer
Luiseño

PARLIAMENTARIAN
Russell Attebery
Karuk

COMMISSIONER
Marshall McKay
Wintun

COMMISSIONER
William Mungary
Paiute/White Mountain Apache

COMMISSIONER
Joseph Myers
Pomo

COMMISSIONER
Julie Tumamait-Stenslie
Chumash

COMMISSIONER
[Vacant]

EXECUTIVE SECRETARY
Christina Snider
Pomo

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento, California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

STATE OF CALIFORNIA **Gavin Newsom, Governor**

NATIVE AMERICAN HERITAGE COMMISSION

RECEIVED
JAN 30 2020
PLANNING DEPT.

January 23, 2020

Adena Friedman
South San Francisco, City of
315 Maple Avenue
South San Francisco, CA 94080

Re: 2020010281, 751 Gateway Boulevard Project, San Mateo County

Dear Ms. Friedman:

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

RECEIVED

FEB 03 2020

PLANNING DEPT.

County of San Mateo
Department of Public Works
Utilities-Flood Control-Watershed Protection

751 GATEWAY BOULEVARD PROJECT
751 Gateway Boulevard, South San Francisco

To: Adena Friedman, Senior Planner, 315 Maple Street, South San Francisco, CA 94080

From: MC Mark Chow, P.E., Principal Civil Engineer, Utilities-Flood Control-Watershed Protection Section

e-cc: Ann Stillman, P.E., Deputy Director, Engineering & Resource Protection Division

Larry Patterson, Interim Chief Executive Officer, San Mateo County Flood and Sea Level Rise Resiliency District, 1700 S. El Camino Real, Suite 502, San Mateo, CA 94402

Krzysztof Lisaj, P.E., Senior Civil Engineer, Utilities-Flood Control-Watershed Protection

Tiffany Deng, P.E., Associate Civil Engineer, Utilities-Flood Control-Watershed Protection

Date: January 27, 2020

Subject: Colma Creek Flood Control Zone Review, 751 Gateway Boulevard, South San Francisco, Submittal #1

Reason for Review: **Notice of Preparation (NOP) of an Environmental Impact Report (EIR)**

Reviewer: Tiffany Deng

Submittal/Review No.: #1

The County of San Mateo Department of Public Works, in its capacity as a consultant for the San Mateo County Flood and Sea Level Rise Resiliency District (District) which includes the Colma Creek Flood Control Zone (Zone) has reviewed the document identified above for the subject project and offers the following comments:

<u>All</u> comments must be addressed and incorporated into a modified, complete set of plans for re-submittal. Subsequent re-submittals will be returned without review comments if the District determines that all previous comments have not been addressed. Your careful attention to our comments and providing re-submittals that adequately address our comments will assist in completing the review process in a timely fashion.

Flood Control Zone Comments

1. According to the NOP, the proposed project site consists of two separate parcels: APN 015-024-290 (Parcel 1) and APN 015-024-360 (Parcel 2).

2. District records show that Parcel 1 is located outside of the Zone. Since this portion of the project site is located outside of the Zone boundaries and does not contribute financially to the Zone's revenue and maintenance of the District's facilities, storm water runoff from this parcel must not be directed to drain into City of South San Francisco storm drain lines which ultimately enter the District's flood control channel. We request that you provide us with a copy of the as built drawings when completed for our review and record.

3. District records show that Parcel 2 is located within the Zone. The District requires that the discharge rate from the site not exceed the existing rate prior to development, and drainage analyses and calculations showing existing and future discharge rates must be submitted for review and approval. If it is determined that the future discharge rate exceeds the existing rate, an on-site storm water detention system, which would release surface runoff at a rate comparable to the existing flow rate of the site must be designed and incorporated into the project.

4. The City of South San Francisco shall provide a copy of the Environmental Impact Report (EIR) to the District for review once the report becomes available.

\\dpw.sanmateocounty.ads\data\Users\utility\Colma Creek FCD\WORD\Review External Project\City of SSF\751 Gateway Boulevard Project\751 Gateway Blvd_EIR_NOP_Comments.docx

NOTICE OF PREPARATION
OF AN EIR FOR THE PROPOSED
751 GATEWAY BOULEVARD PROJECT

To: Agencies, Organizations, and Interested Parties

From: City of South San Francisco, Economic and Community Development Department

Subject: Notice of Preparation (NOP) of an Environmental Impact Report (EIR) in Compliance with Title 14, Sections 15082(a), 15103, and 15375 of the California Code of Regulations (CCR). The City of South San Francisco (City) is the Lead Agency under the California Environmental Quality Act (CEQA) for the proposed project identified below. The City will prepare an EIR for the proposed project identified below:

Project Title: 751 Gateway Boulevard Project. The project location and a summary of the project description are included below and on the following page.

Current Environmental Review: To ensure that the proposed project is fully analyzed under CEQA, an EIR will be prepared in compliance with Title 14, Section 15161 of the CCR. An Initial Study has not been prepared. The EIR will address all environmental topic areas.

Agency/Public Comments: The City requests your comments regarding the scope and content of the environmental review to be conducted for the proposed project. Due to the time limits mandated by State law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice. The City will accept written comments on this NOP between January 21, 2020 and February 20, 2020. Please send your comments by email to adena.friedman@ssf.net or by mail to: City of South San Francisco, Department of Economic and Community Development, 315 Maple Street, South San Francisco, CA 94080, Attention: Adena Friedman, Senior Planner.

Scoping Meeting: The Lead Agency will conduct a scoping meeting on January 30, 2020, beginning at 3:00 PM, in the Annex Conference Room, 315 Maple Avenue, South San Francisco, California, at which agencies, organizations, and the public will have an opportunity to submit verbal comment. Please note that verbal comments are limited to three minutes per speaker.

EIR Process: Following the close of the NOP comment period, a Draft EIR will be prepared that will consider all environmental topic areas in Appendix G of the CEQA Guidelines and take into consideration NOP comments. In accordance with Title 14, Section 15105(a) of the CCR, the Draft EIR will be released for public review and comment for the required 45-day review period. Following the close of the 45-day public review period, the City will prepare a Final EIR that will include responses to all substantive comments received on the Draft EIR. The Draft EIR and Final EIR will be considered by the Planning Commission in making the decision to certify the EIR and to approve or deny the project.

Project Location & Existing Conditions: The project site is part of the City's "Gateway Specific Plan" planning area, which is bounded by Oyster Point Boulevard to the north, Eccles Avenue to the east, East Grand Avenue to the south, and the Caltrain right-of-way to the west. The 7.4-acre project site (Assessor's Parcel Numbers 015-024-290 and 015-024-360) consists of a 6-story, approximately 176,000-square foot office building at 701 Gateway Boulevard and a surface parking lot containing approximately 564 parking spaces. The project site is located in the Gateway Campus and is bounded by a commercial and office building (901 Gateway Boulevard) and a surface parking lot to the north, Gateway Boulevard to the east, a surface parking lot to the south, and commercial and office buildings to the west (Figure 1). The proposed project would be constructed on the site of an existing surface parking lot.

San Francisco International Airport

February 3, 2020

Ms. Adena Friedman
Senior Planner
City of South San Francisco
Department of Economic and Community Development
315 Maple Ave
South San Francisco, CA 94080

Subject: Notice of Preparation of an Environmental Impact Report for 751 Gateway Boulevard project – City of South San Francisco

Dear Ms. Friedman,

Thank you for notifying San Francisco International Airport (SFO or the Airport) regarding the Notice of Preparation (NOP) of an Environmental Impact Report (EIR) for the new office building and surface parking lots at 751 Gateway Boulevard (the project). We appreciate this opportunity to coordinate with the City of South San Francisco (the City) in considering and evaluating potential land use compatibility issues that this may pose.

As described in the NOP, the project site, 751 Gateway Boulevard, is located in the City's "Gateway Specific Plan" planning area, which is bounded by Oyster Point Boulevard to the north, Eccles Avenue to the east, East Grand Avenue to the south, and the Caltrains right-of-way to the west. The project includes construction of an office/laboratory building that is seven stories (208,800 square feet) approximately 148 feet in height, and surface parking lots (418 parking spaces).

Most of South San Francisco, including the proposed project site area, is located within the Airport Influence Areas A and B, as defined in the Comprehensive Airport Land Use Compatibility Plan for the Environs of SFO (ALUCP). The ALUCP was adopted by the City/County Association of Governments of San Mateo County (C/CAG) in 2012 and addresses issues related to compatibility between airport operations and surrounding proposed land use development, considering noise impacts, safety of persons on the ground and in flight, height restrictions/airspace protection, and overflight notification. The forthcoming EIR should describe the project's consistency with these ALUCP policies.

With respect to noise compatibility, the project is situated outside of the Airport's CNEL 65 dB noise contour. Additionally, the project is not situated within a runway end safety zone. Therefore, based on the information provided, the proposed project would not pose an airport land use compatibility issue with regard to noise or safety. However, the forthcoming EIR should describe the project's consistency with land use criteria within these runway end safety zones as described in ALUCP SP-1 through SP-3. Furthermore, please keep in mind many airport

Post Office Box 8097 San Francisco, California 94128 Tel 650.821.5000 Fax 650.821.5005 www.flysfo.com

departure procedures currently are designed to ascend over this area, and any overnight uses in this area could experience some noise disturbances from aircraft departures. Noise impacts on sensitive receptors and any necessary mitigation measures should be fully evaluated in the EIR and the EIR should describe the project's consistency with noise policies described in ALUCP NP-1 through NP-4.

The Airport appreciates your consideration of these comments. If I can be of assistance as the City considers airport land use compatibility as they relate to this project or future projects, please do not hesitate to contact me at (650) 821-9464 or at nupur.sinha@flysfo.com.

Sincerely,

Nupur Sinha
Acting Planning Director
Planning and Environmental Affairs

cc: Susy Kalkin, Airport Land Use Committee
Sandy Wong, C/CAG
Nixon Lam, SFO, Environmental Affairs Manager

Appendix B
Air Quality and Greenhouse Gas Materials

Unmitigated Criteria Air Pollutant Emissions during Construction (pounds/day)

	ROG	NOX	CO	PM10 Dust	PM10 Exhaust	PM2.5 Dust	ᴾM2.5 Exhaust
2020	7	68	41	1	2	0	2
2021	29	46	31	14	1	3	5
BAAQMD Threshold	54	54	-	BMPs	82	BMPs	54
Exceed Threshold?	No	Yes	No	-	No	-	No

Mitigated Criteria Air Pollutant Emissions during Construction (pounds/day)

	ROG	NOX	CO	PM10 Dust	PM10 Exhaust	PM2.5 Dust	PM2.5 Exhaust
2020	2	14	78	1	0	0	1
2021	28	11	62	14	0	3	4
BAAQMD Threshold	54	54	-	BMPs	82	BMPs	54
Exceed Threshold?	No	No	No	-	No	-	No

Unmitigated Criteria Air Pollutant Emissions during Operation (pounds/day)

	ROG	NOX	CO	PM10	PM2.5
Existing					
Area	4	0	0	0	0
Energy	0	1	1	0	0
Mobile	2	9	42	36	9
Stationary	3	15	9	0	0
Total	10	25	52	37	10
701 Gateway					
Area	4	0	0	0	0
Energy	0	1	1	0	0
Mobile	2	7	36	36	9
Stationary	3	15	9	0	0
751 Gateway					
Area	5	0	0	0	0
Energy	0	1	1	0	0
Mobile	3	12	58	59	15
Stationary	3	15	9	0	0
Total	21	51	112	96	26
Net Increase with 751 Gatew	*11*	*26*	*61*	*59*	*16*
BAAQMD Threshold	54	54	-	82	54
Exceed Threshold?	No	No	No	No	No

GHG Emissions during Construction (MTCO2e/year)

	C02	CH4	N20	CO2e
2020	843	0.09	0.00	845
2021	488	0.08	0.00	490
Total	1,331	0	0	1,335

Estimated Operational GHG Emissions from the Proposed Project (metric tons)

	C02	CH4	N20	CO2e	%
Existing					
Area	0	0	0	0	0%
Energy	398	0	0	401	14%
Mobile	2,331	0	0	2,360	82%
Stationary	39	0	0	39	1%
Waste	32	2	0	80	3%
Water	2	0	0	4	0%
Total	2,802	2	0	2,884	100%
701 Gateway					
Area	0	0	0	0	0%
Energy	382	0	0	385	5%
Mobile	2,229	0	0	2,256	31%
Stationary	39	0	0	39	1%
Waste	32	2	0	80	1%
Water	2	0	0	4	0%
751 Gateway					
Area	0	0	0	0	0%
Energy	649	0	0	655	9%
Mobile	3,619	0	0	3,662	51%
Stationary	39	0	0	39	1%
Waste	19	1	0	48	1%
Water	3	0	0	7	0%
Total	7,014	3	0	7,176	-
Net Increase from Existing	4,212	1	0	4,292	
Land Use Emissions/Sequestration Loss				46	
Total				4,338	

Construction (Electricity)

	kwh
2020	52,000
2021	52,000

Construction (Fuel)

	Gasoline (Gallons)	Diesel (Gallons)
2020	3,346	79,400
2021	18,762	31,437

Operations (Electricity, including Water)

	Unmitigated			
Scenario	kwh/year	BTU/year	MBTU/year	therm/year
Existing (701 Gateway)	1,753,936	5,984,679,727	5,985	59,861
Project	7,252,999	24,748,260,872	24,748	247,542
701 Gateway	1,753,936	5,984,679,727	5,985	59,861
751 Gateway	5,499,063	18,763,581,145	18,764	187,681

Operations (Natural Gas)

	Unmitigiated			
Scenario	kBTU/Year	BTU/Year	MBTU/year	therm/year
Existing (701 Gateway)	4,466,600	4,466,600,000	4,467	44,677
Project	7,917,579	7,917,579,000	7,918	79,195
701 Gateway	4,466,600	4,466,600,000	4,467	44,677
751 Gateway	3,450,979	3,450,979,000	3,451	34,518

Operations (Fuel)

	Unmitigated (gallons/year)	
Scenario	Gasoline (Gallons per Year)	Diesel (Gallons Per Year)
Existing (701 Gateway)	243,226	28,680
Project	603,881	77,421
701 Gateway	230,099	29,500
751 Gateway	373,783	47,921

Operations (Water)	Unmitigated			
Scenario	Indoor (Mgal/year)	Outdoor (Mgal/year)	Total (Mgal/year)	kwh/year
Existing (701 Gateway)	2	4	6	79,956
Project	6	5	12	152,729
701 Gateway	2	4	6	79,956
751 Gateway	5	1	6	72,773

Conversions		Source
MBTU_kBTU	1.00E-06	Standard
Therm_BTU	1.00E-05	Standard
BTU_kwh	3.41E+03	Standard
kBTU_BTU	1.00E-03	Standard
kWh_mgal	13,021	CalEEMod

Construction Schedule

Phase	Start	End	Work Days Provided	Work Days Modeled	Workdays/Week
Site Prep/Demoliition	7/2/2020	8/29/2020	40	42	5
Foundations	8/9/2020	1/2/2021	100	105	5
Structure	1/3/2021	9/13/2021	195	217	6
Skin and Roof	6/10/2021	10/5/2021	81	84	5
Interior Buildout	4/2/2021	10/26/2021	143	148	5
Commissioning and Final Inspections	9/14/2021	12/2/2021	54	58	5

Construction Equipment

Phase	Equipment	Number	Horsepower	Hours/day
Site Prep/Demoliition	Excavator	1	300	8
	Crusher	1	200	8
	Dump Truck	1	300	8
Foundations	Excavator	2	300	8
	Trucks	18	400	0.5
	Concrete Pumps	5	300	8
Structure	Crane	1	400	8
	Welder	8	15	8
	Manlift	2	50	8
	Gradall (Excavator)	1	200	8
Skin & Roof	Crane	1	200	8
Interior Buildout	None	-	-	-
Commissioning and Final Inspections	None	-	-	-

Total Trips

Phase	One Way Vendor Trips	One Way Haul Trips	One Way Haul Distance	Avg Vendor/Day	Rounded
Site Prep/Demoliition	223	-		5.72	6
Foundations	705	500	40 miles	12.88	13
Structure	805	-		7.36	8
Skin and Roof	296	-		8.4	9
Interior Buildout	1050	-		8.4	9
Commissioning and Final Inspections	160	-		5.4	6
Total Trips	3239	500			

Workers

Phase	Max/Day	Trips/Day
Site Prep/Demoliition	20	40
Foundations	35	70
Structure	70	140
Skin & Roof	5	10
Interior Buildout	35	70
Commissioning and Final Inspections	90	180

Soil Import/Export

Phase	Import (CY)	Export (CY)
Site Prep/Demoliition	750	0
Foundations	0	0
Structure	0	0
Interior Buildout	0	0
Commissioning and Final Inspections	0	0

Demolition

Phase	CY	Tons
Site Prep/Demoliition	300	150
Foundations	0	0
Structure	0	0
Interior Buildout	0	0
Commissioning and Final Inspections	0	0

Grading

Phase	Max Acres/Day
Site Prep/Demoliition	1.4
Foundations	0
Structure	0
Interior Buildout	0
Commissioning and Final Inspections	0

Paving

Phase	Acres
Site Prep/Demoliition	1.4
Foundations	1.4
Structure	0
Interior Buildout	0
Commissioning and Final Inspections	0

Paving

Phase	Total Acres	Asphalt	Concrete
Site Prep/Demoliition	2.55	1.4	1.15

Foundations	1.4	0	1.4
Structure	0	0	0
Interior Buildout	0	0	0
Commissioning and Final Inspections	0	0	0

Annual Electricity Consumption	52,000	kwh

Trees Removed

Net Trees Remove	63

Source: Project Applicant

Generators

Type	Quantity	Size	LF	Testing Hours per year	Testing Hours per day
Existing (701 Gateway)	1	1200 kw/1869 hp	0.8	50	1
Proposed (751 Gateway)	1	1200 kw/1869 hp	0.8	50	1

Source: Project Description; assumed existing 701 Gateway generator to be similar to proposed

Equipment

Off-Road Equipment	None

Truck Trips/Deliveries

Misc Daily Trips	23

Source: Project Applicant; emissions associated with these trips included in VMT analysis

Operational Consumption

Land Use	Electricity (kwh)	Natural Gas (kbtu)	Water (gals)	Water (Indoor)	Water (Outdoor)
Parking Lot (751 Gateway)	0	0	0	0	0
701 Gateway	1,673,980	4,466,600	3,398,880	2,107,306	1,291,574
Per SF	9.83335	26.23785			
751 Gateway	5,426,290	3,450,979	5,588,880		
R&D			3,531,740	3,531,740	
Office			1,571,325	974,222	597,104
Retail (Café and Fitness Center)			485,815	301,205	184,610

Source: Project Applicant; assumed indoor/outdoor water useage using CalEEMod default % and annual water consumption

701 Gateway - Existing
San Mateo County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	170.24	1000sqft	3.20	170,235.00	0
Parking Lot	558.00	Space	4.20	223,200.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	70
Climate Zone	5			**Operational Year**	2019

Utility Company Pacific Gas & Electric Company

CO2 Intensity	210	**CH4 Intensity**	0.034	**N2O Intensity**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - EFs adjusted for SB 100
Land Use - sf and spaces provided by applicant; lot acreage scaled by sf
Construction Phase - operational analysis only
Off-road Equipment - operational analysis only
Off-road Equipment - operational analysis only
Off-road Equipment - operational analysis only
Off-road Equipment - operational analysis only
Off-road Equipment - operational analysis only
Off-road Equipment - operational analysis only
Trips and VMT - operational analysis only
Grading -
Architectural Coating - operational analysis only
Vehicle Trips - mobile emissions modeled separately
Energy Use - Energy consumption provided by applicant
Water And Wastewater - water usage provided by project applicant; assumed Caleemod default for general office building of 62% indoor/38% outdoor

Land Use Change -
Sequestration - provided by project applicant
Stationary Sources - Emergency Generators and Fire Pumps - assumed existing generator at 701 Gateway to have same specs as future generator at

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	85,118.00	0.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	255,353.00	0.00
tblArchitecturalCoating	ConstArea_Parking	13,392.00	0.00
tblConstructionPhase	NumDays	20.00	0.00
tblConstructionPhase	NumDays	10.00	0.00
tblConstructionPhase	NumDays	20.00	0.00
tblConstructionPhase	NumDays	230.00	0.00
tblConstructionPhase	NumDays	20.00	0.00
tblConstructionPhase	NumDays	20.00	0.00
tblEnergyUse	LightingElect	3.58	0.00
tblEnergyUse	LightingElect	0.35	0.00
tblEnergyUse	NT24E	4.80	0.00
tblEnergyUse	NT24NG	1.01	0.00
tblEnergyUse	T24E	4.10	9.83
tblEnergyUse	T24NG	18.32	26.24
tblLandUse	LandUseSquareFeet	170,240.00	170,235.00
tblLandUse	LotAcreage	3.91	3.20
tblLandUse	LotAcreage	5.02	4.20
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.034
tblProjectCharacteristics	CO2IntensityFactor	641.35	210

tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblSequestration	NumberOfNewTrees	0.00	175.00
tblStationaryGeneratorsPumpsEF	CH4_EF	0.07	0.07
tblStationaryGeneratorsPumpsEF	ROG_EF	2.2480e-003	2.2477e-003
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	1,869.00
tblStationaryGeneratorsPumpsUse	HoursPerDay	0.00	1.00
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	50.00
tblStationaryGeneratorsPumpsUse	Load_Factor	0.73	0.80
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	1.00
tblTripsAndVMT	VendorTripNumber	64.00	0.00
tblTripsAndVMT	WorkerTripNumber	148.00	0.00
tblTripsAndVMT	WorkerTripNumber	30.00	0.00
tblVehicleTrips	ST_TR	2.46	0.00
tblVehicleTrips	SU_TR	1.05	0.00
tblVehicleTrips	WD_TR	11.03	0.00
tblWater	IndoorWaterUseRate	30,257,393.26	2,107,306.00
tblWater	OutdoorWaterUseRate	18,544,853.93	1,291,574.00

2.0 Emissions Summary

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.2411	7.00E-04	0.0751	1.00E-05		2.70E-04	2.70E-04		2.70E-04	2.70E-04		0.1594	0.1594	4.30E-04		0.1702
Energy	0.132	1.1998	1.0079	7.20E-03		0.0912	0.0912		0.0912	0.0912		1,439.80	1,439.80	0.0276	0.0264	1,448.35
Mobile	0	0	0	0	0	0	0	0	0	0		0	0	0		0
Stationary	3.3608	15.0314	8.5705	0.0162		0.4945	0.4945		0.4945	0.4945		1,719.51	1,719.51	0.2411		1,725.54
Total	**7.7339**	**16.2319**	**9.6535**	**0.0234**	**0**	**0.5859**	**0.5859**	**0**	**0.5859**	**0.5859**		**3,159.46**	**3,159.46**	**0.2691**	**0.0264**	**3,174.06**

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.132	1.1998	1.0079	7.20E-03		0.0912	0.0912		0.0912	0.0912		1,439.80	1,439.80	0.0276	0.0264	1,448.35

NaturalGas	0.132	1.1998	1.0079	7.20E-03		0.0912	0.0912		0.0912	0.0912		1,439.80	1,439.80	0.0276	0.0264	1,448.35

5.2 Energy by Land Use - NaturalGas
Unmitigated

	NaturalGa	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Office	12238.3	0.132	1.1998	1.0079	7.20E-03		0.0912	0.0912		0.0912	0.0912		1,439.80	1,439.80	0.0276	0.0264	1,448.35
Parking Lot	0	0	0	0	0		0	0		0	0		0	0	0	0	0
Total		**0.132**	**1.1998**	**1.0079**	**7.20E-03**		**0.0912**	**0.0912**		**0.0912**	**0.0912**		**1,439.80**	**1,439.80**	**0.0276**	**0.0264**	**1,448.35**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.2411	7.00E-04	0.0751	1.00E-05		2.70E-04	2.70E-04		2.70E-04	2.70E-04		0.1594	0.1594	4.30E-04		0.1702
Unmitigated	4.2411	7.00E-04	0.0751	1.00E-05		2.70E-04	2.70E-04		2.70E-04	2.70E-04		0.1594	0.1594	4.30E-04		0.1702

6.2 Area by SubCategory
Unmitigated

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural	0.5119					0	0		0	0			0			0.0000
Consumer	3.7221					0	0		0	0			0			0.0000
Landscaping	7.12E-03	7.00E-04	0.0751	1.00E-05		2.70E-04	2.70E-04		2.70E-04	2.70E-04		0.1594	0.1594	4.30E-04		0.1702
Total	**4.2411**	**7.00E-04**	**0.0751**	**1.00E-05**		**2.70E-04**	**2.70E-04**		**2.70E-04**	**2.70E-04**		**0.1594**	**0.1594**	**4.30E-04**		**0.1702**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

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
Emergency Generator	1	1	50	1869	0.8	Diesel

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

10.1 Stationary Sources

Unmitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Equipment Type	lb/day										lb/day					
Emergency Generator - Diesel	3.3608	15.0314	8.5705	0.0162		0.4945	0.4945		0.4945	0.4945		1,719.51	1,719.51	0.2411		1,725.54
Total	**3.3608**	**15.0314**	**8.5705**	**0.0162**		**0.4945**	**0.4945**		**0.4945**	**0.4945**		**1,719.51**	**1,719.51**	**0.2411**		**1,725.54**

11.0 Vegetation

701 Gateway - Existing
San Mateo County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	170.24	1000sqft	3.20	170,235.00	0
Parking Lot	558.00	Space	4.20	223,200.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	70
Climate Zone	5			**Operational Year**	2019

Utility Company Pacific Gas & Electric Company

CO2 Intensity	210	**CH4 Intensity**	0.034	**N2O Intensity**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - EFs adjusted for SB 100
Land Use - sf and spaces provided by applicant; lot acreage scaled by sf
Construction Phase - operational analysis only
Off-road Equipment - operational analysis only
Off-road Equipment - operational analysis only
Off-road Equipment - operational analysis only
Off-road Equipment - operational analysis only
Off-road Equipment - operational analysis only
Off-road Equipment - operational analysis only
Trips and VMT - operational analysis only
Grading -
Architectural Coating - operational analysis only
Vehicle Trips - mobile emissions modeled separately
Energy Use - Energy consumption provided by applicant
Water And Wastewater - water usage provided by project applicant; assumed Caleemod default for general office building of 62% indoor/38% outdoor

Land Use Change -
Sequestration - provided by project applicant
Stationary Sources - Emergency Generators and Fire Pumps - assumed existing generator at 701 Gateway to have same specs as future generator at

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	85,118.00	0.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	255,353.00	0.00
tblArchitecturalCoating	ConstArea_Parking	13,392.00	0.00
tblConstructionPhase	NumDays	20.00	0.00
tblConstructionPhase	NumDays	10.00	0.00
tblConstructionPhase	NumDays	20.00	0.00
tblConstructionPhase	NumDays	230.00	0.00
tblConstructionPhase	NumDays	20.00	0.00
tblConstructionPhase	NumDays	20.00	0.00
tblEnergyUse	LightingElect	3.58	0.00
tblEnergyUse	LightingElect	0.35	0.00
tblEnergyUse	NT24E	4.80	0.00
tblEnergyUse	NT24NG	1.01	0.00
tblEnergyUse	T24E	4.10	9.83
tblEnergyUse	T24NG	18.32	26.24
tblLandUse	LandUseSquareFeet	170,240.00	170,235.00
tblLandUse	LotAcreage	3.91	3.20
tblLandUse	LotAcreage	5.02	4.20
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.034
tblProjectCharacteristics	CO2IntensityFactor	641.35	210

tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblStationaryGeneratorsPumpsEF	CH4_EF	0.07	0.07
tblStationaryGeneratorsPumpsEF	ROG_EF	2.2480e-003	2.2477e-003
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	1,869.00
tblStationaryGeneratorsPumpsUse	HoursPerDay	0.00	1.00
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	50.00
tblStationaryGeneratorsPumpsUse	Load_Factor	0.73	0.80
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	1.00
tblTripsAndVMT	VendorTripNumber	64.00	0.00
tblTripsAndVMT	WorkerTripNumber	148.00	0.00
tblTripsAndVMT	WorkerTripNumber	30.00	0.00
tblVehicleTrips	ST_TR	2.46	0.00
tblVehicleTrips	SU_TR	1.05	0.00
tblVehicleTrips	WD_TR	11.03	0.00
tblWater	IndoorWaterUseRate	30,257,393.26	2,107,306.00
tblWater	OutdoorWaterUseRate	18,544,853.93	1,291,574.00

2.0 Emissions Summary

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.7733	6.00E-05	6.76E-03	0		2.00E-05	2.00E-05		2.00E-05	2.00E-05	0	0.013	0.013	4.00E-05	0	0.0139
Energy	0.0241	0.219	0.1839	1.31E-03		0.0166	0.0166		0.0166	0.0166	0	397.774	397.774	0.0304	7.41E-03	400.7405
Mobile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stationary	0.084	0.3758	0.2143	4.00E-04		0.0124	0.0124		0.0124	0.0124	0	38.9978	38.9978	5.47E-03	0	39.1345
Waste						0	0		0	0	32.1375	0	32.1375	1.8993	0	79.6194
Water						0	0		0	0	0.6686	1.5168	2.1853	0.0689	1.65E-03	4.3999
Total	**0.8815**	**0.5948**	**0.405**	**1.71E-03**	**0**	**0.029**	**0.029**	**0**	**0.029**	**0.029**	**32.8061**	**438.3016**	**471.1077**	**2.0041**	**9.06E-03**	**523.9082**

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity						0	0		0	0	0	159.3997	159.3997	0.0258	3.04E-03	160.9496
Electricity						0	0		0	0	0	159.3997	159.3997	0.0258	3.04E-03	160.9496
NaturalGas	0.0241	0.219	0.1839	1.31E-03		0.0166	0.0166		0.0166	0.0166	0	238.3743	238.3743	4.57E-03	4.37E-03	239.7909
NaturalGas	0.0241	0.219	0.1839	1.31E-03		0.0166	0.0166		0.0166	0.0166	0	238.3743	238.3743	4.57E-03	4.37E-03	239.7909

5.2 Energy by Land Use - NaturalGas
Unmitigated

	NaturalGa	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Office	4.47E+06	0.0241	0.219	0.1839	1.31E-03		0.0166	0.0166		0.0166	0.0166	0	238.3743	238.3743	4.57E-03	4.37E-03	239.7909
Parking Lot	0	0	0	0	0		0	0		0	0	0	0	0	0	0	0
Total		**0.0241**	**0.219**	**0.1839**	**1.31E-03**		**0.0166**	**0.0166**		**0.0166**	**0.0166**	**0**	**238.3743**	**238.3743**	**4.57E-03**	**4.37E-03**	**239.7909**

5.3 Energy by Land Use - Electricity
Unmitigated

	Electricity	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Office	1.67E+06	159.3997	0.0258	3.04E-03	160.9496
Parking Lot	0	0	0	0	0
Total		**159.3997**	**0.0258**	**3.04E-03**	**160.9496**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.7733	6.00E-05	6.76E-03	0		2.00E-05	2.00E-05		2.00E-05	2.00E-05	0	0.013	0.013	4.00E-05	0	0.0139
Unmitigated	0.7733	6.00E-05	6.76E-03	0		2.00E-05	2.00E-05		2.00E-05	2.00E-05	0	0.013	0.013	4.00E-05	0	0.0139

6.2 Area by SubCategory
Unmitigated

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural	0.0934					0	0		0	0	0	0	0	0	0	0
Consumer	0.6793					0	0		0	0	0	0	0	0	0	0

Landscaping	6.40E-04	6.00E-05	6.76E-03	0		2.00E-05	2.00E-05		2.00E-05	2.00E-05	0	0.013	0.013	4.00E-05	0	0.0139
Total	**0.7733**	**6.00E-05**	**6.76E-03**	**0**		**2.00E-05**	**2.00E-05**		**2.00E-05**	**2.00E-05**	**0**	**0.013**	**0.013**	**4.00E-05**	**0**	**0.0139**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	2.1853	0.0689	1.65E-03	4.3999
Unmitigated	2.1853	0.0689	1.65E-03	4.3999

7.2 Water by Land Use

Unmitigated

	Indoor/Out	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Office Building	2.10731 / 1.29157	2.1853	0.0689	1.6500e-003	4.3999
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**2.1853**	**0.0689**	**1.6500e-003**	**4.3999**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	32.1375	1.8993	0.0000	79.6194
Unmitigated	32.1375	1.8993	0.0000	79.6194

8.2 Waste by Land Use

Unmitigated

	Waste	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Office Buildi...	158.32	32.1375	1.8993	0.0000	79.6194
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**32.1375**	**1.8993**	**0.0000**	**79.6194**

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
Emergency Generator	1	1	50	1869	0.8	Diesel

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

10.1 Stationary Sources

Unmitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Emergency	0.084	0.3758	0.2143	4.00E-04		0.0124	0.0124		0.0124	0.0124	0	38.9978	38.9978	5.47E-03	0	39.1345
Total	**0.084**	**0.3758**	**0.2143**	**4.00E-04**		**0.0124**	**0.0124**		**0.0124**	**0.0124**	**0**	**38.9978**	**38.9978**	**5.47E-03**	**0**	**39.1345**

11.0 Vegetation

751 Gateway
San Mateo County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Office Park	78.70	1000sqft	1.06	78,700.00	0
Research & Development	118.00	1000sqft	1.58	118,000.00	0
Parking Lot	431.00	Space	0.16	172,400.00	0
Regional Shopping Center	12.10	1000sqft	2.31	12,100.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	70
Climate Zone	5			**Operational Year**	2021
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity	189	**CH4 Intensity**	0.032	**N2O Intensity**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - EFs adjusted per SB 100
Land Use - square footages provided by applicant; parking spaces includes bicycle parking spaces (10:1); acreage scaled by sf. 5.11 acres assumed for
Construction Phase - Schedule start and end dates provided by applicant; model defaults conservatively used for total days; work days adjusted for
Off-road Equipment - per applicant no equipment
Off-road Equipment - equipment, hp, and work hours provided by applicant
Off-road Equipment - per applicant no equipment
Off-road Equipment - equipment, hp, work hours provided by applicant
Off-road Equipment - equipment accounted for in previous phase
Off-road Equipment - equipment, hp, and work hours provided by applicant
Off-road Equipment - equipment, hp, and work hours provided by applicant
Off-road Equipment - equipment, hp, and work hours provided by applicant
Trips and VMT - workers and vendors per day provided by applicant; total haul trips provided by applicant; hauling trip distance provided by applicant
Demolition - CY provided converted to tons per Caleemod

Grading - conservatively asumed entire site to be graded during site prep; import CY provided by applicant
Architectural Coating -
Vehicle Trips - mobile source emissions modeled separately
Energy Use - energy consumption provided by applicant
Water And Wastewater - water consumption provided by applicant and indoor and outdoor proportioned using Caleemod default %
Land Use Change - no change
Sequestration - tree loss (net loss in trees)
Construction Off-road Equipment Mitigation - Tier 4 final equipment assumed, BAAQMD basic construction mitigation measures
Area Mitigation - extremely compliant VOC g/L
Water Mitigation - per sustainability measures provided by applicant
Stationary Sources - Emergency Generators and Fire Pumps - provided by project applicant

Table Name	Column Name	Default Value	New Value
tblAreaMitigation	UseLowVOCPaintNonresidentialExterio	150	10
tblAreaMitigation	UseLowVOCPaintNonresidentialInterior	100	10
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblAreaMitigation	UseLowVOCPaintParkingValue	150	10
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	19.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
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
tblConstructionPhase	NumDays	20.00	84.00
tblConstructionPhase	NumDays	230.00	217.00
tblConstructionPhase	NumDays	230.00	148.00
tblConstructionPhase	NumDays	20.00	42.00
tblConstructionPhase	NumDays	20.00	105.00
tblConstructionPhase	NumDays	20.00	58.00
tblConstructionPhase	NumDays	10.00	42.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	8/10/2022	10/5/2021
tblConstructionPhase	PhaseEndDate	7/28/2021	9/13/2021
tblConstructionPhase	PhaseEndDate	6/15/2022	10/26/2021

tblConstructionPhase	PhaseEndDate	7/29/2020	8/29/2020
tblConstructionPhase	PhaseEndDate	9/9/2020	1/2/2021
tblConstructionPhase	PhaseEndDate	7/13/2022	12/2/2021
tblConstructionPhase	PhaseEndDate	8/12/2020	8/29/2020
tblConstructionPhase	PhaseStartDate	7/14/2022	6/10/2021
tblConstructionPhase	PhaseStartDate	9/10/2020	1/3/2021
tblConstructionPhase	PhaseStartDate	7/29/2021	4/2/2021
tblConstructionPhase	PhaseStartDate	8/13/2020	8/9/2020
tblConstructionPhase	PhaseStartDate	6/16/2022	9/14/2021
tblConstructionPhase	PhaseStartDate	7/30/2020	7/2/2020
tblEnergyUse	LightingElect	3.47	0.00
tblEnergyUse	LightingElect	0.35	0.00
tblEnergyUse	LightingElect	4.88	0.00
tblEnergyUse	LightingElect	2.99	0.00
tblEnergyUse	NT24E	4.81	0.00
tblEnergyUse	NT24E	3.36	0.00
tblEnergyUse	NT24E	3.36	0.00
tblEnergyUse	NT24NG	1.17	0.00
tblEnergyUse	NT24NG	0.70	0.00
tblEnergyUse	NT24NG	6.90	0.00
tblEnergyUse	T24E	4.27	68.95
tblEnergyUse	T24E	2.24	0.00
tblEnergyUse	T24E	1.21	0.00
tblEnergyUse	T24NG	17.44	43.86
tblEnergyUse	T24NG	3.90	0.00
tblEnergyUse	T24NG	17.85	0.00
tblGrading	AcresOfGrading	0.00	7.40
tblGrading	MaterialImported	0.00	750.00
tblLandUse	LotAcreage	1.81	1.06
tblLandUse	LotAcreage	2.71	1.58
tblLandUse	LotAcreage	3.88	0.16
tblLandUse	LotAcreage	0.28	2.31
tblOffRoadEquipment	HorsePower	231.00	400.00
tblOffRoadEquipment	HorsePower	158.00	300.00
tblOffRoadEquipment	HorsePower	158.00	300.00
tblOffRoadEquipment	HorsePower	46.00	15.00
tblOffRoadEquipment	HorsePower	63.00	50.00
tblOffRoadEquipment	HorsePower	231.00	200.00
tblOffRoadEquipment	HorsePower	85.00	200.00
tblOffRoadEquipment	HorsePower	158.00	200.00
tblOffRoadEquipment	HorsePower	402.00	300.00
tblOffRoadEquipment	HorsePower	402.00	400.00
tblOffRoadEquipment	HorsePower	84.00	300.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Site Prep/ Demolition
tblOffRoadEquipment	PhaseName		Site Prep/ Demolition
tblOffRoadEquipment	UsageHours	7.00	8.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.032
tblProjectCharacteristics	CO2IntensityFactor	641.35	189
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblSequestration	NumberOfNewTrees	0.00	98.00
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	1,869.00
tblStationaryGeneratorsPumpsUse	HoursPerDay	0.00	1.00
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	50.00
tblStationaryGeneratorsPumpsUse	Load_Factor	0.73	0.80
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	40.00
tblTripsAndVMT	HaulingTripNumber	15.00	0.00
tblTripsAndVMT	HaulingTripNumber	94.00	0.00
tblTripsAndVMT	HaulingTripNumber	0.00	500.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00
tblTripsAndVMT	VendorTripNumber	0.00	13.00

tblTripsAndVMT	VendorTripNumber	62.00	8.00
tblTripsAndVMT	VendorTripNumber	62.00	9.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00
tblTripsAndVMT	VendorTripNumber	0.00	9.00
tblTripsAndVMT	WorkerTripNumber	8.00	40.00
tblTripsAndVMT	WorkerTripNumber	63.00	70.00
tblTripsAndVMT	WorkerTripNumber	139.00	140.00
tblTripsAndVMT	WorkerTripNumber	139.00	70.00
tblTripsAndVMT	WorkerTripNumber	0.00	180.00
tblTripsAndVMT	WorkerTripNumber	28.00	10.00
tblVehicleTrips	ST_TR	1.64	0.00
tblVehicleTrips	ST_TR	49.97	0.00
tblVehicleTrips	ST_TR	1.90	0.00
tblVehicleTrips	SU_TR	0.76	0.00
tblVehicleTrips	SU_TR	25.24	0.00
tblVehicleTrips	SU_TR	1.11	0.00
tblVehicleTrips	WD_TR	11.42	0.00
tblVehicleTrips	WD_TR	42.70	0.00
tblVehicleTrips	WD_TR	8.11	0.00
tblWater	IndoorWaterUseRate	13,987,645.97	974,222.00
tblWater	IndoorWaterUseRate	896,277.51	301,205.00
tblWater	IndoorWaterUseRate	58,019,885.77	3,531,740.00
tblWater	OutdoorWaterUseRate	8,573,073.33	597,104.00
tblWater	OutdoorWaterUseRate	549,331.38	184,610.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	7.3817	67.7933	41.0426	0.1893	1.4636	2.0624	3.526	0.3542	2.0017	2.3559	0	20,157.68	20,157.68	2.2821	0	20,214.74
2021	29.3771	46.0616	31.2318	0.1481	13.9233	1.3888	15.3121	3.4373	1.3564	4.7937	0	16,170.05	16,170.05	1.5544	0	16,208.91
Maximum	**29.3771**	**67.7933**	**41.0426**	**0.1893**	**13.9233**	**2.0624**	**15.3121**	**3.4373**	**2.0017**	**4.7937**	**0**	**20,157.68**	**20,157.68**	**2.2821**	**0**	**20,214.74**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	2.4533	13.6131	77.7353	0.1893	1.3177	0.2926	1.6103	0.3365	0.2913	0.6278	0	20,157.68	20,157.68	2.2821	0	20,214.74
2021	27.7543	10.7241	61.66	0.1481	13.9233	0.2275	14.1508	3.4373	0.2268	3.6641	0	16,170.05	16,170.05	1.5544	0	16,208.91
Maximum	**27.7543**	**13.6131**	**77.7353**	**0.1893**	**13.9233**	**0.2926**	**14.1508**	**3.4373**	**0.2913**	**3.6641**	**0**	**20,157.68**	**20,157.68**	**2.2821**	**0**	**20,214.74**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive**	**Exhaust**	**PM10**	**Fugitive**	**Exhaust**	**PM2.5**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**17.82**	**78.62**	**-92.87**	**0.00**	**0.95**	**84.93**	**16.33**	**0.46**	**84.57**	**39.97**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	5.1518	6.00E-04	0.0656	0		2.30E-04	2.30E-04		2.30E-04	2.30E-04		0.14	0.14	3.70E-04		0.1493
Energy	0.102	0.9272	0.7788	5.56E-03		0.0705	0.0705		0.0705	0.0705		1,112.58	1,112.58	0.0213	0.0204	1,119.19
Mobile	0	0	0	0	0	0	0	0	0	0		0	0	0		0
Stationary	3.3613	15.0314	8.5705	0.0162		0.4945	0.4945		0.4945	0.4945		1,719.51	1,719.51	0.2411		1,725.54
Total	**8.6151**	**15.9591**	**9.4149**	**0.0217**	**0**	**0.5651**	**0.5651**	**0**	**0.5651**	**0.5651**		**2,832.23**	**2,832.23**	**0.2628**	**0.0204**	**2,844.88**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	5.1518	6.00E-04	0.0656	0		2.30E-04	2.30E-04		2.30E-04	2.30E-04		0.14	0.14	3.70E-04		0.1493
Energy	0.102	0.9272	0.7788	5.56E-03		0.0705	0.0705		0.0705	0.0705		1,112.58	1,112.58	0.0213	0.0204	1,119.19
Mobile	0	0	0	0	0	0	0	0	0	0		0	0	0		0
Stationary	3.3613	15.0314	8.5705	0.0162		0.4945	0.4945		0.4945	0.4945		1,719.51	1,719.51	0.2411		1,725.54
Total	**8.6151**	**15.9591**	**9.4149**	**0.0217**	**0**	**0.5651**	**0.5651**	**0**	**0.5651**	**0.5651**		**2,832.23**	**2,832.23**	**0.2628**	**0.0204**	**2,844.88**

	ROG	**NOx**	**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	**6.52**	**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	Phase Name	Phase Type	Start Date	End Date	Num Days	Num Days	Phase Description
1	Site Prep/ Demolition	Demolition	7/2/2020	8/29/2020	5	42	
2	Site Prep/Demolition	Site Preparation	7/2/2020	8/29/2020	5	42	
3	Foundations	Grading	8/9/2020	1/2/2021	5	105	
4	Structure	Building Construction	1/3/2021	9/13/2021	6	217	
5	Interior Buildout	Building Construction	4/2/2021	10/26/2021	5	148	
6	Skin and Roof	Architectural Coating	6/10/2021	10/5/2021	5	84	
7	Commissioning and Final	Paving	9/14/2021	12/2/2021	5	58	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0.16

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 313,200; Non-Residential Outdoor: 104,400; Striped Parking Area:

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Prep/ Demolition	Concrete/Industrial Saws	0	8.00	81	0.73
Site Prep/ Demolition	Crushing/Proc. Equipment	1	8.00	200	0.78
Site Prep/ Demolition	Excavators	0	8.00	158	0.38
Site Prep/ Demolition	Excavators	1	8.00	300	0.38
Site Prep/ Demolition	Off-Highway Trucks	1	8.00	300	0.38
Site Prep/ Demolition	Rubber Tired Dozers	0	8.00	247	0.40
Site Prep/Demolition	Rubber Tired Dozers	0	8.00	247	0.40
Site Prep/Demolition	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Foundations	Excavators	2	8.00	300	0.38
Foundations	Graders	0	8.00	187	0.41
Foundations	Off-Highway Trucks	18	0.50	400	0.38
Foundations	Pumps	5	8.00	300	0.74
Foundations	Rubber Tired Dozers	0	8.00	247	0.40
Foundations	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Structure	Aerial Lifts	2	8.00	50	0.31
Structure	Cranes	1	8.00	400	0.29
Structure	Excavators	1	8.00	200	0.38
Structure	Forklifts	0	8.00	89	0.20
Structure	Generator Sets	0	8.00	84	0.74
Structure	Tractors/Loaders/Backhoes	0	7.00	97	0.37

Structure	Welders	8	8.00	15	0.45
Interior Buildout	Cranes	0	7.00	231	0.29
Interior Buildout	Forklifts	0	8.00	89	0.20
Interior Buildout	Generator Sets	0	8.00	84	0.74
Interior Buildout	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Interior Buildout	Welders	0	8.00	46	0.45
Skin and Roof	Air Compressors	0	6.00	78	0.48
Skin and Roof	Cranes	1	8.00	200	0.29
Commissioning and Final Inspections	Pavers	0	8.00	130	0.42
Commissioning and Final Inspections	Paving Equipment	0	8.00	132	0.36
Commissioning and Final Inspections	Rollers	0	8.00	80	0.38

Trips and VMT

Phase Name	Offroad Equipment	Worker Trip	Vendor Trip	Hauling Trip	Worker Trip	Vendor Trip	Hauling Trip	Worker Vehicle	Vendor	Hauling
Site Prep/ Demolition	3	40.00	6.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Prep/Demolition	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Foundations	25	70.00	13.00	500.00	10.80	7.30	40.00	LD_Mix	HDT_Mix	HHDT
Structure	12	140.00	8.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Interior Buildout	0	70.00	9.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Skin and Roof	1	10.00	9.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Commissioning and	0	180.00	6.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment
Water Exposed Area
Reduce Vehicle Speed on Unpaved Roads

3.2 Site Prep/ Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0764	0.0000	0.0764	0.0116	0.0000	0.0116			0.0000			0.0000
Off-Road	1.5984	13.4204	8.1536	0.0361		0.4549	0.4549		0.4328	0.4328		3,463.379	3,463.3795	0.6860		3,480.528
Total	**1.5984**	**13.4204**	**8.1536**	**0.0361**	**0.0764**	**0.4549**	**0.5313**	**0.0116**	**0.4328**	**0.4444**		**3,463.379**	**3,463.3795**	**0.6860**		**3,480.528**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0	0	0	0	0	0	0	0	0	0		0	0	0		0
Vendor	0.0228	0.6853	0.2657	1.61E-03	0.0405	3.43E-03	0.0439	0.0117	3.28E-03	0.0149		176.558	176.558	0.0151		176.9347
Worker	0.1099	0.0652	0.8278	3.08E-03	0.3286	1.98E-03	0.3306	0.0872	1.82E-03	0.089		306.8476	306.8476	5.93E-03		306.9959
Total	**0.1327**	**0.7504**	**1.0934**	**4.69E-03**	**0.3691**	**5.41E-03**	**0.3745**	**0.0988**	**5.10E-03**	**0.1039**		**483.4056**	**483.4056**	**0.021**		**483.9306**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0344	0	0.0344	5.21E-03	0	5.21E-03			0			0
Off-Road	0.4064	1.7609	14.8997	0.0361		0.0542	0.0542		0.0542	0.0542	0	3,463.38	3,463.38	0.686		3,480.53
Total	**0.4064**	**1.7609**	**14.8997**	**0.0361**	**0.0344**	**0.0542**	**0.0886**	**5.21E-03**	**0.0542**	**0.0594**	**0**	**3,463.38**	**3,463.38**	**0.686**		**3,480.53**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0	0	0	0	0	0	0	0	0	0		0	0	0		0
Vendor	0.0228	0.6853	0.2657	1.61E-03	0.0405	3.43E-03	0.0439	0.0117	3.28E-03	0.0149		176.558	176.558	0.0151		176.9347
Worker	0.1099	0.0652	0.8278	3.08E-03	0.3286	1.98E-03	0.3306	0.0872	1.82E-03	0.089		306.8476	306.8476	5.93E-03		306.9959
Total	**0.1327**	**0.7504**	**1.0934**	**4.69E-03**	**0.3691**	**5.41E-03**	**0.3745**	**0.0988**	**5.10E-03**	**0.1039**		**483.4056**	**483.4056**	**0.021**		**483.9306**

3.3 Site Prep/Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1889	0.0000	0.1889	0.0205	0.0000	0.0205			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
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.1889**	**0.0000**	**0.1889**	**0.0205**	**0.0000**	**0.0205**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
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
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
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
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 Construction On-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.085	0	0.085	9.22E-03	0	9.22E-03			0			0
Off-Road	0	0	0	0		0	0		0	0	0	0	0	0		0
Total	**0**	**0**	**0**	**0**	**0.085**	**0**	**0.085**	**9.22E-03**	**0**	**9.22E-03**	**0**	**0**	**0**	**0**		**0**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0	0	0	0	0	0	0	0	0	0		0	0	0		0
Vendor	0	0	0	0	0	0	0	0	0	0		0	0	0		0
Worker	0	0	0	0	0	0	0	0	0	0		0	0	0		0
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		**0**	**0**	**0**		**0**

3.4 Foundations - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0	0	0	0	0	0			0			0
Off-Road	5.3332	49.4404	28.6047	0.1322		1.582	1.582		1.5447	1.5447		14,448.10	14,448.10	1.4269		14,483.77
Total	**5.3332**	**49.4404**	**28.6047**	**0.1322**	**0**	**1.582**	**1.582**	**0**	**1.5447**	**1.5447**		**14,448.10**	**14,448.10**	**1.4269**		**14,483.77**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0757	2.5833	1.1667	7.44E-03	0.1665	9.15E-03	0.1756	0.0455	8.76E-03	0.0543		843.2762	843.2762	0.1051		845.9048
Vendor	0.0494	1.4847	0.5756	3.48E-03	0.0877	7.44E-03	0.0952	0.0253	7.12E-03	0.0324		382.5423	382.5423	0.0327		383.3585
Worker	0.1923	0.1141	1.4486	5.38E-03	0.575	3.46E-03	0.5785	0.1525	3.19E-03	0.1557		536.9832	536.9832	0.0104		537.2427
Total	**0.3174**	**4.1821**	**3.1909**	**0.0163**	**0.8292**	**0.0201**	**0.8493**	**0.2233**	**0.0191**	**0.2424**		**1,762.80**	**1,762.80**	**0.1482**		**1,766.51**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0	0	0	0	0	0			0			0
Off-Road	1.5969	6.9197	58.5513	0.1322		0.2129	0.2129		0.2129	0.2129	0	14,448.10	14,448.10	1.4269		14,483.77
Total	**1.5969**	**6.9197**	**58.5513**	**0.1322**	**0**	**0.2129**	**0.2129**	**0**	**0.2129**	**0.2129**	**0**	**14,448.10**	**14,448.10**	**1.4269**		**14,483.77**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0757	2.5833	1.1667	7.44E-03	0.1665	9.15E-03	0.1756	0.0455	8.76E-03	0.0543		843.2762	843.2762	0.1051		845.9048
Vendor	0.0494	1.4847	0.5756	3.48E-03	0.0877	7.44E-03	0.0952	0.0253	7.12E-03	0.0324		382.5423	382.5423	0.0327		383.3585
Worker	0.1923	0.1141	1.4486	5.38E-03	0.575	3.46E-03	0.5785	0.1525	3.19E-03	0.1557		536.9832	536.9832	0.0104		537.2427
Total	**0.3174**	**4.1821**	**3.1909**	**0.0163**	**0.8292**	**0.0201**	**0.8493**	**0.2233**	**0.0191**	**0.2424**		**1,762.80**	**1,762.80**	**0.1482**		**1,766.51**

3.4 Foundations - 2021
Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0	0	0	0	0	0			0			0
Off-Road	4.9532	42.2571	28.123	0.1322		1.3742	1.3742		1.3426	1.3426		14,445.23	14,445.23	1.4064		14,480.39
Total	**4.9532**	**42.2571**	**28.123**	**0.1322**	**0**	**1.3742**	**1.3742**	**0**	**1.3426**	**1.3426**		**14,445.23**	**14,445.23**	**1.4064**		**14,480.39**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0723	2.367	1.2097	7.29E-03	13.2605	8.23E-03	13.2687	3.2595	7.87E-03	3.2674		829.1937	829.1937	0.1065		831.8562
Vendor	0.0406	1.3351	0.5577	3.43E-03	0.0878	3.04E-03	0.0908	0.0253	2.91E-03	0.0282		377.7811	377.7811	0.0321		378.5836
Worker	0.1795	0.1024	1.3414	5.19E-03	0.575	3.36E-03	0.5784	0.1525	3.09E-03	0.1556		517.8393	517.8393	9.34E-03		518.0727
Total	**0.2923**	**3.8044**	**3.1088**	**0.0159**	**13.9233**	**0.0146**	**13.9379**	**3.4373**	**0.0139**	**3.4512**		**1,724.81**	**1,724.81**	**0.1479**		**1,728.51**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0	0	0	0	0	0			0			0
Off-Road	1.5969	6.9197	58.5513	0.1322		0.2129	0.2129		0.2129	0.2129	0	14,445.23	14,445.23	1.4064		14,480.39
Total	**1.5969**	**6.9197**	**58.5513**	**0.1322**	**0**	**0.2129**	**0.2129**	**0**	**0.2129**	**0.2129**	**0**	**14,445.23**	**14,445.23**	**1.4064**		**14,480.39**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0723	2.367	1.2097	7.29E-03	13.2605	8.23E-03	13.2687	3.2595	7.87E-03	3.2674		829.1937	829.1937	0.1065		831.8562
Vendor	0.0406	1.3351	0.5577	3.43E-03	0.0878	3.04E-03	0.0908	0.0253	2.91E-03	0.0282		377.7811	377.7811	0.0321		378.5836
Worker	0.1795	0.1024	1.3414	5.19E-03	0.575	3.36E-03	0.5784	0.1525	3.09E-03	0.1556		517.8393	517.8393	9.34E-03		518.0727

Total	0.2923	3.8044	3.1088	0.0159	13.9233	0.0146	13.9379	3.4373	0.0139	3.4512		1,724.81	1,724.81	0.1479		1,728.51

3.5 Structure - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5955	15.1768	11.5531	0.0271		0.5717	0.5717		0.5423	0.5423		2,427.32	2,427.32	0.671		2,444.09
Total	**1.5955**	**15.1768**	**11.5531**	**0.0271**		**0.5717**	**0.5717**		**0.5423**	**0.5423**		**2,427.32**	**2,427.32**	**0.671**		**2,444.09**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0	0	0	0	0	0	0	0	0	0		0	0	0		0
Vendor	0.025	0.8216	0.3432	2.11E-03	0.054	1.87E-03	0.0559	0.0155	1.79E-03	0.0173		232.4807	232.4807	0.0198		232.9745
Worker	0.3589	0.2047	2.6828	0.0104	1.1501	6.71E-03	1.1568	0.3051	6.18E-03	0.3112		1,035.68	1,035.68	0.0187		1,036.15
Total	**0.3839**	**1.0263**	**3.026**	**0.0125**	**1.2041**	**8.58E-03**	**1.2127**	**0.3206**	**7.97E-03**	**0.3286**		**1,268.16**	**1,268.16**	**0.0384**		**1,269.12**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2688	2.3785	9.4728	0.0271		0.0315	0.0315		0.0315	0.0315	0	2,427.32	2,427.32	0.671		2,444.09
Total	**0.2688**	**2.3785**	**9.4728**	**0.0271**		**0.0315**	**0.0315**		**0.0315**	**0.0315**	**0**	**2,427.32**	**2,427.32**	**0.671**		**2,444.09**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0	0	0	0	0	0	0	0	0	0		0	0	0		0
Vendor	0.025	0.8216	0.3432	2.11E-03	0.054	1.87E-03	0.0559	0.0155	1.79E-03	0.0173		232.4807	232.4807	0.0198		232.9745
Worker	0.3589	0.2047	2.6828	0.0104	1.1501	6.71E-03	1.1568	0.3051	6.18E-03	0.3112		1,035.68	1,035.68	0.0187		1,036.15
Total	**0.3839**	**1.0263**	**3.026**	**0.0125**	**1.2041**	**8.58E-03**	**1.2127**	**0.3206**	**7.97E-03**	**0.3286**		**1,268.16**	**1,268.16**	**0.0384**		**1,269.12**

3.6 Interior Buildout - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
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
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**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0	0	0	0	0	0	0	0	0	0		0	0	0		0
Vendor	0.0281	0.9243	0.3861	2.37E-03	0.0608	2.10E-03	0.0629	0.0175	2.01E-03	0.0195		261.5408	261.5408	0.0222		262.0963
Worker	0.1795	0.1024	1.3414	5.19E-03	0.575	3.36E-03	0.5784	0.1525	3.09E-03	0.1556		517.8393	517.8393	9.34E-03		518.0727
Total	**0.2075**	**1.0266**	**1.7275**	**7.56E-03**	**0.6358**	**5.46E-03**	**0.6412**	**0.17**	**5.10E-03**	**0.1751**		**779.3801**	**779.3801**	**0.0316**		**780.1691**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
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
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**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0	0	0	0	0	0	0	0	0	0		0	0	0		0
Vendor	0.0281	0.9243	0.3861	2.37E-03	0.0608	2.10E-03	0.0629	0.0175	2.01E-03	0.0195		261.5408	261.5408	0.0222		262.0963
Worker	0.1795	0.1024	1.3414	5.19E-03	0.575	3.36E-03	0.5784	0.1525	3.09E-03	0.1556		517.8393	517.8393	9.34E-03		518.0727
Total	**0.2075**	**1.0266**	**1.7275**	**7.56E-03**	**0.6358**	**5.46E-03**	**0.6412**	**0.17**	**5.10E-03**	**0.1751**		**779.3801**	**779.3801**	**0.0316**		**780.1691**

3.7 Skin and Roof - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	26.7790					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3575	4.1986	1.7168	4.9900e-		0.1705	0.1705		0.1568	0.1568		483.7565	483.7565	0.1565		487.6679
Total	**27.1365**	**4.1986**	**1.7168**	**4.9900e-**		**0.1705**	**0.1705**		**0.1568**	**0.1568**		**483.7565**	**483.7565**	**0.1565**		**487.6679**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0	0	0	0	0	0	0	0	0	0		0	0	0		0
Vendor	0.0281	0.9243	0.3861	2.37E-03	0.0608	2.10E-03	0.0629	0.0175	2.01E-03	0.0195		261.5408	261.5408	0.0222		262.0963
Worker	0.0256	0.0146	0.1916	7.40E-04	0.0822	4.80E-04	0.0826	0.0218	4.40E-04	0.0222		73.977	73.977	1.33E-03		74.0104
Total	**0.0537**	**0.9389**	**0.5778**	**3.11E-03**	**0.1429**	**2.58E-03**	**0.1455**	**0.0393**	**2.45E-03**	**0.0417**		**335.5178**	**335.5178**	**0.0236**		**336.1067**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	26.779					0	0		0	0			0			0
Off-Road	0.0614	0.266	2.2505	4.99E-03		8.18E-03	8.18E-03		8.18E-03	8.18E-03	0	483.7565	483.7565	0.1565		487.6679
Total	**26.8404**	**0.266**	**2.2505**	**4.99E-03**		**8.18E-03**	**8.18E-03**		**8.18E-03**	**8.18E-03**	**0**	**483.7565**	**483.7565**	**0.1565**		**487.6679**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0	0	0	0	0	0	0	0	0	0		0	0	0		0
Vendor	0.0281	0.9243	0.3861	2.37E-03	0.0608	2.10E-03	0.0629	0.0175	2.01E-03	0.0195		261.5408	261.5408	0.0222		262.0963
Worker	0.0256	0.0146	0.1916	7.40E-04	0.0822	4.80E-04	0.0826	0.0218	4.40E-04	0.0222		73.977	73.977	1.33E-03		74.0104
Total	**0.0537**	**0.9389**	**0.5778**	**3.11E-03**	**0.1429**	**2.58E-03**	**0.1455**	**0.0393**	**2.45E-03**	**0.0417**		**335.5178**	**335.5178**	**0.0236**		**336.1067**

3.8 Commissioning and Final Inspections - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0	0	0	0		0	0		0	0		0	0	0		0
Paving	7.23E-03					0	0		0	0			0			0
Total	**7.23E-03**	**0**	**0**	**0**		**0**	**0**		**0**	**0**		**0**	**0**	**0**		**0**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0	0	0	0	0	0	0	0	0	0		0	0	0		0
Vendor	0.0187	0.6162	0.2574	1.58E-03	0.0405	1.40E-03	0.0419	0.0117	1.34E-03	0.013		174.3605	174.3605	0.0148		174.7309
Worker	0.4615	0.2632	3.4493	0.0134	1.4787	8.63E-03	1.4873	0.3922	7.94E-03	0.4002		1,331.59	1,331.59	0.024		1,332.19
Total	**0.4802**	**0.8794**	**3.7067**	**0.0149**	**1.5192**	**0.01**	**1.5292**	**0.4039**	**9.28E-03**	**0.4131**		**1,505.95**	**1,505.95**	**0.0388**		**1,506.92**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Off-Road	0	0	0	0		0	0		0	0	0	0	0	0		0
Paving	7.23E-03					0	0		0	0			0			0
Total	**7.23E-03**	**0**	**0**	**0**		**0**	**0**		**0**	**0**	**0**	**0**	**0**	**0**		**0**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0	0	0	0	0	0	0	0	0	0		0	0	0		0
Vendor	0.0187	0.6162	0.2574	1.58E-03	0.0405	1.40E-03	0.0419	0.0117	1.34E-03	0.013		174.3605	174.3605	0.0148		174.7309
Worker	0.4615	0.2632	3.4493	0.0134	1.4787	8.63E-03	1.4873	0.3922	7.94E-03	0.4002		1,331.59	1,331.59	0.024		1,332.19
Total	**0.4802**	**0.8794**	**3.7067**	**0.0149**	**1.5192**	**0.01**	**1.5292**	**0.4039**	**9.28E-03**	**0.4131**		**1,505.95**	**1,505.95**	**0.0388**		**1,506.92**

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas	0.102	0.9272	0.7788	5.56E-03		0.0705	0.0705		0.0705	0.0705		1,112.58	1,112.58	0.0213	0.0204	1,119.19
NaturalGas	0.102	0.9272	0.7788	5.56E-03		0.0705	0.0705		0.0705	0.0705		1,112.58	1,112.58	0.0213	0.0204	1,119.19

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGa	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Office Park	9456.94	0.102	0.9272	0.7788	5.56E-03		0.0705	0.0705		0.0705	0.0705		1,112.58	1,112.58	0.0213	0.0204	1,119.19
Parking Lot	0	0	0	0	0		0	0		0	0		0	0	0	0	0
Regional	0	0	0	0	0		0	0		0	0		0	0	0	0	0
Research &	0	0	0	0	0		0	0		0	0		0	0	0	0	0
Total		**0.102**	**0.9272**	**0.7788**	**5.56E-03**		**0.0705**	**0.0705**		**0.0705**	**0.0705**		**1,112.58**	**1,112.58**	**0.0213**	**0.0204**	**1,119.19**

Mitigated

	NaturalGa	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					

Office Park	9.45694	0.102	0.9272	0.7788	5.56E-03		0.0705	0.0705		0.0705	0.0705		1,112.58	1,112.58	0.0213	0.0204	1,119.19
Parking Lot	0	0	0	0	0		0	0		0	0		0	0	0	0	0
Regional	0	0	0	0	0		0	0		0	0		0	0	0	0	0
Research &	0	0	0	0	0		0	0		0	0		0	0	0	0	0
Total		**0.102**	**0.9272**	**0.7788**	**5.56E-03**		**0.0705**	**0.0705**		**0.0705**	**0.0705**		**1,112.58**	**1,112.58**	**0.0213**	**0.0204**	**1,119.19**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.5899	6.00E-04	0.0656	0		2.30E-04	2.30E-04		2.30E-04	2.30E-04		0.14	0.14	3.70E-04		0.1493
Unmitigated	5.1518	6.00E-04	0.0656	0		2.30E-04	2.30E-04		2.30E-04	2.30E-04		0.14	0.14	3.70E-04		0.1493

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural	0.6163					0	0		0	0			0			0
Consumer	4.5294					0	0		0	0			0			0
Landscaping	6.13E-03	6.00E-04	0.0656	0		2.30E-04	2.30E-04		2.30E-04	2.30E-04		0.14	0.14	3.70E-04		0.1493
Total	**5.1518**	**6.00E-04**	**0.0656**	**0**		**2.30E-04**	**2.30E-04**		**2.30E-04**	**2.30E-04**		**0.14**	**0.14**	**3.70E-04**		**0.1493**

Mitigated

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural	0.6163					0	0		0	0			0			0
Consumer	4.5294					0	0		0	0			0			0
Landscaping	6.13E-03	6.00E-04	0.0656	0		2.30E-04	2.30E-04		2.30E-04	2.30E-04		0.14	0.14	3.70E-04		0.1493
Total	**5.1518**	**6.00E-04**	**0.0656**	**0**		**2.30E-04**	**2.30E-04**		**2.30E-04**	**2.30E-04**		**0.14**	**0.14**	**3.70E-04**		**0.1493**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet
Install Low Flow Kitchen Faucet

Install Low Flow Toilet
Install Low Flow Shower
Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

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
Emergency Generator	1	1	50	1869	0.8	Diesel

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

10.1 Stationary Sources

Unmitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Equipment Type	lb/day										lb/day					
Emergency	3.3613	15.0314	8.5705	0.0162		0.4945	0.4945		0.4945	0.4945		1,719.51	1,719.51	0.2411		1,725.54
Total	**3.3613**	**15.0314**	**8.5705**	**0.0162**		**0.4945**	**0.4945**		**0.4945**	**0.4945**		**1,719.51**	**1,719.51**	**0.2411**		**1,725.54**

11.0 Vegetation

751 Gateway
San Mateo County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Office Park	78.70	1000sqft	1.06	78,700.00	0
Research & Development	118.00	1000sqft	1.58	118,000.00	0
Parking Lot	431.00	Space	0.16	172,400.00	0
Regional Shopping Center	12.10	1000sqft	2.31	12,100.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	70
Climate Zone	5			**Operational Year**	2021
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity	189	**CH4 Intensity**	0.032	**N2O Intensity**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - EFs adjusted per SB 100
Land Use - square footages provided by applicant; parking spaces includes bicycle parking spaces (10:1); acreage scaled by sf. 5.11 acres assumed for site exclusing 701
Construction Phase - Schedule start and end dates provided by applicant; model defaults conservatively used for total days; work days adjusted for Structure to
Off-road Equipment - per applicant no equipment
Off-road Equipment - equipment, hp, and work hours provided by applicant
Off-road Equipment - per applicant no equipment
Off-road Equipment - equipment, hp, work hours provided by applicant
Off-road Equipment - equipment accounted for in previous phase
Off-road Equipment - equipment, hp, and work hours provided by applicant
Off-road Equipment - equipment, hp, and work hours provided by applicant
Off-road Equipment - equipment, hp, and work hours provided by applicant
Trips and VMT - workers and vendors per day provided by applicant; total haul trips provided by applicant; hauling trip distance provided by applicant
Demolition - CY provided converted to tons per Caleemod
Grading - conservatively asumed entire site to be graded during site prep; import CY provided by applicant
Architectural Coating -

Vehicle Trips - mobile source emissions modeled separately
Energy Use - energy consumption provided by applicant
Water And Wastewater - water consumption provided by applicant and indoor and outdoor proportioned using Caleemod default %
Land Use Change - no change
Construction Off-road Equipment Mitigation - Tier 4 final equipment assumed, BAAQMD basic construction mitigation measures
Area Mitigation - extremely compliant VOC g/L
Water Mitigation - per sustainability measures provided by applicant
Stationary Sources - Emergency Generators and Fire Pumps - provided by project applicant

Table Name	Column Name	Default Value	New Value
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	150	10
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	100	10
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblAreaMitigation	UseLowVOCPaintParkingValue	150	10
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	19.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
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
tblConstructionPhase	NumDays	20.00	84.00
tblConstructionPhase	NumDays	230.00	217.00
tblConstructionPhase	NumDays	230.00	148.00
tblConstructionPhase	NumDays	20.00	42.00
tblConstructionPhase	NumDays	20.00	105.00
tblConstructionPhase	NumDays	20.00	58.00
tblConstructionPhase	NumDays	10.00	42.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	8/10/2022	10/5/2021
tblConstructionPhase	PhaseEndDate	7/28/2021	9/13/2021
tblConstructionPhase	PhaseEndDate	6/15/2022	10/26/2021
tblConstructionPhase	PhaseEndDate	7/29/2020	8/29/2020
tblConstructionPhase	PhaseEndDate	9/9/2020	1/2/2021
tblConstructionPhase	PhaseEndDate	7/13/2022	12/2/2021
tblConstructionPhase	PhaseEndDate	8/12/2020	8/29/2020
tblConstructionPhase	PhaseStartDate	7/14/2022	6/10/2021

tblConstructionPhase	PhaseStartDate	9/10/2020	1/3/2021
tblConstructionPhase	PhaseStartDate	7/29/2021	4/2/2021
tblConstructionPhase	PhaseStartDate	8/13/2020	8/9/2020
tblConstructionPhase	PhaseStartDate	6/16/2022	9/14/2021
tblConstructionPhase	PhaseStartDate	7/30/2020	7/2/2020
tblEnergyUse	LightingElect	3.47	0.00
tblEnergyUse	LightingElect	0.35	0.00
tblEnergyUse	LightingElect	4.88	0.00
tblEnergyUse	LightingElect	2.99	0.00
tblEnergyUse	NT24E	4.81	0.00
tblEnergyUse	NT24E	3.36	0.00
tblEnergyUse	NT24E	3.36	0.00
tblEnergyUse	NT24NG	1.17	0.00
tblEnergyUse	NT24NG	0.70	0.00
tblEnergyUse	NT24NG	6.90	0.00
tblEnergyUse	T24E	4.27	68.95
tblEnergyUse	T24E	2.24	0.00
tblEnergyUse	T24E	1.21	0.00
tblEnergyUse	T24NG	17.44	43.86
tblEnergyUse	T24NG	3.90	0.00
tblEnergyUse	T24NG	17.85	0.00
tblGrading	AcresOfGrading	0.00	7.40
tblGrading	MaterialImported	0.00	750.00
tblLandUse	LotAcreage	1.81	1.06
tblLandUse	LotAcreage	2.71	1.58
tblLandUse	LotAcreage	3.88	0.16
tblLandUse	LotAcreage	0.28	2.31
tblOffRoadEquipment	HorsePower	231.00	400.00
tblOffRoadEquipment	HorsePower	158.00	300.00
tblOffRoadEquipment	HorsePower	158.00	300.00
tblOffRoadEquipment	HorsePower	46.00	15.00
tblOffRoadEquipment	HorsePower	63.00	50.00
tblOffRoadEquipment	HorsePower	231.00	200.00
tblOffRoadEquipment	HorsePower	85.00	200.00
tblOffRoadEquipment	HorsePower	158.00	200.00
tblOffRoadEquipment	HorsePower	402.00	300.00
tblOffRoadEquipment	HorsePower	402.00	400.00
tblOffRoadEquipment	HorsePower	84.00	300.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Site Prep/ Demolition
tblOffRoadEquipment	PhaseName		Site Prep/ Demolition
tblOffRoadEquipment	UsageHours	7.00	8.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.032
tblProjectCharacteristics	CO2IntensityFactor	641.35	189
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	1,869.00
tblStationaryGeneratorsPumpsUse	HoursPerDay	0.00	1.00
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	50.00
tblStationaryGeneratorsPumpsUse	Load_Factor	0.73	0.80
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	40.00
tblTripsAndVMT	HaulingTripNumber	15.00	0.00
tblTripsAndVMT	HaulingTripNumber	94.00	0.00
tblTripsAndVMT	HaulingTripNumber	0.00	500.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00
tblTripsAndVMT	VendorTripNumber	0.00	13.00
tblTripsAndVMT	VendorTripNumber	62.00	8.00
tblTripsAndVMT	VendorTripNumber	62.00	9.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00
tblTripsAndVMT	VendorTripNumber	0.00	9.00
tblTripsAndVMT	WorkerTripNumber	8.00	40.00
tblTripsAndVMT	WorkerTripNumber	63.00	70.00
tblTripsAndVMT	WorkerTripNumber	139.00	140.00
tblTripsAndVMT	WorkerTripNumber	139.00	70.00
tblTripsAndVMT	WorkerTripNumber	0.00	180.00
tblTripsAndVMT	WorkerTripNumber	28.00	10.00

tblVehicleTrips	ST_TR	1.64	0.00
tblVehicleTrips	ST_TR	49.97	0.00
tblVehicleTrips	ST_TR	1.90	0.00
tblVehicleTrips	SU_TR	0.76	0.00
tblVehicleTrips	SU_TR	25.24	0.00
tblVehicleTrips	SU_TR	1.11	0.00
tblVehicleTrips	WD_TR	11.42	0.00
tblVehicleTrips	WD_TR	42.70	0.00
tblVehicleTrips	WD_TR	8.11	0.00
tblWater	IndoorWaterUseRate	13,987,645.97	974,222.00
tblWater	IndoorWaterUseRate	896,277.51	301,205.00
tblWater	IndoorWaterUseRate	58,019,885.77	3,531,740.00
tblWater	OutdoorWaterUseRate	8,573,073.33	597,104.00
tblWater	OutdoorWaterUseRate	549,331.38	184,610.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.3302	3.0925	1.8433	8.56E-03	0.0544	0.093	0.1474	0.0139	0.0905	0.1044	0	837.8572	837.8572	0.0878	0	840.0513
2021	1.3887	2.1065	1.9018	5.59E-03	0.225	0.0716	0.2966	0.0601	0.0677	0.1278	0	483.6998	483.6998	0.0804	0	485.7101
Maximum	**1.3887**	**3.0925**	**1.9018**	**8.56E-03**	**0.225**	**0.093**	**0.2966**	**0.0601**	**0.0905**	**0.1278**	**0**	**837.8572**	**837.8572**	**0.0878**	**0**	**840.0513**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.1108	0.6366	3.5422	8.56E-03	0.0513	0.0134	0.0647	0.0135	0.0133	0.0268	0	837.8563	837.8563	0.0878	0	840.0504
2021	1.2306	0.535	1.7138	5.59E-03	0.225	5.62E-03	0.2306	0.0601	5.49E-03	0.0656	0	483.6995	483.6995	0.0804	0	485.7097
Maximum	**1.2306**	**0.6366**	**3.5422**	**8.56E-03**	**0.225**	**0.0134**	**0.2306**	**0.0601**	**0.0133**	**0.0656**	**0**	**837.8563**	**837.8563**	**0.0878**	**0**	**840.0504**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive**	**Exhaust**	**PM10 Total**	**Fugitive**	**Exhaust**	**PM2.5**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**21.96**	**77.46**	**-40.34**	**0**	**1.1**	**88.46**	**33.49**	**0.5**	**88.12**	**60.22**	**0**	**0**	**0**	**0**	**0**	**0**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**7-2-2020**	**10-1-2020**	1.4783	0.3154

2	**10-2-2020**	**1-1-2021**	1.9507	0.4336
3	**1-2-2021**	**4-1-2021**	0.7158	0.1632
4	**4-2-2021**	**7-1-2021**	1.0032	0.4191
5	**7-2-2021**	**9-30-2021**	1.6757	1.0903
		Highest	1.9507	1.0903

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	0.9396	5.00E-05	5.90E-03	0		2.00E-05	2.00E-05		2.00E-05	2.00E-05	0	0.0114	0.0114	3.00E-05	0	0.0122
Energy	0.0186	0.1692	0.1421	1.02E-03		0.0129	0.0129		0.0129	0.0129	0	649.3969	649.3969	0.0823	0.0132	655.3945
Mobile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stationary	0.084	0.3758	0.2143	4.00E-04		0.0124	0.0124		0.0124	0.0124	0	38.9978	38.9978	5.47E-03	0	39.1345
Waste						0	0		0	0	19.2578	0	19.2578	1.1381	0	47.7103
Water						0	0		0	0	1.5251	2.4645	3.9896	0.1571	3.75E-03	9.0338
Total	**1.0423**	**0.545**	**0.3623**	**1.42E-03**	**0**	**0.0252**	**0.0252**	**0**	**0.0252**	**0.0252**	**20.7828**	**690.8706**	**711.6534**	**1.383**	**0.017**	**751.2852**

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	0.8371	5.00E-05	5.90E-03	0		2.00E-05	2.00E-05		2.00E-05	2.00E-05	0	0.0114	0.0114	3.00E-05	0	0.0122
Energy	0.0186	0.1692	0.1421	1.02E-03		0.0129	0.0129		0.0129	0.0129	0	649.3969	649.3969	0.0823	0.0132	655.3945
Mobile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stationary	0.084	0.3758	0.2143	4.00E-04		0.0124	0.0124		0.0124	0.0124	0	38.9978	38.9978	5.47E-03	0	39.1345
Waste						0	0		0	0	19.2578	0	19.2578	1.1381	0	47.7103
Water						0	0		0	0	1.2201	2.0042	3.2243	0.1257	3.00E-03	7.26
Total	**0.9397**	**0.545**	**0.3623**	**1.42E-03**	**0**	**0.0252**	**0.0252**	**0**	**0.0252**	**0.0252**	**20.4778**	**690.4103**	**710.8881**	**1.3515**	**0.0162**	**749.5114**

	ROG	**NOx**	**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	**9.84**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1.47**	**0.07**	**0.11**	**2.27**	**4.42**	**0.24**

3.0 Construction Detail

Construction Phase

Phase	Phase Name	Phase Type	Start Date	End Date	Num Days	Num Days	Phase Description

1	Site Prep/ Demolition	Demolition	7/2/2020	8/29/2020	5	42	
2	Site Prep/Demolition	Site Preparation	7/2/2020	8/29/2020	5	42	
3	Foundations	Grading	8/9/2020	1/2/2021	5	105	
4	Structure	Building Construction	1/3/2021	9/13/2021	6	217	
5	Interior Buildout	Building Construction	4/2/2021	10/26/2021	5	148	
6	Skin and Roof	Architectural Coating	6/10/2021	10/5/2021	5	84	
7	Commissioning and Final Inspections	Paving	9/14/2021	12/2/2021	5	58	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0.16

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 313,200; Non-Residential Outdoor: 104,400; Striped Parking Area: 10,344

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Prep/ Demolition	Concrete/Industrial Saws	0	8	81	0.73
Site Prep/ Demolition	Crushing/Proc. Equipment	1	8	200	0.78
Site Prep/ Demolition	Excavators	0	8	158	0.38
Site Prep/ Demolition	Excavators	1	8	300	0.38
Site Prep/ Demolition	Off-Highway Trucks	1	8	300	0.38
Site Prep/ Demolition	Rubber Tired Dozers	0	8	247	0.4
Site Prep/Demolition	Rubber Tired Dozers	0	8	247	0.4
Site Prep/Demolition	Tractors/Loaders/Backhoes	0	8	97	0.37
Foundations	Excavators	2	8	300	0.38
Foundations	Graders	0	8	187	0.41
Foundations	Off-Highway Trucks	18	0.5	400	0.38
Foundations	Pumps	5	8	300	0.74
Foundations	Rubber Tired Dozers	0	8	247	0.4
Foundations	Tractors/Loaders/Backhoes	0	8	97	0.37
Structure	Aerial Lifts	2	8	50	0.31
Structure	Cranes	1	8	400	0.29
Structure	Excavators	1	8	200	0.38
Structure	Forklifts	0	8	89	0.2
Structure	Generator Sets	0	8	84	0.74
Structure	Tractors/Loaders/Backhoes	0	7	97	0.37
Structure	Welders	8	8	15	0.45
Interior Buildout	Cranes	0	7	231	0.29
Interior Buildout	Forklifts	0	8	89	0.2
Interior Buildout	Generator Sets	0	8	84	0.74
Interior Buildout	Tractors/Loaders/Backhoes	0	7	97	0.37
Interior Buildout	Welders	0	8	46	0.45

Skin and Roof	Air Compressors	0	6	78	0.48
Skin and Roof	Cranes	1	8	200	0.29
Commissioning and Final Inspections	Pavers	0	8	130	0.42
Commissioning and Final Inspections	Paving Equipment	0	8	132	0.36
Commissioning and Final Inspections	Rollers	0	8	80	0.38

Trips and VMT

Phase Name	Offroad Equipment	Worker Trip	Vendor Trip	Hauling Trip	Worker Trip	Vendor Trip	Hauling Trip	Worker Vehicle	Vendor Vehicle	Hauling Vehicle
Site Prep/ Demolition	3	40	6	0	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT
Site Prep/Demolition	0	0	0	0	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT
Foundations	25	70	13	500	10.8	7.3	40	LD_Mix	HDT_Mix	HHDT
Structure	12	140	8	0	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT
Interior Buildout	0	70	9	0	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT
Skin and Roof	1	10	9	0	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT
Commissioning and	0	180	6	0	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment
Water Exposed Area
Reduce Vehicle Speed on Unpaved Roads

3.2 Site Prep/ Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.60E-03	0	1.60E-03	2.40E-04	0	2.40E-04	0	0	0	0	0	0
Off-Road	0.0336	0.2818	0.1712	7.60E-04		9.55E-03	9.55E-03		9.09E-03	9.09E-03	0	65.9804	65.9804	0.0131	0	66.3071
Total	**0.0336**	**0.2818**	**0.1712**	**7.60E-04**	**1.60E-03**	**9.55E-03**	**0.0112**	**2.40E-04**	**9.09E-03**	**9.33E-03**	**0**	**65.9804**	**65.9804**	**0.0131**	**0**	**66.3071**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vendor	4.90E-04	0.0146	5.82E-03	3.00E-05	8.20E-04	7.00E-05	8.90E-04	2.40E-04	7.00E-05	3.10E-04	0	3.3389	3.3389	2.90E-04	0	3.3462
Worker	2.29E-03	1.55E-03	0.0164	6.00E-05	6.61E-03	4.00E-05	6.65E-03	1.76E-03	4.00E-05	1.80E-03	0	5.5065	5.5065	1.10E-04	0	5.5091
Total	**2.78E-03**	**0.0162**	**0.0222**	**9.00E-05**	**7.43E-03**	**1.10E-04**	**7.54E-03**	**2.00E-03**	**1.10E-04**	**2.11E-03**	**0**	**8.8454**	**8.8454**	**4.00E-04**	**0**	**8.8553**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.20E-04	0	7.20E-04	1.10E-04	0	1.10E-04	0	0	0	0	0	0
Off-Road	8.53E-03	0.037	0.3129	7.60E-04		1.14E-03	1.14E-03		1.14E-03	1.14E-03	0	65.9804	65.9804	0.0131	0	66.3071
Total	**8.53E-03**	**0.037**	**0.3129**	**7.60E-04**	**7.20E-04**	**1.14E-03**	**1.86E-03**	**1.10E-04**	**1.14E-03**	**1.25E-03**	**0**	**65.9804**	**65.9804**	**0.0131**	**0**	**66.3071**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vendor	4.90E-04	0.0146	5.82E-03	3.00E-05	8.20E-04	7.00E-05	8.90E-04	2.40E-04	7.00E-05	3.10E-04	0	3.3389	3.3389	2.90E-04	0	3.3462
Worker	2.29E-03	1.55E-03	0.0164	6.00E-05	6.61E-03	4.00E-05	6.65E-03	1.76E-03	4.00E-05	1.80E-03	0	5.5065	5.5065	1.10E-04	0	5.5091
Total	**2.78E-03**	**0.0162**	**0.0222**	**9.00E-05**	**7.43E-03**	**1.10E-04**	**7.54E-03**	**2.00E-03**	**1.10E-04**	**2.11E-03**	**0**	**8.8454**	**8.8454**	**4.00E-04**	**0**	**8.8553**

3.3 Site Prep/Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.97E-03	0	3.97E-03	4.30E-04	0	4.30E-04	0	0	0	0	0	0
Off-Road	0	0	0	0		0	0		0	0	0	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**3.97E-03**	**0**	**3.97E-03**	**4.30E-04**	**0**	**4.30E-04**	**0**	**0**	**0**	**0**	**0**	**0**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vendor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Worker	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.78E-03	0	1.78E-03	1.90E-04	0	1.90E-04	0	0	0	0	0	0
Off-Road	0	0	0	0		0	0		0	0	0	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**1.78E-03**	**0**	**1.78E-03**	**1.90E-04**	**0**	**1.90E-04**	**0**	**0**	**0**	**0**	**0**	**0**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vendor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Worker	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

3.4 Foundations - 2020
Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0	0	0	0	0	0	0	0	0	0	0	0
Off-Road	0.2773	2.5709	1.4874	6.87E-03		0.0823	0.0823		0.0803	0.0803	0	681.5689	681.5689	0.0673	0	683.2517
Total	**0.2773**	**2.5709**	**1.4874**	**6.87E-03**	**0**	**0.0823**	**0.0823**	**0**	**0.0803**	**0.0803**	**0**	**681.5689**	**681.5689**	**0.0673**	**0**	**683.2517**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.95E-03	0.1385	0.0604	3.90E-04	8.34E-03	4.80E-04	8.82E-03	2.29E-03	4.60E-04	2.75E-03	0	39.6877	39.6877	4.97E-03	0	39.8118
Vendor	2.62E-03	0.0784	0.0312	1.80E-04	4.41E-03	3.90E-04	4.80E-03	1.27E-03	3.70E-04	1.65E-03	0	17.9136	17.9136	1.56E-03	0	17.9525
Worker	9.93E-03	6.73E-03	0.0708	2.60E-04	0.0287	1.80E-04	0.0288	7.63E-03	1.70E-04	7.79E-03	0	23.8613	23.8613	4.70E-04	0	23.8729
Total	**0.0165**	**0.2236**	**0.1624**	**8.30E-04**	**0.0414**	**1.05E-03**	**0.0425**	**0.0112**	**1.00E-03**	**0.0122**	**0**	**81.4625**	**81.4625**	**7.00E-03**	**0**	**81.6372**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0	0	0	0	0	0	0	0	0	0	0	0
Off-Road	0.083	0.3598	3.0447	6.87E-03		0.0111	0.0111		0.0111	0.0111	0	681.5681	681.5681	0.0673	0	683.2509
Total	**0.083**	**0.3598**	**3.0447**	**6.87E-03**	**0**	**0.0111**	**0.0111**	**0**	**0.0111**	**0.0111**	**0**	**681.5681**	**681.5681**	**0.0673**	**0**	**683.2509**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.95E-03	0.1385	0.0604	3.90E-04	8.34E-03	4.80E-04	8.82E-03	2.29E-03	4.60E-04	2.75E-03	0	39.6877	39.6877	4.97E-03	0	39.8118
Vendor	2.62E-03	0.0784	0.0312	1.80E-04	4.41E-03	3.90E-04	4.80E-03	1.27E-03	3.70E-04	1.65E-03	0	17.9136	17.9136	1.56E-03	0	17.9525
Worker	9.93E-03	6.73E-03	0.0708	2.60E-04	0.0287	1.80E-04	0.0288	7.63E-03	1.70E-04	7.79E-03	0	23.8613	23.8613	4.70E-04	0	23.8729
Total	**0.0165**	**0.2236**	**0.1624**	**8.30E-04**	**0.0414**	**1.05E-03**	**0.0425**	**0.0112**	**1.00E-03**	**0.0122**	**0**	**81.4625**	**81.4625**	**7.00E-03**	**0**	**81.6372**

3.4 Foundations - 2021
Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0	0	0	0	0	0	0	0	0	0	0	0
Off-Road	2.48E-03	0.0211	0.0141	7.00E-05		6.90E-04	6.90E-04		6.70E-04	6.70E-04	0	6.5523	6.5523	6.40E-04	0	6.5682
Total	**2.48E-03**	**0.0211**	**0.0141**	**7.00E-05**	**0**	**6.90E-04**	**6.90E-04**	**0**	**6.70E-04**	**6.70E-04**	**0**	**6.5523**	**6.5523**	**6.40E-04**	**0**	**6.5682**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.00E-05	1.22E-03	6.00E-04	0	6.31E-03	0	6.32E-03	1.55E-03	0	1.56E-03	0	0.3752	0.3752	5.00E-05	0	0.3765
Vendor	2.00E-05	6.80E-04	2.90E-04	0	4.00E-05	0	4.00E-05	1.00E-05	0	1.00E-05	0	0.1701	0.1701	1.00E-05	0	0.1705
Worker	9.00E-05	6.00E-05	6.30E-04	0	2.80E-04	0	2.80E-04	7.00E-05	0	7.00E-05	0	0.2213	0.2213	0	0	0.2214
Total	**1.50E-04**	**1.96E-03**	**1.52E-03**	**0**	**6.63E-03**	**0**	**6.64E-03**	**1.63E-03**	**0**	**1.64E-03**	**0**	**0.7666**	**0.7666**	**6.00E-05**	**0**	**0.7683**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0	0	0	0	0	0	0	0	0	0	0	0
Off-Road	8.00E-04	3.46E-03	0.0293	7.00E-05		1.10E-04	1.10E-04		1.10E-04	1.10E-04	0	6.5522	6.5522	6.40E-04	0	6.5682
Total	**8.00E-04**	**3.46E-03**	**0.0293**	**7.00E-05**	**0**	**1.10E-04**	**1.10E-04**	**0**	**1.10E-04**	**1.10E-04**	**0**	**6.5522**	**6.5522**	**6.40E-04**	**0**	**6.5682**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.00E-05	1.22E-03	6.00E-04	0	6.31E-03	0	6.32E-03	1.55E-03	0	1.56E-03	0	0.3752	0.3752	5.00E-05	0	0.3765
Vendor	2.00E-05	6.80E-04	2.90E-04	0	4.00E-05	0	4.00E-05	1.00E-05	0	1.00E-05	0	0.1701	0.1701	1.00E-05	0	0.1705
Worker	9.00E-05	6.00E-05	6.30E-04	0	2.80E-04	0	2.80E-04	7.00E-05	0	7.00E-05	0	0.2213	0.2213	0	0	0.2214
Total	**1.50E-04**	**1.96E-03**	**1.52E-03**	**0**	**6.63E-03**	**0**	**6.64E-03**	**1.63E-03**	**0**	**1.64E-03**	**0**	**0.7666**	**0.7666**	**6.00E-05**	**0**	**0.7683**

3.5 Structure - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1731	1.6467	1.2535	2.94E-03		0.062	0.062		0.0588	0.0588	0	238.9197	238.9197	0.066	0	240.5707
Total	**0.1731**	**1.6467**	**1.2535**	**2.94E-03**		**0.062**	**0.062**		**0.0588**	**0.0588**	**0**	**238.9197**	**238.9197**	**0.066**	**0**	**240.5707**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vendor	2.77E-03	0.0904	0.0388	2.30E-04	5.66E-03	2.10E-04	5.87E-03	1.64E-03	2.00E-04	1.83E-03	0	22.7158	22.7158	1.96E-03	0	22.7649
Worker	0.0387	0.0252	0.273	1.06E-03	0.1196	7.30E-04	0.1203	0.0318	6.70E-04	0.0325	0	96.0328	96.0328	1.74E-03	0	96.0764
Total	**0.0415**	**0.1156**	**0.3118**	**1.29E-03**	**0.1252**	**9.40E-04**	**0.1262**	**0.0335**	**8.70E-04**	**0.0343**	**0**	**118.7486**	**118.7486**	**3.70E-03**	**0**	**118.8413**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0292	0.2581	1.0278	2.94E-03		3.41E-03	3.41E-03		3.41E-03	3.41E-03	0	238.9194	238.9194	0.066	0	240.5704
Total	**0.0292**	**0.2581**	**1.0278**	**2.94E-03**		**3.41E-03**	**3.41E-03**		**3.41E-03**	**3.41E-03**	**0**	**238.9194**	**238.9194**	**0.066**	**0**	**240.5704**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vendor	2.77E-03	0.0904	0.0388	2.30E-04	5.66E-03	2.10E-04	5.87E-03	1.64E-03	2.00E-04	1.83E-03	0	22.7158	22.7158	1.96E-03	0	22.7649
Worker	0.0387	0.0252	0.273	1.06E-03	0.1196	7.30E-04	0.1203	0.0318	6.70E-04	0.0325	0	96.0328	96.0328	1.74E-03	0	96.0764
Total	**0.0415**	**0.1156**	**0.3118**	**1.29E-03**	**0.1252**	**9.40E-04**	**0.1262**	**0.0335**	**8.70E-04**	**0.0343**	**0**	**118.7486**	**118.7486**	**3.70E-03**	**0**	**118.8413**

3.6 Interior Buildout - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0	0	0	0		0	0		0	0	0	0	0	0	0	0
Total	**0**	**0**	**0**	**0**		**0**	**0**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vendor	2.13E-03	0.0694	0.0298	1.70E-04	4.34E-03	1.60E-04	4.50E-03	1.26E-03	1.50E-04	1.41E-03	0	17.4294	17.4294	1.51E-03	0	17.4671
Worker	0.0132	8.59E-03	0.0931	3.60E-04	0.0408	2.50E-04	0.041	0.0109	2.30E-04	0.0111	0	32.7485	32.7485	5.90E-04	0	32.7634
Total	**0.0153**	**0.078**	**0.1229**	**5.30E-04**	**0.0451**	**4.10E-04**	**0.0455**	**0.0121**	**3.80E-04**	**0.0125**	**0**	**50.1779**	**50.1779**	**2.10E-03**	**0**	**50.2305**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0	0	0	0		0	0		0	0	0	0	0	0	0	0

Total	0	0	0	0		0	0		0	0	0	0	0	0	0	0

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vendor	2.13E-03	0.0694	0.0298	1.70E-04	4.34E-03	1.60E-04	4.50E-03	1.26E-03	1.50E-04	1.41E-03	0	17.4294	17.4294	1.51E-03	0	17.4671
Worker	0.0132	8.59E-03	0.0931	3.60E-04	0.0408	2.50E-04	0.041	0.0109	2.30E-04	0.0111	0	32.7485	32.7485	5.90E-04	0	32.7634
Total	**0.0153**	**0.078**	**0.1229**	**5.30E-04**	**0.0451**	**4.10E-04**	**0.0455**	**0.0121**	**3.80E-04**	**0.0125**	**0**	**50.1779**	**50.1779**	**2.10E-03**	**0**	**50.2305**

3.7 Skin and Roof - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.1247					0	0		0	0	0	0	0	0	0	0
Off-Road	0.015	0.1763	0.0721	2.10E-04		7.16E-03	7.16E-03		6.59E-03	6.59E-03	0	18.432	18.432	5.96E-03	0	18.581
Total	**1.1397**	**0.1763**	**0.0721**	**2.10E-04**		**7.16E-03**	**7.16E-03**		**6.59E-03**	**6.59E-03**	**0**	**18.432**	**18.432**	**5.96E-03**	**0**	**18.581**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vendor	1.21E-03	0.0394	0.0169	1.00E-04	2.46E-03	9.00E-05	2.55E-03	7.10E-04	9.00E-05	8.00E-04	0	9.8924	9.8924	8.50E-04	0	9.9138
Worker	1.07E-03	7.00E-04	7.55E-03	3.00E-05	3.31E-03	2.00E-05	3.33E-03	8.80E-04	2.00E-05	9.00E-04	0	2.6553	2.6553	5.00E-05	0	2.6565
Total	**2.28E-03**	**0.0401**	**0.0245**	**1.30E-04**	**5.77E-03**	**1.10E-04**	**5.88E-03**	**1.59E-03**	**1.10E-04**	**1.70E-03**	**0**	**12.5477**	**12.5477**	**9.00E-04**	**0**	**12.5703**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.1247					0	0		0	0	0	0	0	0	0	0
Off-Road	2.58E-03	0.0112	0.0945	2.10E-04		3.40E-04	3.40E-04		3.40E-04	3.40E-04	0	18.432	18.432	5.96E-03	0	18.581
Total	**1.1273**	**0.0112**	**0.0945**	**2.10E-04**		**3.40E-04**	**3.40E-04**		**3.40E-04**	**3.40E-04**	**0**	**18.432**	**18.432**	**5.96E-03**	**0**	**18.581**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vendor	1.21E-03	0.0394	0.0169	1.00E-04	2.46E-03	9.00E-05	2.55E-03	7.10E-04	9.00E-05	8.00E-04	0	9.8924	9.8924	8.50E-04	0	9.9138
Worker	1.07E-03	7.00E-04	7.55E-03	3.00E-05	3.31E-03	2.00E-05	3.33E-03	8.80E-04	2.00E-05	9.00E-04	0	2.6553	2.6553	5.00E-05	0	2.6565

Total	2.28E-03	0.0401	0.0245	1.30E-04	5.77E-03	1.10E-04	5.88E-03	1.59E-03	1.10E-04	1.70E-03	0	12.5477	12.5477	9.00E-04	0	12.5703

3.8 Commissioning and Final Inspections - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0	0	0	0		0	0		0	0	0	0	0	0	0	0
Paving	2.10E-04					0	0		0	0	0	0	0	0	0	0
Total	**2.10E-04**	**0**	**0**	**0**		**0**	**0**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vendor	5.60E-04	0.0181	7.78E-03	5.00E-05	1.13E-03	4.00E-05	1.18E-03	3.30E-04	4.00E-05	3.70E-04	0	4.5536	4.5536	3.90E-04	0	4.5635
Worker	0.0133	8.66E-03	0.0938	3.60E-04	0.0411	2.50E-04	0.0413	0.0109	2.30E-04	0.0112	0	33.0014	33.0014	6.00E-04	0	33.0164
Total	**0.0139**	**0.0268**	**0.1016**	**4.10E-04**	**0.0422**	**2.90E-04**	**0.0425**	**0.0113**	**2.70E-04**	**0.0115**	**0**	**37.555**	**37.555**	**9.90E-04**	**0**	**37.5798**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0	0	0	0		0	0		0	0	0	0	0	0	0	0
Paving	2.10E-04					0	0		0	0	0	0	0	0	0	0
Total	**2.10E-04**	**0**	**0**	**0**		**0**	**0**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vendor	5.60E-04	0.0181	7.78E-03	5.00E-05	1.13E-03	4.00E-05	1.18E-03	3.30E-04	4.00E-05	3.70E-04	0	4.5536	4.5536	3.90E-04	0	4.5635
Worker	0.0133	8.66E-03	0.0938	3.60E-04	0.0411	2.50E-04	0.0413	0.0109	2.30E-04	0.0112	0	33.0014	33.0014	6.00E-04	0	33.0164
Total	**0.0139**	**0.0268**	**0.1016**	**4.10E-04**	**0.0422**	**2.90E-04**	**0.0425**	**0.0113**	**2.70E-04**	**0.0115**	**0**	**37.555**	**37.555**	**9.90E-04**	**0**	**37.5798**

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity						0	0		0	0	0	465.1966	465.1966	0.0788	9.85E-03	470.0996
Electricity						0	0		0	0	0	465.1966	465.1966	0.0788	9.85E-03	470.0996
NaturalGas Mitigated	0.0186	0.1692	0.1421	1.02E-03		0.0129	0.0129		0.0129	0.0129	0	184.2002	184.2002	3.53E-03	3.38E-03	185.2948
NaturalGas	0.0186	0.1692	0.1421	1.02E-03		0.0129	0.0129		0.0129	0.0129	0	184.2002	184.2002	3.53E-03	3.38E-03	185.2948

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Office Park	3.45E+06	0.0186	0.1692	0.1421	1.02E-03		0.0129	0.0129		0.0129	0.0129	0	184.2002	184.2002	3.53E-03	3.38E-03	185.2948
Parking Lot	0	0	0	0	0		0	0		0	0	0	0	0	0	0	0
Regional	0	0	0	0	0		0	0		0	0	0	0	0	0	0	0
Research &	0	0	0	0	0		0	0		0	0	0	0	0	0	0	0
Total		**0.0186**	**0.1692**	**0.1421**	**1.02E-03**		**0.0129**	**0.0129**		**0.0129**	**0.0129**	**0**	**184.2002**	**184.2002**	**3.53E-03**	**3.38E-03**	**185.2948**

Mitigated

	NaturalGas	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Office Park	3.45E+06	0.0186	0.1692	0.1421	1.02E-03		0.0129	0.0129		0.0129	0.0129	0	184.2002	184.2002	3.53E-03	3.38E-03	185.2948
Parking Lot	0	0	0	0	0		0	0		0	0	0	0	0	0	0	0
Regional	0	0	0	0	0		0	0		0	0	0	0	0	0	0	0
Research &	0	0	0	0	0		0	0		0	0	0	0	0	0	0	0
Total		**0.0186**	**0.1692**	**0.1421**	**1.02E-03**		**0.0129**	**0.0129**		**0.0129**	**0.0129**	**0**	**184.2002**	**184.2002**	**3.53E-03**	**3.38E-03**	**185.2948**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Office Park	5.43E+06	465.1966	0.0788	9.85E-03	470.0996
Parking Lot	0	0	0	0	0
Regional	0	0	0	0	0
Research &	0	0	0	0	0
Total		**465.1966**	**0.0788**	**9.85E-03**	**470.0996**

Mitigated

	Electricity	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Office Park	5.43E+06	465.1966	0.0788	9.85E-03	470.0996
Parking Lot	0	0	0	0	0
Regional	0	0	0	0	0
Research &	0	0	0	0	0
Total		**465.1966**	**0.0788**	**9.85E-03**	**470.0996**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.8371	5.00E-05	5.90E-03	0		2.00E-05	2.00E-05		2.00E-05	2.00E-05	0	0.0114	0.0114	3.00E-05	0	0.0122
Unmitigated	0.8371	5.00E-05	5.90E-03	0		2.00E-05	2.00E-05		2.00E-05	2.00E-05	0	0.0114	0.0114	3.00E-05	0	0.0122

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural	0.1125					0	0		0	0	0	0	0	0	0	0
Consumer	0.8266					0	0		0	0	0	0	0	0	0	0
Landscaping	5.50E-04	5.00E-05	5.90E-03	0		2.00E-05	2.00E-05		2.00E-05	2.00E-05	0	0.0114	0.0114	3.00E-05	0	0.0122
Total	**0.9396**	**5.00E-05**	**5.90E-03**	**0**		**2.00E-05**	**2.00E-05**		**2.00E-05**	**2.00E-05**	**0**	**0.0114**	**0.0114**	**3.00E-05**	**0**	**0.0122**

Mitigated

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural	0.1125					0	0		0	0	0	0	0	0	0	0
Consumer	0.8266					0	0		0	0	0	0	0	0	0	0
Landscaping	5.50E-04	5.00E-05	5.90E-03	0		2.00E-05	2.00E-05		2.00E-05	2.00E-05	0	0.0114	0.0114	3.00E-05	0	0.0122
Total	**0.9396**	**5.00E-05**	**5.90E-03**	**0**		**2.00E-05**	**2.00E-05**		**2.00E-05**	**2.00E-05**	**0**	**0.0114**	**0.0114**	**3.00E-05**	**0**	**0.0122**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet
Install Low Flow Kitchen Faucet
Install Low Flow Toilet
Install Low Flow Shower
Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	3.2243	0.1257	3.00E-03	7.26
Unmitigated	3.9896	0.1571	3.75E-03	9.0338

7.2 Water by Land Use

Unmitigated

	Indoor/Outdo	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Office Park	0.974222 /	0.9402	0.0319	7.60E-04	1.9638
Parking Lot	0 / 0	0	0	0	0
Regional	0.301205 /	0.2907	9.85E-03	2.40E-04	0.6072
Research &	3.53174 / 0	2.7588	0.1154	2.75E-03	6.4628
Total		**3.9896**	**0.1571**	**3.75E-03**	**9.0338**

Mitigated

	Indoor/Outdo	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Office Park	0.779378 /	0.777	0.0255	6.10E-04	1.5962
Parking Lot	0 / 0	0	0	0	0
Regional	0.240964 /	0.2402	7.88E-03	1.90E-04	0.4935
Research &	2.82539 / 0	2.207	0.0923	2.20E-03	5.1703
Total		**3.2243**	**0.1257**	**3.00E-03**	**7.26**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	19.2578	1.1381	0	47.7103
Unmitigated	19.2578	1.1381	0	47.7103

8.2 Waste by Land Use

Unmitigated

	Waste	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Office Park	73.19	14.8569	0.878	0	36.8074
Parking Lot	0	0	0	0	0
Regional	12.71	2.58	0.1525	0	6.3919
Research &	8.97	1.8208	0.1076	0	4.511
Total		**19.2578**	**1.1381**	**0**	**47.7103**

Mitigated

	Waste	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Office Park	73.19	14.8569	0.878	0	36.8074
Parking Lot	0	0	0	0	0
Regional	12.71	2.58	0.1525	0	6.3919
Research &	8.97	1.8208	0.1076	0	4.511
Total		**19.2578**	**1.1381**	**0**	**47.7103**

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
Emergency Generator	1	1	50	1869	0.8	Diesel

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

10.1 Stationary Sources

Unmitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10 Total	Fugitive	Exhaust	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Emergency	0.084	0.3758	0.2143	4.00E-04		0.0124	0.0124		0.0124	0.0124	0	38.9978	38.9978	5.47E-03	0	39.1345
Total	**0.084**	**0.3758**	**0.2143**	**4.00E-04**		**0.0124**	**0.0124**		**0.0124**	**0.0124**	**0**	**38.9978**	**38.9978**	**5.47E-03**	**0**	**39.1345**

701 Gateway - Sequestration Only
San Mateo County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	170.24	1000sqft	3.20	170,235.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 70

Climate Zone 5 **Operational Year** 2021

Utility Company Pacific Gas & Electric Company

CO2 Intensity (lb/MWhr) 189 **CH4 Intensity (lb/MWhr)** 0.032 **N2O Intensity (lb/MWhr)** 0.004

1.3 User Entered Comments & Non-Default Data

Sequestration - net tree loss

Table Name	Column Name	Default Value	New Value
tblSequestration	NumberOfNewTrees	0.00	63.00

2.0 Emissions Summary

2.3 Vegetation

Vegetation

Category	CO2e
	MT
New Trees	46.2420
Total	**46.242**

11.2 Net New Trees

Species Class

	Number of Trees	Total CO2	CH4	N2O	CO2e
		MT			
Mixed Hardwood	63	46.2420	0.0000	0.0000	46.2420
Total		**46.2420**	**0.0000**	**0.0000**	**46.2420**

Construction Energy

Year	Annual kWh	Annual MWh	CO2 (metric tons)	CH4 (metric tons)	N2O (metric tons)	CO2e (metric tons)
2020	52,000	52	5.0	0.00078	0.00009	4.99977
2021	52,000	52	4.5	0.00075	0.00009	4.50268

GHG Emission Factors

Year	CO2	CH4	N20
2020	210	0.0329	0.0039
2021	189	0.0316	0.0037

Source: eGrid (2018); PG&E (2019); *see RPS Electricity Efs*

Conversions

kWh-MWh	0.001	Standard
lb-ton	0.000453592	Standard
CH4 GWP	25	CARB
N2O GWP	298	CARB

Source: CARB (2020) https://ww2.arb.ca.gov/ghg-gwps

701 Gateway - Operation (2021)
San Mateo County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	170.24	1000sqft	3.20	170,235.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	70
Climate Zone	5			**Operational Year**	2021
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity	189	**CH4 Intensity**	0.032	**N2O Intensity**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - EFs adjusted for SB 100
Land Use - sf and spaces provided by applicant; lot acreage scaled by sf with parking lot
Construction Phase - operational analysis only
Off-road Equipment - operational analysis only
Off-road Equipment - operational analysis only
Off-road Equipment - operational analysis only
Off-road Equipment - operational analysis only
Off-road Equipment - operational analysis only
Off-road Equipment - operational analysis only
Trips and VMT - operational analysis only
Grading -
Architectural Coating - operational analysis only
Vehicle Trips - mobile emissions modeled separately
Energy Use - Energy consumption provided by applicant
Water And Wastewater - water usage provided by project applicant; assumed Caleemod default for general office building of 62% indoor/38% outdoor
Land Use Change -

Sequestration -
Stationary Sources - Emergency Generators and Fire Pumps - assumed existing generator at 701 Gateway to have same specs as future generator at
Demolition -
Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblEnergyUse	LightingElect	3.58	0.00
tblEnergyUse	NT24E	4.80	0.00
tblEnergyUse	NT24NG	1.01	0.00
tblEnergyUse	T24E	4.10	9.83
tblEnergyUse	T24NG	18.32	26.24
tblLandUse	LandUseSquareFeet	170,240.00	170,235.00
tblLandUse	LotAcreage	3.91	3.20
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.032
tblProjectCharacteristics	CO2IntensityFactor	641.35	189
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblStationaryGeneratorsPumpsEF	CH4_EF	0.07	0.07
tblStationaryGeneratorsPumpsEF	ROG_EF	2.2480e-003	2.2477e-003
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	1,869.00
tblStationaryGeneratorsPumpsUse	HoursPerDay	0.00	1.00
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	50.00
tblStationaryGeneratorsPumpsUse	Load_Factor	0.73	0.80
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	1.00

tblTripsAndVMT	VendorTripNumber	28.00	0.00
tblTripsAndVMT	WorkerTripNumber	54.00	0.00
tblTripsAndVMT	WorkerTripNumber	11.00	0.00
tblVehicleTrips	ST_TR	2.46	0.00
tblVehicleTrips	SU_TR	1.05	0.00
tblVehicleTrips	WD_TR	11.03	0.00
tblWater	IndoorWaterUseRate	30,257,393.26	2,107,306.00
tblWater	OutdoorWaterUseRate	18,544,853.93	1,291,574.00

2.0 Emissions Summary

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.1311	1.60E-04	0.0175	0		6.00E-05	6.00E-05		6.00E-05	6.00E-05		0.0373	0.0373	1.00E-04		0.0397
Energy	0.132	1.1997	1.0078	7.20E-03		0.0912	0.0912		0.0912	0.0912		1,439.68	1,439.68	0.0276	0.0264	1,448.23
Mobile	0	0	0	0	0	0	0	0	0	0		0	0	0		0
Stationary	3.3608	15.0314	8.5705	0.0162		0.4945	0.4945		0.4945	0.4945		1,719.51	1,719.51	0.2411		1,725.54
Total	**7.6238**	**16.2313**	**9.5957**	**0.0234**	**0**	**0.5857**	**0.5857**	**0**	**0.5857**	**0.5857**		**3,159.22**	**3,159.22**	**0.2688**	**0.0264**	**3,173.81**

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas	0.132	1.1997	1.0078	7.20E-03		0.0912	0.0912		0.0912	0.0912		1,439.68	1,439.68	0.0276	0.0264	1,448.23
NaturalGas	0.132	1.1997	1.0078	7.20E-03		0.0912	0.0912		0.0912	0.0912		1,439.68	1,439.68	0.0276	0.0264	1,448.23

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGa	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Office	12237.3	0.132	1.1997	1.0078	7.20E-03		0.0912	0.0912		0.0912	0.0912		1,439.68	1,439.68	0.0276	0.0264	1,448.23
Total		**0.132**	**1.1997**	**1.0078**	**7.20E-03**		**0.0912**	**0.0912**		**0.0912**	**0.0912**		**1,439.68**	**1,439.68**	**0.0276**	**0.0264**	**1,448.23**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.1311	1.60E-04	0.0175	0		6.00E-05	6.00E-05		6.00E-05	6.00E-05		0.0373	0.0373	1.00E-04		0.0397
Unmitigated	4.1311	1.60E-04	0.0175	0		6.00E-05	6.00E-05		6.00E-05	6.00E-05		0.0373	0.0373	1.00E-04		0.0397

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural	0.4864					0	0		0	0			0			0
Consumer	3.643					0	0		0	0			0			0
Landscaping	1.63E-03	1.60E-04	0.0175	0		6.00E-05	6.00E-05		6.00E-05	6.00E-05		0.0373	0.0373	1.00E-04		0.0397
Total	**4.1311**	**1.60E-04**	**0.0175**	**0**		**6.00E-05**	**6.00E-05**		**6.00E-05**	**6.00E-05**		**0.0373**	**0.0373**	**1.00E-04**		**0.0397**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

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
Emergency Generator	1	1	50	1869	0.8	Diesel

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

10.1 Stationary Sources

Unmitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Equipment Type	lb/day										lb/day					
Emergency	3.3608	15.0314	8.5705	0.0162		0.4945	0.4945		0.4945	0.4945		1,719.51	1,719.51	0.2411		1,725.54
Total	**3.3608**	**15.0314**	**8.5705**	**0.0162**		**0.4945**	**0.4945**		**0.4945**	**0.4945**		**1,719.51**	**1,719.51**	**0.2411**		**1,725.54**

11.0 Vegetation

701 Gateway - Operation (2021)
San Mateo County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	170.24	1000sqft	3.20	170,235.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	70
Climate Zone	5			**Operational Year**	2021
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity	189	**CH4 Intensity**	0.032	**N2O Intensity**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - EFs adjusted for SB 100
Land Use - sf and spaces provided by applicant; lot acreage scaled by sf with parking lot
Construction Phase - operational analysis only
Off-road Equipment - operational analysis only
Off-road Equipment - operational analysis only
Off-road Equipment - operational analysis only
Off-road Equipment - operational analysis only
Off-road Equipment - operational analysis only
Off-road Equipment - operational analysis only
Trips and VMT - operational analysis only
Grading -
Architectural Coating - operational analysis only
Vehicle Trips - mobile emissions modeled separately
Energy Use - Energy consumption provided by applicant
Water And Wastewater - water usage provided by project applicant; assumed Caleemod default for general office building of 62% indoor/38% outdoor
Land Use Change -

Sequestration -
Stationary Sources - Emergency Generators and Fire Pumps - assumed existing generator at 701 Gateway to have same specs as future generator at
Demolition -
Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblEnergyUse	LightingElect	3.58	0.00
tblEnergyUse	NT24E	4.80	0.00
tblEnergyUse	NT24NG	1.01	0.00
tblEnergyUse	T24E	4.10	9.83
tblEnergyUse	T24NG	18.32	26.24
tblLandUse	LandUseSquareFeet	170,240.00	170,235.00
tblLandUse	LotAcreage	3.91	3.20
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.032
tblProjectCharacteristics	CO2IntensityFactor	641.35	189
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblStationaryGeneratorsPumpsEF	CH4_EF	0.07	0.07
tblStationaryGeneratorsPumpsEF	ROG_EF	2.2480e-003	2.2477e-003
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	1,869.00
tblStationaryGeneratorsPumpsUse	HoursPerDay	0.00	1.00
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	50.00
tblStationaryGeneratorsPumpsUse	Load_Factor	0.73	0.80
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	1.00

tblTripsAndVMT	VendorTripNumber	28.00	0.00
tblTripsAndVMT	WorkerTripNumber	54.00	0.00
tblTripsAndVMT	WorkerTripNumber	11.00	0.00
tblVehicleTrips	ST_TR	2.46	0.00
tblVehicleTrips	SU_TR	1.05	0.00
tblVehicleTrips	WD_TR	11.03	0.00
tblWater	IndoorWaterUseRate	30,257,393.26	2,107,306.00
tblWater	OutdoorWaterUseRate	18,544,853.93	1,291,574.00

2.0 Emissions Summary

2.2 Overall Operational
Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.7538	1.00E-05	1.57E-03	0		1.00E-05	1.00E-05		1.00E-05	1.00E-05	0	3.04E-03	3.04E-03	1.00E-05	0	3.24E-03
Energy	0.0241	0.219	0.1839	1.31E-03		0.0166	0.0166		0.0166	0.0166	0	381.8634	381.8634	0.0289	7.41E-03	384.7924
Mobile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stationary	0.084	0.3758	0.2143	4.00E-04		0.0124	0.0124		0.0124	0.0124	0	38.9978	38.9978	5.47E-03	0	39.1345
Waste						0	0		0	0	32.1375	0	32.1375	1.8993	0	79.6194
Water						0	0		0	0	0.6686	1.3651	2.0336	0.0689	1.65E-03	4.2479
Total	**0.8619**	**0.5947**	**0.3998**	**1.71E-03**	**0**	**0.029**	**0.029**	**0**	**0.029**	**0.029**	**32.8061**	**422.2293**	**455.0354**	**2.0025**	**9.06E-03**	**507.7973**

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity						0	0		0	0	0	143.5086	143.5086	0.0243	3.04E-03	145.0211
Electricity						0	0		0	0	0	143.5086	143.5086	0.0243	3.04E-03	145.0211
NaturalGas	0.0241	0.219	0.1839	1.31E-03		0.0166	0.0166		0.0166	0.0166	0	238.3548	238.3548	4.57E-03	4.37E-03	239.7712
NaturalGas	0.0241	0.219	0.1839	1.31E-03		0.0166	0.0166		0.0166	0.0166	0	238.3548	238.3548	4.57E-03	4.37E-03	239.7712

5.2 Energy by Land Use - NaturalGas
Unmitigated

	NaturalGa	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Land Use	kBTU/yr	tons/yr										MT/yr					
General Office Building	4.47E+06	0.0241	0.219	0.1839	1.31E-03		0.0166	0.0166		0.0166	0.0166	0	238.3548	238.3548	4.57E-03	4.37E-03	239.7712
Total		**0.0241**	**0.219**	**0.1839**	**1.31E-03**		**0.0166**	**0.0166**		**0.0166**	**0.0166**	**0**	**238.3548**	**238.3548**	**4.57E-03**	**4.37E-03**	**239.7712**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Office Building	1.67E+06	143.5086	0.0243	3.04E-03	145.0211
Total		**143.5086**	**0.0243**	**3.04E-03**	**145.0211**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.7538	1.00E-05	1.57E-03	0		1.00E-05	1.00E-05		1.00E-05	1.00E-05	0	3.04E-03	3.04E-03	1.00E-05	0	3.24E-03
Unmitigated	0.7538	1.00E-05	1.57E-03	0		1.00E-05	1.00E-05		1.00E-05	1.00E-05	0	3.04E-03	3.04E-03	1.00E-05	0	3.24E-03

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural	0.0888					0	0		0	0	0	0	0	0	0	0
Consumer	0.6649					0	0		0	0	0	0	0	0	0	0
Landscaping	1.50E-04	1.00E-05	1.57E-03	0		1.00E-05	1.00E-05		1.00E-05	1.00E-05	0	3.04E-03	3.04E-03	1.00E-05	0	3.24E-03
Total	**0.7538**	**1.00E-05**	**1.57E-03**	**0**		**1.00E-05**	**1.00E-05**		**1.00E-05**	**1.00E-05**	**0**	**3.04E-03**	**3.04E-03**	**1.00E-05**	**0**	**3.24E-03**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	2.0336	0.0689	1.65E-03	4.2479

Unmitigated	2.0336	0.0689	1.65E-03	4.2479

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Office Building	2.10731 / 1.29157	2.0336	0.0689	1.6500e-003	4.2479
Total		**2.0336**	**0.0689**	**1.6500e-003**	**4.2479**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	32.1375	1.8993	0	79.6194
Unmitigated	32.1375	1.8993	0	79.6194

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Office	158.32	32.1375	1.8993	0	79.6194
Total		**32.1375**	**1.8993**	**0**	**79.6194**

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
Emergency Generator	1	1	50	1869	0.8	Diesel

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

10.1 Stationary Sources

Unmitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive	Exhaust	PM10	Fugitive	Exhaust	PM2.5	Bio- CO2	NBio-	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Emergency	0.084	0.3758	0.2143	4.00E-04		0.0124	0.0124		0.0124	0.0124	0	38.9978	38.9978	5.47E-03	0	39.1345
Total	**0.084**	**0.3758**	**0.2143**	**4.00E-04**		**0.0124**	**0.0124**		**0.0124**	**0.0124**	**0**	**38.9978**	**38.9978**	**5.47E-03**	**0**	**39.1345**

11.0 Vegetation

GHG Emission Factors (Energy)

eGrid2018 Emission Factors

https://www.epa.gov/sites/production/files/2020-01/documents/egrid2018_summary_tables.pdf

496.536 lb CO2/MWh

0.034 lb CH4/MWh
0.004 lb N2O/MWh

PG&E

210.000 lb CO2/MWh

https://www.pge.com/en_US/about-pge/environment/what-we-are-doing/fighting-climate-change/fighting-climate-change.page
https://www.pge.com/pge_global/common/pdfs/your-account/your-bill/understand-your-bill/bill-inserts/2019/1019-Power-Content-Label.pdf

2018 CA	**%**	**EF (lb/MWh)**		
		CO2	**CH4**	**N2O**
Hydro	10.68%	0	0	0
Nuclear	9.05%	0	0	0
Renewable	31.36%	0	0	0
Non-renewable	48.91%	1015	0.070	0.008
Total	100.00%	497	0.034	0.004

2020 (RPS = 33%)	**%**	**EF (lb/MWh)**		
		CO2	**CH4**	**N2O**
Hydro	10.68%	0	0	0
Nuclear	9.05%	0	0	0
Renewable	33.00%	0	0	0
Non-renewable	47.27%	1015	0.070	0.008
Total	100.00%	480	0.033	0.004

2030 (RPS = 60%)	**%**	**EF (lb/MWh)**		
		CO2	**CH4**	**N2O**
Hydro	10.68%	0	0	0
Nuclear	0.00%	0	0	0
Renewable	60.00%	0	0	0
Non-renewable	29.32%	1015	0.070	0.008
Total	100.00%	298	0.020	0.002

2045 (Carbon Free)	**%**	**EF (lb/MWh)**		
		CO2	**CH4**	**N2O**
Hydro	10.68%	0	0	0
Nuclear	0.00%	0	0	0
Renewable	89.32%	0	0	0
Non-renewable	0.00%	1015	0.070	0.008
Total	100.00%	0	0.000	0.000

	EF (lb/MWh)		
Year	**CO2**	**CH4**	**N2O**
2016	497	0.034	0.004
2017	497	0.034	0.004
2018	492	0.034	0.004
2019	488	0.034	0.004
2020	480	0.033	0.004
2021	462	0.032	0.004
2022	443	0.030	0.004
2023	425	0.029	0.003
2024	407	0.028	0.003
2025	389	0.027	0.003
2026	371	0.025	0.003
2027	352	0.024	0.003
2028	334	0.023	0.003
2029	316	0.022	0.003
2030	298	0.020	0.002
2031	278	0.019	0.002
2032	258	0.018	0.002
2033	238	0.016	0.002
2034	218	0.015	0.002
2035	198	0.014	0.002
2036	179	0.012	0.001
2037	159	0.011	0.001
2038	139	0.010	0.001
2039	119	0.008	0.001
2040	99	0.007	0.0008
2041	79	0.005	0.001
2042	60	0.004	0.000
2043	40	0.003	0.000
2044	20	0.001	0.000
2045	0	0.000	0.000

2017 PGE	**%**	**EF (lb/MWh)**
		CO2
Hydro	13.00%	0
Nuclear	34.00%	0
Renewable	39.00%	0
Non-renewable	14.00%	1500
Total	100.00%	210

2020 (RPS = 33%)	**%**	**EF (lb/MWh)**
		CO2
Hydro	13.00%	0
Nuclear	34.00%	0
Renewable	39.00%	0
Non-renewable	14.00%	1500
Total	100.00%	210

2030 (RPS = 60%)	**%**	**EF (lb/MWh)**
		CO2
Hydro	13.00%	0
Nuclear	34.00%	0
Renewable	60.00%	0
Non-renewable	0.00%	0
Total	107.00%	0

2045 (Carbon Free)	**%**	**EF (lb/MWh)**
		CO2
Hydro	0.00%	0
Nuclear	0.00%	0
Renewable	100.00%	0
Non-renewable	0.00%	0
Total	100.00%	0

	EF (lb/MWh)
Year	**CO2**
2016	-
2017	210
2018	210
2019	210
2020	210
2021	189
2022	168
2023	147
2024	126
2025	105
2026	84
2027	63
2028	42
2029	21
2030	0
2031	0
2032	0
2033	0
2034	0
2035	0
2036	0
2037	0
2038	0
2039	0
2040	0
2041	0
2042	0
2043	0
2044	0
2045	0

VMT

Existing (701 Gateway) Daily VMT	18,720
Existing (701 Gateway) Annual VMT	6,495,840
Existing (701 Gateway)Daily Trips	1,483
Existing (701 Gateway) Annual Trips	514,601
2021 (701 Gateway) Daily VMT	18,720
2021 (701 Gateway) Annual VMT	6,495,840
2021 (701 Gateway)Daily Trips	1,483
2021 (701 Gateway) Annual Trips	514,601
2021 (751 Gateway) Daily VMT	30,410
2021 (751 Gateway) Annual VMT	10,552,131
2021 (751 Gateway) Daily Trips	1,784
2021 (751 Gateway) Annual Trips	619,048

Source: Hawkins, Fehr & Peers (3/13/20)

2021 (751 Gateway) Daily Trips include 1,784 mobile trips and 23 daily delivery trips

		Pounds/Day					Metric Tons/Year			
Running Emissions (VMT)		*2*	*5*			*4*	*6*	*7*	*13*	
		ROG	NOx	Total PM10	Total PM2.5	CO	CO2	CH4	N20	CO2e
2019	Existing (701 Gateway)	2	9	36	9	41	2,325	0	0	2,354
2021	701 Gateway	1	7	36	9	34	2,224	0	0	2,250
2021	731 Gateway	2	11	59	15	56	3,613	0	0	3,655

		Pounds/Day					Metric Tons/Year			
Proces Emissions (Trips)		*14*	*17*	*20*	*21*	*16*	*18*	*19*	*23*	
Year	Condition	ROG	NOx	PM10	PM2.5	CO	CO2	CH4	N20	CO2e
2019	Existing (701 Gateway)	0	0	0	0	1	5	0	0	6
2021	701 Gateway	0	0	0	0	1	5	0	0	6
2021	731 Gateway	1	0	0	0	2	6	0	0	7

		Pounds/Day					Metric Tons/Year				Fuel (Gallons/Year)	
Year	Condition	ROG	NOx	PM10	PM2.5	CO	CO2	CH4	N20	CO2e	Gasoline	Diesel
2019	Existing (701 Gateway)	2	9	36	9	42	2,331	0	0	2,360	243,226	28,680
2021	701 Gateway	2	7	36	9	36	2,229	0	0	2,256	230,099	29,500
2021	731 Gateway	3	12	59	15	58	3,619	0	0	3,662	373,783	47,921
Net Change From Existing		3	10	59	15	51	3,517	0	0	3,559	360,655	48,741

Emission Factors - Fleet Average (Adjusted for SAFE Vehicle Rule Part 1)

	Running (RUNEX, PMTW, PMBW) grams per mile												Process (IDLEX, STREX, TOTEX, DIURN, HTSK, RUNLS, RESTL) grams per trip									
	ROG	TOG	CO	NOx	CO2	CH4	PM10 Ex	PM10 D	PM2.5 Ex	PM2.5 D	SOX	N2O	ROG	TOG	CO	NOx	CO2	CH4	PM10	PM2.5	SOX	N2O
2019	0.04	0.06	0.99	0.22	357.99	0.01	0.00	0.87	0.00	0.22	0.00	0.01	0.15	0.15	0.42	0.06	9.91	0.01	0.00	0.00	0.00	0.01
2021	0.04	0.05	0.83	0.17	342.37	0.01	0.00	0.87	0.00	0.22	0.00	0.01	0.13	0.14	0.42	0.06	9.99	0.01	0.00	0.00	0.00	0.00

		gal/mile
2019	GAS	0.03744
2019	DSL	0.00442
2021	GAS	0.03542
2021	DSL	0.00454

Source: EMFAC2017, Adjusted for SAFE Rule Part 1

Technical Modeling Considerations for Criteria Pollutants and Human Health Effects

In their interim guidance addressing *Sierra Club v. County of Fresno* (6 Cal. 5th 502) (Friant Ranch), SMAQMD (2019) recommends lead agencies compare the air quality models used in CEQA analyses to those models designed to evaluate regional attainment with ambient air quality standards and associated human health consequences. This section describes the three models used to estimate criteria pollutant emissions generated by construction and operation of the project and evaluates their ability to assess specific health impacts of the project. This section also analyzes whether models and tools that have been developed to quantify ambient pollutant concentrations could be used to reasonably correlate project-level emissions to specific health consequences.

Review of Project Analysis Models

Criteria pollutant emissions generated by construction and operation of the project were estimated using the California Emissions Estimator Model (CalEEMod), SMAQMD's Roadway Construction Emissions Model (RCEM), and the California Air Resources Board's (CARB) EMissions FACtor (EMFAC) model. Each of the following sections note whether the given model is suitable for quantify human health consequences or changes in nonattainment days.

California Emissions Estimator Model

CalEEMod is a statewide computer model quantifies construction and operational criteria pollutant and greenhouse gas (GHG) emissions from land use development projects. The model evaluates construction emissions associated with six phases—demolition, site preparation, grading, building construction, architectural coatings, and paving. Emission sources considered by the model include offroad construction equipment, onroad mobile vehicles, fugitive dust from land disturbance, and volatile organic compounds from architectural coatings and paving activities.

CalEEMod quantifies project emissions based on user-defined inputs for project location, operational year, land use type (e.g., commercial), climate zone, and size. Based on these minimum data inputs, users can estimate construction emissions based model generated default assumptions for construction phasing, construction equipment inventory and activities, and trip lengths. Default values included in the model were provided by California air districts and account for local conditions and regulations. Where appropriate, CalEEMod combines local data with regional and statewide values to ensure enough information is available to quantify emissions. Users can override default values with project-specific information. In addition, users can implement mitigation measures and strategies to reduce construction-related exhaust and fugitive dust emissions.

Based on the user inputs and emission factors from the CARB's EMFAC and OFFROAD models, CalEEMod calculates both daily maximum (pounds per day) and annual average (tons per year) emissions. These emissions can be compared to air district mass emission thresholds, such as those adopted by EDCAQMD. CalEEMod does not quantify concentrations of the various air pollutants (in terms of micrograms per cubic meter or parts per million), nor does it estimate secondary pollutants (such as ozone and PM2.5) or potential human health effects from exposure to criteria pollutants. Accordingly, CalEEMod cannot be used to evaluate changes in the number of regional nonattainment days or correlate project-level emissions to specific health consequences.

Road Construction Emissions Model

SMAQMD's RCEM is a public-domain spreadsheet model formatted as a series of individual worksheets. The model is specifically designed to evaluate construction criteria pollutant and GHG emissions from linear projects (e.g., water infrastructure, roads). Four generic construction phases are considered by the model: 1) grubbing/land clearing, 2) grading/excavation, 3) drainage/utilities/subgrade, and 4) paving. Within these phases, the model estimates construction emissions for load hauling (onroad heavy-duty vehicle trips), worker commutes, construction site fugitive dust, and offroad construction vehicles. Although exhaust emissions are estimated for each activity, fugitive dust estimates are currently limited to major dust-generating activities, which include grubbing/land clearing and grading/excavation.

The RCEM was designed to enable users to estimate emissions using a minimum amount of project-specific information, such as construction start year and duration, project type, and the project length and area. This was done because specific data to quantify emissions from transportation projects is often unavailable when the environmental document is being prepared. To help facilitate the quantification of construction emissions based on valid assumptions, the RCEM contains default data based on surveys of construction equipment , schedules, and other construction data from a selection of construction projects in Sacramento County, as well as construction surveys conducted for CalEEMod and a technical evaluation completed by the University of California, Davis. Emission factors used by the model are from the CARB's EMFAC and OFFROAD models.

Like CalEEMod, RCEM calculates both daily maximum (pounds per day) and annual average (tons per year) emissions. RCEM does not quantify concentrations of the various air pollutants (in terms of micrograms per cubic meter or parts per million), nor does it estimate secondary pollutants (such as ozone and PM2.5) or potential human health effects from exposure to criteria pollutants. Accordingly, RCEM cannot be used to evaluate changes in the number of regional nonattainment days or correlate project-level emissions to specific health consequences.

EMissions FACtor Model

CARB developed the EMFAC model to facilitate preparation of statewide and regional mobile source emissions inventories. The model generates criteria pollutant and GHG emissions rates that can be multiplied by vehicle activity data from all motor vehicles, including passenger cars to heavy-duty trucks, operating on highways, freeways, and local roads in California. The resulting emissions estimates are mass emission quantities that can be expressed in terms of pounds per day and tons per year (or other similar unit rates). Like CalEEMod and RCEM, EMFAC does not assess pollutant dispersion or quantify concentrations or potential health effects. Accordingly, EMFAC cannot be used to evaluate changes in the number of regional nonattainment days or correlate project-level emissions to specific health consequences.

Review of Photochemical and Human Health Models

Several models and tools capable of translating mass emissions of criteria pollutants to ambient pollutant concentrations and various health endpoints have been developed. Table 1 summarizes key tools, identifies the analyzed pollutants, describes their intended application and resolution, and analyzes whether they could be used to reasonably correlate project-level emissions to specific health consequences.

As shown in Table 1, almost all tools were designed to be used at the national, state, regional, and/or city-levels. This is because criteria pollutants emitted by a specific source often do not deposit immediately adjacent to that source. Pollutants can be transported by prevailing winds or transformed through chemical reactions and physical interactions with other pollutants in the atmosphere. Because some pollutants can be transported over long distances, recorded violations of the ambient air quality standards at a specific monitoring station and resultant health effects experienced by the local population may be the result of faraway emission sources (some of which may not even be located within the same air basin). For this reason, attaining the ambient air quality standards and protecting human health from exposure to criteria pollutants requires a regional, and sometimes multiregional strategy that considers the combined effect of all emission-generating sources that influence air quality within an air basin.

The models and tools that have been developed to assess attainment of the ambient air quality standards and human health effects are therefore regional in nature and are not well suited to analyze small or localized changes in pollutant concentrations associated with individual projects. Said another way, “it remains impossible, using today’s models, to correlate that increase in concentration to a specific health impact [because] such models are designed to determine regional, population-wide health impacts, and simply are not accurate when applied at the local level” (San Joaquin Valley Air Pollution Control District 2015). As of the writing of this analysis “neither the Sac Metro Air District nor any other air district currently have methodologies that would provide Lead Agencies and CEQA practitioners with a consistent, reliable, and meaningful analysis to correlate specific health impacts that may result from a proposed project’s mass emissions” (Sacramento Metropolitan Air Quality Management District 2019).

Table 1. Analysis of Photochemical and Human Health Models

Tool	Created by	Description	Resolution	Pollutants Analyzed	Project-Level CEQA Applicability
AirCounts	Abt Assoc.	Online tool that helps large and medium-sized cities quickly estimate the health benefits of PM2.5 emission reductions and economic value of those benefits. The tool estimates the number of deaths (mortality) avoided and economic value related to user-specified regional, annual PM2.5 emissions reduction. The modeling year is 2010; avoided deaths are expected to occur over a 20-year period and their present value is shown in 2010 US dollars at a 3% discount rate.	City-level	Primary PM2.5	This tool is only illustrative, as it is limited to certain cities and does not target specific sectors. Given that it was designed as a screening-level tool, is not sector specific, and includes limited California data, the tool is **not recommended** for project-level CEQA analysis.
AP2 (formerly Air Pollution Emission Experiments and Policy [APEEP])	Mueller and Mendelsohn, 2006	AP2 is an integrated assessment model developed to assess marginal damage impacts from emissions at the national scale but can be applied at the county-level. The model connects emissions to monetary damages through six modules: emissions (per EPA's national inventory), air quality modeling, concentrations, exposures, physical effects, and valuation. Damages are presented on a dollar-per-ton basis. Model extends damage assessment beyond human health, and includes assessment on reduced crop and timber yields, reductions in visibility, enhanced depreciation of man-made materials and damages due to lost recreation services.	National or county-level	SO_2, ROG, NOx, ozone, PM2.5, PM10	The model operates at the national scale but may be applied at the county-level (although it is not clear how this adjustment should be made). The tool is also not commercially available. Accordingly, the tool is **not recommended** for project-level CEQA analysis.
Methodology for Estimating Premature Deaths Associated with Long-Term Exposure to Fine Airborne Particulate Matter in California	CARB	The staff report identifies a relative risk of premature death associated with PM2.5 exposure based on a review of all relevant scientific literature, and a new relative risk factor was developed. This new factor is a 10% increase in risk of premature death per 10 $\mu g/m^3$ increase in exposure to PM2.5 concentrations (uncertainty interval: 3% to 20%)	National		The primary author of the CARB staff report notes that the analysis method is not suited for small projects and may yield unreliable results due to various uncertainties. Accordingly, the tool is **not recommended** for project-level CEQA analysis.
Co-Benefits Risk Assessment (COBRA)	US EPA	Preliminary screening tool that contains baseline emission estimates of a variety of air pollutants for a single year (2017). COOBRA is targeted to state and local governments as a screening assessment for clean energy policies. Users specify changes to the baseline emission estimates. COBRA then uses "canned" source-receptor matrix model to estimate PM changes and resulting health outcomes and monetized values. The results can be mapped to visually represent air quality, human health, and health-related economic benefits. Analysis can be performed across the 14 major emissions categories included in the EPA's National Emissions Inventory. Note that COBRA is based on EPA's BenMAP-CE (discussed in a separate entry).	National, regional, state, or county-levels	PM2.5, SO_2, NOx, NH_3, and ROG	COBRA is a preliminary screening tool only and cannot be used at sub-county resolution. It also does not account for secondary emission changes resulting from market responses. Accordingly, the tool is **not recommended** for project-level CEQA analysis.
Environmental Benefits and Mapping Program-Community Edition (BenMAP-CE)	US EPA	BenMAP is EPA's detailed model for estimating the health impacts from air pollution. It relies on input concentrations and applies concentration-response (C-R) health impact functions, which relate a change in the concentration of a pollutant with a change in the incidence of a health endpoint, including premature mortality, heart attacks, chronic respiratory illnesses, asthma exacerbation and other adverse health effects. Detailed inputs are required for air quality changes (concentrations from AERMOD), population, baseline incidence rates, and effect estimates.	National, County, City, and sub-regional levels	Ozone, PM, NO_2, SO_2, CO	The smallest default analysis resolution for BenMAP-CE is 144 square kilometers (equivalent to approximately 56 square miles or 36,000 acres). This tool could be used to derive average health incidence/ton estimates that can be used for illustrative purposes only for most projects with proper disclosure of the inherent inaccuracies involved in averaging. It is **not recommended** for individual modeling of smaller projects, however. The tool may be appropriate for modeling certain large-scale General Plan-level analyses.

Tool	Created by	Description	Resolution	Pollutants Analyzed	Project-Level CEQA Applicability
Fast Scenario Screening Tool (TM5-FASST)	Joint Research Centre (Italy)	Tool allows users to evaluate how air pollutant emissions affect large scale pollutant concentrations and their impact on human health (mortality and years of life lost) and crop yield from national to regional air quality policies, such as climate policies. The tool is web-based and does not require coding or modelling. Users must gain access through publishers.	Global and national-levels	PM2.5, ozone, NOx, NH_3, CO, ROG, EC, CH_4, SO_2	This tool is applicable at national to global scales. Accordingly, the tool is **not recommended** for project-level CEQA analysis.
Long-range Energy Alternatives Planning System-- Integrated Benefits Calculator (LEAP-IBC)	Climate and Clean Air Coalit-ion (CCAC)	Allows users to rapidly estimate the impacts of reducing emissions on health, climate, and agriculture. Tool uses sensitivity coefficients that link gridded emissions of air pollutants and precursors to health, climate and agricultural impacts at a national level. The sensitivity coefficients are generated by a chemical transport model, so air quality modeling not necessary. Tool is currently Excel-based and is available through the developers only. A web-based interface is currently under development.	National-level	PM2.5, ozone, NO_2	This tool is applicable at national scale. Accordingly, the tool is **not recommended** for project-level CEQA analysis.
Multi-Pollutant Evaluation Method (MPEM)	BAAQMD	Estimates the impacts of control measures on pollutant concentration, population exposures, and health outcomes for criteria, toxic, and GHG pollutants. Monetizes the value of total health benefits from reductions in PM2.5, ozone, and certain carcinogens, and the social value of GHG reductions. MPEM was designed for development of a Clean Air Plan for the San Francisco Bay Area. The inputs are specific to the SF region and are not appropriate for projects outside BAAQMD.	Regional level in the SFBAAB	Ozone, PM, air toxics, GHG	This tool is designed to support the BAAQMD in regional planning and emissions analysis within the SFBAAB. The model applies changes in pollutant concentrations over a four-square kilometer grid. This tool could be used to derive average health incidence/ton estimates that can be used for illustrative purposes only for most projects with proper disclosure of the inherent inaccuracies involved in averaging. It is **not recommended** for individual modeling of smaller projects, however. The tool may be appropriate for certain large-scale planning-level analyses in the SFBAAB (with permission of BAAQMD).
Response Surface Model (RSM)-based Benefit-per-Ton Estimates	US EPA	Consists of tables reporting the monetized PM2.5-related health benefits from reducing PM2.5 precursors from certain source types nationally and for 9 US cities/regions. Applying these estimates simply involves multiplying the emissions reduction by the relevant benefit per-ton metric. The resulting value is the PM mortality risk estimate at a 3% discount rate. Note that RSM is based on EPA's BenMAP-CE (discussed in a separate entry).	National or regional (San Joaquin County only) levels	EC, SOx, VOC, NH_3, NOx	While RSM includes regional values specific to San Joaquin County, the metrics only reflect the benefits of reductions in exposure to ambient PM alone and do not include the benefits of reductions in other pollutants. The values are also dated as new sector-based BPT values are more current. Accordingly, the tool is **not recommended** for project-level CEQA analysis (even in San Joaquin County).
Sector-based Benefit-per-Ton Estimates	US EPA	Two specific sets of BPT estimates for 17 key source categories are available. Both are a reduced-form approach based on BenMAP modeling. The first are based on Fann et al. (2012) values and available from EPA's website. The second is based on updated modeling from Fann et al. (2017) and available in a Technical Support Document (TSD) from EPA. Applying these factors involves multiplying the emissions reduction (in tons) by the relevant benefit (economic value) or incidence (rates of mortality and morbidity) per-ton metric. The resulting value is the economics, mortality, and morbidity of direct and indirect PM2.5 emissions. All values are based on a national-scale study. Local values are preferred, but not available from any existing reduced form model and use of reduced form estimates for another city is unlikely to provide a better-than-national value. Use of the current values from EPA's 2018 TSD represent the most current estimate of monetized or incidence risk. Values from Lepeule et al. (2012) represent the most current estimate of mortality.	National-scale	PM2.5, SO2, NOx	Due to the complex non-linear chemistry governing ozone formation, EPA was not able to derive ozone or secondary PM BPT values. The BPT estimates provide a rough order-of-magnitude analysis of health consequences from directly-emitted PM and precursors to PM (with no secondary formation). However, the multipliers do not account for project-specific characteristics, receptor locations, or local dispersion characteristics. The resultant health effects are therefore reflective of national averages and may not be exact when applied to the project-level. Nonetheless, the estimates can be used to present an informational and scaled health risk analysis of directly-emitted PM and precursors to PM (with no secondary formation).

Summary of Health Risk Assessment for DPM and PM2.5 Emissions during Construction

	Excess Lifetime Cancer Risk (in a million)	Maximum Chronic HI	Maximum Annual Average $PM_{2.5}$ Concentration ($\mu g/m^3$)
MEIR	0.56	0.0001	0.0008
2nd Highest MEIR	0.52	0.0001	0.0007
3rd Highest MEIR	0.49	0.0001	0.0007
BAAQMD's Thresholds	10	1	0.3

Source: AQ Appendix.

Notes: $\mu g/m^3$ = micrograms per cubic meter

MEIR = maximum exposed individual receptor (all located at Gateway Peninsula)

Summary of Health Risk Assessment for DPM and PM2.5 Emissions during Operation

	Excess Lifetime Cancer Risk (in a million)	Maximum Chronic HI	Maximum Annual Average $PM_{2.5}$ Concentration ($\mu g/m^3$)
MEIR	0.1	0.000026	0.00013
BAAQMD's Thresholds	10	1	0.3

Source: AQ Appendix.

Notes: $\mu g/m^3$ = micrograms per cubic meter

MEIR = maximum exposed individual receptor

Cumlative Health Risk Assessment

Cumulative

Source	**Cancer Risk (cases per million)**	**Non-Cancer Hazard Index**	**Annual PM2.5 Concentration (µg/m3)**
Contribution from Existing Sources			
Stationary Sources	6.7	0.070	0.04
Roadway Sources	14.0	-	0.29
Rail Sources	21.6	-	0.04
Contribution from Project Construction			
Maximum Exposed Individual Receptor	0.6	0.0	0.0
Contribution from Project Operation			
Maximum Exposed Individual Receptor	0.1	0.0	0.0
Cumulative Totals			
Existing + Construction	42.8	0.07	0.37
Existing + Operation	42.4	0.07	0.37
Existing + Construction + Operation	43.0	0.07	0.37
BAAQMD Thresholds	*100*	*10*	*0.8*

Source: Appendix A.

Notes:

µg/m3 = micrograms per cubic meter

The cancer risk, chronic HI, and PM2.5 for the generator is scaled, based on the Diesel Backup Generator Distance Multiplier Tool, per the BAAQMD guidance.

Summary of Offsite Cancer and Noncancer Health Risks and PM2.5 Concentrations for the MEI
Mitigated

Receptor	Cancer Risk (per million)	Chronic HI	PM2.5 (ug/m3)
MEIR 1	0.56	0.0001	0.0008
MEIR 2	0.52	0.0001	0.0007
MEIR 3	0.49	0.0001	0.0007
Threshold	10	1.0	0.3

Receptors					Concentration	Dose	Cancer Risk	Sum of Cancer Risk		Chronic HI (max annual)	Max PM2.5 Total (ug/m3)
Rec ID	Detail	X	Y	Type	0_2	0_2	0_2	Summed Risk	Cases Per Million		
Highest_DPM1	School	552928.74	4168030.85	School	6.40E-04	5.26E-07	5.6E-07	6E-07	0.555	0.0001	0.0008
Highest_DPM2	School	552928.74	4168010.85	School	6.00E-04	4.93E-07	5.2E-07	5E-07	0.521	0.0001	0.0007
Highest_DPM3	School	552928.74	4167990.85	School	5.70E-04	4.68E-07	4.9E-07	5E-07	0.495	0.0001	0.0007

$$RISK_{inh\text{-}res} = DOSE_{air} \times CPF \times ASF \times ED/AT \times FAH$$

$$Dose\text{-}air = C_{air} \times \{BR/BW\} \times A \times EF \times 10^{-6}$$

SUMMARY OF DPM

ONSITE DPM - OFFROAD

Phase	2020 Start date	2020 End date	Days (2020)	DPM (tons)	DPM (grams)	2021 Start date	2021 End date	Days (2021)	DPM (tons)	DPM (grams)
Demolition	7/2/2020	8/29/2020	42	0.0011	1034.191	7/2/2020	8/29/2020	0	0.000	0.000
Site Preparation	7/2/2020	8/29/2020	42	0.0000	0.000	7/2/2020	8/29/2020	0	0.000	0.000
Grading	8/9/2020	1/2/2021	104	0.0111	10069.751	8/9/2020	1/2/2021	1	0.000	99.790
Building Construction	1/3/2021	9/13/2021	0	0	0.000	1/3/2021	9/13/2021	27	0.003	3093.500
Building Construction	4/2/2021	10/26/2021	0	0	0.000	4/2/2021	10/26/2021	147	0.000	0.000
Architectural Coating	6/10/2021	10/5/2021	0	0	0.000	6/10/2021	10/5/2021	84	0.000	308.443
Paving	9/14/2021	12/2/2021	0	0	0.000	9/14/2021	12/2/2021	58	0.000	0.000
Total	7/2/2020	12/31/2020	131	0.012	11103.941	1/1/2021	12/2/2021	240		3501.733
	7/2/2020	12/2/2021								
				0					0	

OFFSITE DPM - ONROAD TRUCKS

Phase	2020 Start date	2020 End date	Days (2020)	DPM (tons)	DPM (grams)	2021 Start date	2021 End date	Days (2021)	DPM (tons)	DPM (grams)
Demolition	7/2/2020	8/29/2020	42	0.00007	63.503	7/2/2020	8/29/2020	0	0.00000	0.000
Site Preparation	7/2/2020	8/29/2020	42	0.00000	0.000	7/2/2020	8/29/2020	0	0.00000	0.000
Grading	8/9/2020	1/2/2021	104	0.00083	752.963	8/9/2020	1/2/2021	1	0.00000	0.000
Building Construction	1/3/2021	9/13/2021	0	0	0.000	1/3/2021	9/13/2021	27	0.00020	181.437
Building Construction	4/2/2021	10/26/2021	0	0	0.000	4/2/2021	10/26/2021	147	0.00015	136.078
Architectural Coating	6/10/2021	10/5/2021	0	0	0.000	6/10/2021	10/5/2021	84	0.00009	81.647
Paving	9/14/2021	12/2/2021	0	0	0.000	9/14/2021	12/2/2021	58	0.00004	36.287
Total	7/2/2020	12/31/2020		0.001	816.466	1/1/2021	12/2/2021		0.000	435.449
				0					0	

Phase	onsite combined DPM g	days	g/d	offsite combined DPM g	days	g/d
Demolition	1034.191	42	24.624	63.503	42	1.512
Site Preparation	0.000	42	0.000	0.000	42	0.000
Grading	10169.541	105	96.853	752.963	105	7.171
Building Construction	3093.500	27	114.574	181.437	27	6.720
Building Construction	0.000	147	0.000	136.078	147	0.926
Architectural Coating	308.443	84	3.672	81.647	84	0.972
Paving	0.000	58	0.000	36.287	58	0.626
Total	14605.674	505	28.922	1251.915	505	2.479

seconds/hour	3600
work hours/day	10
seconds per work day	36000

ONSITE

Phase	Start date	End date	days	Days in Bin per OEHHA 3rd tri	0<2	2-9	g/day	total g 3rd tri	0<2	2-9	g/sec 3rd tri	0<2	2-9	g/sec-m2 3rd tri	0<2	2-9		days sum
Demolition	7/2/2020	8/29/2020	42	0	42	0	25	0	1034	0	0.00000	0.00068	0.00000	0.00000000	0.00000003	0.00000000	0	42
Site Preparation	7/2/2020	8/29/2020	42	0	42	0	0	0	0	0	0.00000	0.00000	0.00000	0.00000000	0.00000000	0.00000000	0	42
Grading	8/9/2020	1/2/2021	105	0	105	0	97	0	10170	0	0.00000	0.00269	0.00000	0.00000000	0.00000011	0.00000000	0	105
Building Construction	1/3/2021	9/13/2021	27	0	27	0	115	0	3093	0	0.00000	0.00318	0.00000	0.00000000	0.00000013	0.00000000	0	27
Building Construction	4/2/2021	10/26/2021	147	0	147	0	0	0	0	0	0.00000	0.00000	0.00000	0.00000000	0.00000000	0.00000000	0	147
Architectural Coating	6/10/2021	10/5/2021	84	0	84	0	4	0	308	0	0.00000	0.00010	0.00000	0.00000000	0.00000000	0.00000000	0	84
Paving	9/14/2021	12/2/2021	58	0	58	0	0	0	0	0	0.00000	0.00000	0.00000	0.00000000	0.00000000	0.00000000	0	58
																	0	
Total					371			0	14606	0	#DIV/0!	1.09E-03	0.00000	#DIV/0!	4.31E-08	0.00000000		505
			max per oehha		730													
			range of days		7/2/2020													
					12/2/2021													
					518													

ONROAD

Phase	Total trips in Caleemod Vendor	Haul	caleemd trip length Vendor	Haul	Caleemod avg trip length	Aermod avg trip length	VMT scalar
Demolition	252	20	7.3	20	8.2	0.557804747	0.068
Site Preparation	0	0	7.3	20	#DIV/0!	0.557804747	#DIV/0!
Grading	1365	500	7.3	40	16.1	0.557804747	0.035
Building Construction	216	0	7.3	20	7.3	0.557804747	0.076
Building Construction	1323	0	7.3	20	7	0.557804747	0.076
Architectural Coating	756	0	7.3	20	7	0.557804747	0.076
Paving	348	20	7.3	20	8	0.557804747	0.070

<-- using this to scale onroad DPM for each phase

Phase	Start date	End date	days	Days in Bin per OEHHA 3rd tri	0<2	2-9	g/day, caeelmod	g/day, aermod	total g 3rd tri	0<2	2-9	g/sec 3rd tri	0<2	2-9	g/sec-m2 3rd tri	0<2	2-9	
Demolition	7/2/2020	8/29/2020	42	0	42	0	1.512	0.102	0	4	0	0.000000	0.000003	0.000000	0.00000000	0.00000000	0.00000000	0
Site Preparation	7/2/2020	8/29/2020	42	0	42	0	0.000	0.000	0	0	0	0.000000	0.000000	0.000000	0.00000000	0.00000000	0.00000000	#DIV/0!
Grading	8/9/2020	1/2/2021	105	0	105	0	7.171	0.249	0	26	0	0.000000	0.000007	0.000000	0.00000000	0.00000000	0.00000000	0
Building Construction	1/3/2021	9/13/2021	27	0	27	0	6.720	0.513	0	14	0	0.000000	0.000014	0.000000	0.00000000	0.00000000	0.00000000	0
Building Construction	4/2/2021	10/26/2021	147	0	147	0	0.926	0.071	0	10	0	0.000000	0.000002	0.000000	0.00000000	0.00000000	0.00000000	0
Architectural Coating	6/10/2021	10/5/2021	84	0	84	0	0.972	0.074	0	6	0	0.000000	0.000002	0.000000	0.00000000	0.00000000	0.00000000	0
Paving	9/14/2021	12/2/2021	58	0	58	0	0.626	0.044	0	3	0	0.000000	0.000001	0.000000	0.00000000	0.00000000	0.00000000	0
Total				0	371	0	17.926	1.054	0	63	0	#DIV/0!	0.0000048	#DIV/0!	#DIV/0!	0.00000000	#DIV/0!	

DPM SUMMARY (g/sec/m2)

Source	3rd tri	0<2	2-9
ONSITE	0.00E+00	4.31E-08	0.00E+00
OFFSITE	0.00E+00	2.09E-10	0.00E+00

ASSUMPTIONS

	onsite	offsite	
Area Project Site	25,356.30	22692.434	m2
AERMOD segment	897.7	meters	
meters to mile	0.000621371		

SUMMARY OF Exhaust

ONSITE Exhaust - OFFROAD

Phase	2020 Start date	2020 End date	Days (2020)	2020 Exhaust (tons)	2020 Exhaust (grams)	2021 Start date	2021 End date	Days (2021)	2021 Exhaust (tons)	2021 Exhaust (grams)
Demolition	7/2/2020	8/29/2020	42	0.0011	1034.191	7/2/2020	8/29/2020	0	0.000	0.000
Site Preparation	7/2/2020	8/29/2020	42	0.0000	0.000	7/2/2020	8/29/2020	0	0.000	0.000
Grading	8/9/2020	1/2/2021	104	0.0111	10069.751	8/9/2020	1/2/2021	1	0.000	99.790
Building Construction	1/3/2021	9/13/2021	0	0	0.000	1/3/2021	9/13/2021	27	0.003	3093.500
Building Construction	4/2/2021	10/26/2021	0	0	0.000	4/2/2021	10/26/2021	147	0.000	0.000
Architectural Coating	6/10/2021	10/5/2021	0	0	0.000	6/10/2021	10/5/2021	84	0.000	308.443
Paving	9/14/2021	12/2/2021	0	0	0.000	9/14/2021	12/2/2021	58	0.000	0.000
Total	7/2/2020	12/31/2020	131	0.012	11103.941	1/1/2021	12/2/2021	240		3501.733
	7/2/2020	12/2/2021								
				0					0	

OFFSITE Exhaust - ONROAD TRUCKS

Phase	2020 Start date	2020 End date	Days (2020)	2020 Exhaust (tons)	2020 Exhaust (grams)	2021 Start date	2021 End date	Days (2021)	2021 Exhaust (tons)	2021 Exhaust (grams)
Demolition	7/2/2020	8/29/2020	42	0.00011	99.790	7/2/2020	8/29/2020	0	0.00000	0.000
Site Preparation	7/2/2020	8/29/2020	42	0.00000	0.000	7/2/2020	8/29/2020	0	0.00000	0.000
Grading	8/9/2020	1/2/2021	104	0.00100	907.185	8/9/2020	1/2/2021	1	0.00000	0.000
Building Construction	1/3/2021	9/13/2021	0	0	0.000	1/3/2021	9/13/2021	27	0.00087	789.251
Building Construction	4/2/2021	10/26/2021	0	0	0.000	4/2/2021	10/26/2021	147	0.00038	344.730
Architectural Coating	6/10/2021	10/5/2021	0	0	0.000	6/10/2021	10/5/2021	84	0.00011	99.790
Paving	9/14/2021	12/2/2021	0	0	0.000	9/14/2021	12/2/2021	58	0.00027	244.940
Total	7/2/2020	12/31/2020		0.001	1006.975	1/1/2021	12/2/2021		0.002	1478.711
				0					0	

Phase	onsite combined Exhaust g	onsite combined days	onsite combined g/d	offsite combined Exhaust g	offsite combined days	offsite combined g/d
Demolition	1034.191	42	24.624	99.790	42	2.376
Site Preparation	0.000	42	0.000	0.000	42	0.000
Grading	10169.541	105	96.853	907.185	105	8.640
Building Construction	3093.500	27	114.574	789.251	27	29.232
Building Construction	0.000	147	0.000	344.730	147	2.345
Architectural Coating	308.443	84	3.672	99.790	84	1.188
Paving	0.000	58	0.000	244.940	58	4.223
Total	14605.674	505	28.922	2485.686	505	4.922

seconds/hour	3600
work hours/day	10
seconds per work day	36000

ONSITE

Phase	Start date	End date	days	Days in Bin per OEHHA 3rd tri	0<2	2-9	g/day	total g 3rd tri	0<2	2-9	g/sec 3rd tri	0<2	2-9	g/sec-m2 3rd tri	0<2	2-9		days sum
Demolition	7/2/2020	8/29/2020	42	0	42	0	25	0	1034	0	0.00000	0.00068	0.00000	0.00000000	0.00000003	0.00000000	0	42
Site Preparation	7/2/2020	8/29/2020	42	0	42	0	0	0	0	0	0.00000	0.00000	0.00000	0.00000000	0.00000000	0.00000000	0	42
Grading	8/9/2020	1/2/2021	105	0	105	0	97	0	10170	0	0.00000	0.00269	0.00000	0.00000000	0.00000011	0.00000000	0	105
Building Construction	1/3/2021	9/13/2021	27	0	27	0	115	0	3093	0	0.00000	0.00318	0.00000	0.00000000	0.00000013	0.00000000	0	27
Building Construction	4/2/2021	10/26/2021	147	0	147	0	0	0	0	0	0.00000	0.00000	0.00000	0.00000000	0.00000000	0.00000000	0	147
Architectural Coating	6/10/2021	10/5/2021	84	0	84	0	4	0	308	0	0.00000	0.00010	0.00000	0.00000000	0.00000000	0.00000000	0	84
Paving	9/14/2021	12/2/2021	58	0	58	0	0	0	0	0	0.00000	0.00000	0.00000	0.00000000	0.00000000	0.00000000	0	58
																	0	
Total					371			0	14606	0	#DIV/0!	1.09E-03	0.00000	#DIV/0!	4.31E-08	0.00000000		505
			max per oehha		730													
			range of days		7/2/2020													
					12/2/2021													
					518													

ONROAD

Phase	Total trips in Caleemod Vendor	Haul	caleemd trip length Vendor	Haul	Caleemod avg trip length	Aermod avg trip length	VMT scalar
Demolition	252	20	7.3	20	8.2	0.557804747	0.068
Site Preparation	0	0	7.3	20	#DIV/0!	0.557804747	#DIV/0!
Grading	1365	500	7.3	40	16.1	0.557804747	0.035
Building Construction	216	0	7.3	20	7.3	0.557804747	0.076
Building Construction	1323	0	7.3	20	7	0.557804747	0.076
Architectural Coating	756	0	7.3	20	7	0.557804747	0.076
Paving	348	20	7.3	20	8	0.557804747	0.070

<-- using this to scale onroad DPM for each phase

Phase	Start date	End date	days	Days in Bin per OEHHA 3rd tri	0<2	2-9	g/day, caeelmod	g/day, aermod	total g 3rd tri	0<2	2-9	g/sec 3rd tri	0<2	2-9	g/sec-m2 3rd tri	0<2	2-9	
Demolition	7/2/2020	8/29/2020	42	0	42	0	2.376	0.161	0	7	0	0.000000	0.000004	0.000000	0.00000000	0.00000000	0.00000000	0
Site Preparation	7/2/2020	8/29/2020	42	0	42	0	0.000	0.000	0	0	0	0.000000	0.000000	0.000000	0.00000000	0.00000000	0.00000000	#DIV/0!
Grading	8/9/2020	1/2/2021	105	0	105	0	8.640	0.300	0	31	0	0.000000	0.000008	0.000000	0.00000000	0.00000000	0.00000000	0
Building Construction	1/3/2021	9/13/2021	27	0	27	0	29.232	2.234	0	60	0	0.000000	0.000062	0.000000	0.00000000	0.00000000	0.00000000	0
Building Construction	4/2/2021	10/26/2021	147	0	147	0	2.345	0.179	0	26	0	0.000000	0.000005	0.000000	0.00000000	0.00000000	0.00000000	0
Architectural Coating	6/10/2021	10/5/2021	84	0	84	0	1.188	0.091	0	8	0	0.000000	0.000003	0.000000	0.00000000	0.00000000	0.00000000	0
Paving	9/14/2021	12/2/2021	58	0	58	0	4.223	0.295	0	17	0	0.000000	0.000008	0.000000	0.00000000	0.00000000	0.00000000	0
Total				0	371	0	48.004	3.259	0	150	0	#DIV/0!	0.0000112	#DIV/0!	#DIV/0!	0.00000000	#DIV/0!	

DPM SUMMARY (g/sec/m2)

Source	3rd tri	0<2	2-9
ONSITE	0.00E+00	4.31E-08	0.00E+00
OFFSITE	0.00E+00	4.94E-10	0.00E+00

ASSUMPTIONS

	onsite	offsite	
Area Project Site	25,356.30	22692.434	m2
AERMOD segment	897.7	meters	
meters to mile	0.000621371		

SUMMARY OF Dust

ONSITE Dust - OFFROAD

Phase	2020 Start date	2020 End date	Days (2020)	Dust (tons)	Dust (grams)	2021 Start date	2021 End date	Days (2021)	Dust (tons)	Dust (grams)
Demolition	7/2/2020	8/29/2020	42	0.0001	99.790	7/2/2020	8/29/2020	0	0.000	0.000
Site Preparation	7/2/2020	8/29/2020	42	0.0002	172.365	7/2/2020	8/29/2020	0	0.000	0.000
Grading	8/9/2020	1/2/2021	104	0.0000	0.000	8/9/2020	1/2/2021	1	0.000	0.000
Building Construction	1/3/2021	9/13/2021	0	0	0.000	1/3/2021	9/13/2021	27	0.000	0.000
Building Construction	4/2/2021	10/26/2021	0	0	0.000	4/2/2021	10/26/2021	147	0.000	0.000
Architectural Coating	6/10/2021	10/5/2021	0	0	0.000	6/10/2021	10/5/2021	84	0.000	0.000
Paving	9/14/2021	12/2/2021	0	0	0.000	9/14/2021	12/2/2021	58	0.000	0.000
Total	7/2/2020	12/31/2020	131	0.000	272.155	1/1/2021	12/2/2021	240		0.000
	7/2/2020	12/2/2021								
				0					0	

OFFSITE Dust - ONROAD TRUCKS

Phase	2020 Start date	2020 End date	Days (2020)	Dust (tons)	Dust (grams)	2021 Start date	2021 End date	Days (2021)	Dust (tons)	Dust (grams)
Demolition	7/2/2020	8/29/2020	42	0.00200	1814.369	7/2/2020	8/29/2020	0	0.00000	0.000
Site Preparation	7/2/2020	8/29/2020	42	0.00000	0.000	7/2/2020	8/29/2020	0	0.00000	0.000
Grading	8/9/2020	1/2/2021	104	0.01120	10160.469	8/9/2020	1/2/2021	1	0.00163	1478.711
Building Construction	1/3/2021	9/13/2021	0	0	0.000	1/3/2021	9/13/2021	27	0.03350	30390.689
Building Construction	4/2/2021	10/26/2021	0	0	0.000	4/2/2021	10/26/2021	147	0.01210	10976.935
Architectural Coating	6/10/2021	10/5/2021	0	0	0.000	6/10/2021	10/5/2021	84	0.00159	1442.424
Paving	9/14/2021	12/2/2021	0	0	0.000	9/14/2021	12/2/2021	58	0.01130	10251.188
Total	7/2/2020	12/31/2020		0.013	11974.839	1/1/2021	12/2/2021		0.060	54539.947
				0					0	

Phase	onsite combined Dust g	days	g/d	offsite combined Dust g	days	g/d
Demolition	99.790	42	2.376	1814.369	42	43.199
Site Preparation	172.365	42	4.104	0.000	42	0.000
Grading	0.000	105	0.000	11639.180	105	110.849
Building Construction	0.000	27	0.000	30390.689	27	1125.581
Building Construction	0.000	147	0.000	10976.935	147	74.673
Architectural Coating	0.000	84	0.000	1442.424	84	17.172
Paving	0.000	58	0.000	10251.188	58	176.745
Total	272.155	505	0.539	66514.785	505	131.712

seconds/hour	3600
work hours/day	10
seconds per work day	36000

ONSITE

Phase	Start date	End date	days	Days in Bin per OEHHA 3rd tri	0<2	2-9	g/day	total g 3rd tri	0<2	2-9
Demolition	7/2/2020	8/29/2020	42	0	42	0	2	0	100	0
Site Preparation	7/2/2020	8/29/2020	42	0	42	0	4	0	172	0
Grading	8/9/2020	1/2/2021	105	0	105	0	0	0	0	0
Building Construction	1/3/2021	9/13/2021	27	0	27	0	0	0	0	0
Building Construction	4/2/2021	10/26/2021	147	0	147	0	0	0	0	0
Architectural Coating	6/10/2021	10/5/2021	84	0	84	0	0	0	0	0
Paving	9/14/2021	12/2/2021	58	0	58	0	0	0	0	0
Total					371			0	272	0
			max per oehha		730					
			range of days		7/2/2020					
					12/2/2021					
					518					

Phase	g/sec 3rd tri	0<2	2-9	g/sec-m2 3rd tri	0<2	2-9		days sum
Demolition	0.00000	0.00007	0.00000	0.00000000	0.00000000	0.00000000	0	42
Site Preparation	0.00000	0.00011	0.00000	0.00000000	0.00000000	0.00000000	0	42
Grading	0.00000	0.00000	0.00000	0.00000000	0.00000000	0.00000000	0	105
Building Construction	0.00000	0.00000	0.00000	0.00000000	0.00000000	0.00000000	0	27
Building Construction	0.00000	0.00000	0.00000	0.00000000	0.00000000	0.00000000	0	147
Architectural Coating	0.00000	0.00000	0.00000	0.00000000	0.00000000	0.00000000	0	84
Paving	0.00000	0.00000	0.00000	0.00000000	0.00000000	0.00000000	0	58
							0	
Total	#DIV/0!	2.04E-05	0.00000	#DIV/0!	8.04E-10	0.00000000		505

ONROAD

Phase	Total trips in Caleemod Vendor	Haul	caleemd trip length Vendor	Haul	Caleemod avg trip length	Aermod avg trip length	VMT scalar
Demolition	252	20	7.3	20	8.2	0.557804747	0.068
Site Preparation	0	0	7.3	20	#DIV/0!	0.557804747	#DIV/0!
Grading	1365	500	7.3	40	16.1	0.557804747	0.035
Building Construction	216	0	7.3	20	7.3	0.557804747	0.076
Building Construction	1323	0	7.3	20	7	0.557804747	0.076
Architectural Coating	756	0	7.3	20	7	0.557804747	0.076
Paving	348	20	7.3	20	8	0.557804747	0.070

<-- using this to scale onroad DPM for each phase

Phase	Start date	End date	days	Days in Bin per OEHHA 3rd tri	0<2	2-9	g/day, caeelmod	g/day, aermod	total g 3rd tri	0<2	2-9
Demolition	7/2/2020	8/29/2020	42	0	42	0	43.199	2.927	0	123	0
Site Preparation	7/2/2020	8/29/2020	42	0	42	0	0.000	0.000	0	0	0
Grading	8/9/2020	1/2/2021	105	0	105	0	110.849	3.848	0	404	0
Building Construction	1/3/2021	9/13/2021	27	0	27	0	1125.581	86.007	0	2322	0
Building Construction	4/2/2021	10/26/2021	147	0	147	0	74.673	5.706	0	839	0
Architectural Coating	6/10/2021	10/5/2021	84	0	84	0	17.172	1.312	0	110	0
Paving	9/14/2021	12/2/2021	58	0	58	0	176.745	12.339	0	716	0
Total				0	371	0	1548.219	112.139	0	4514	0

Phase	g/sec 3rd tri	0<2	2-9	g/sec-m2 3rd tri	0<2	2-9	
Demolition	0.000000	0.000081	0.000000	0.00000000	0.00000000	0.00000000	0
Site Preparation	0.000000	0.000000	0.000000	0.00000000	0.00000000	0.00000000	#DIV/0!
Grading	0.000000	0.000107	0.000000	0.00000000	0.00000000	0.00000000	0
Building Construction	0.000000	0.002389	0.000000	0.00000000	0.00000011	0.00000000	0
Building Construction	0.000000	0.000158	0.000000	0.00000000	0.00000001	0.00000000	0
Architectural Coating	0.000000	0.000036	0.000000	0.00000000	0.00000000	0.00000000	0
Paving	0.000000	0.000343	0.000000	0.00000000	0.00000002	0.00000000	0
Total	#DIV/0!	0.0003380	#DIV/0!	#DIV/0!	0.00000001	#DIV/0!	

DPM SUMMARY (g/sec/m2)

Source	3rd tri	0<2	2-9
ONSITE	0.00E+00	8.04E-10	0.00E+00
OFFSITE	0.00E+00	1.49E-08	0.00E+00

ASSUMPTIONS

	onsite	offsite	
Area Project Site	25,356.30	22692.434	m2
AERMOD segment	897.7	meters	
meters to mile	0.000621371		

Source Inputs			
South SF Population	67,733		
San Mateo County Population	766,573		
offroad sources			
Release Height (RH)	4.1	m	
Vertical Dimension	3.81	m	
Elevation	0	m	
onroad/truck sources			
Release Height (RH)	3.4	m	EPA PM Hostpot, Appx J
Vertical Dimension	3.16	m	CAPCOA 2009/AERMOD (RH/2.15)
Elevation	0	m	
receptor height (m)	0	Default	
Met from SFO			
PM2.5 Exhaust (Offroad+Hauling+Vendor)= DPM			
Construction	7am-5pm		

Health Risk - Dose and Risk Factors and Values

Dose factors

$$\text{Dose-air} = C_{air} \times \{BR/BW\} \times A \times EF \times 10^{-6}$$

$$\text{Dose-air} = (C_{air} \times WAF) \times \{BR/BW\} \times A \times EF \times 10^{-6}$$

		3rd trimester	0<2	2<9	2<16	16<30	16-70	source
Daily Breath Rate (BR/BW) (L/kg-day)	Residential	361	1090	631	572	261	233	OEHHA 2015, Table 5.6, 95th %ile for 3rdtri-2yrs old; 80th for other age groups
	Recreational	240	1200	640	520	240	230	OEHHA 2015, Table 5.8 (95th, moderate) for all bins but 3rd tri, which was taken from SJVAPCD's draft guidance
	School	240	1200	640	520	240	230	SJVAPCD for 3rd tri; 95th percentile for all
A		1	1	1	1	1	1	OEHHA 2015, page 5-24
EF, Exposure frequency (unitless), days/365 days	Residential	0.96	0.96	0.96	0.96	0.96	0.96	OEHHA 2015, page 5-24, 350 days/yr
	Recreational	0.285	0.285	0.285	0.285	0.285	0.285	2x/week, 2 hours/day, for 9 years
	School	0.68	0.68	0.68	0.68	0.68	0.68	5 days/week, 11.5 hours/day (Daycare)
Conversion Factor		1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	(mg/ug + m3/L)

Risk Factors

$$RISK_{inh\text{-}res} = DOSE_{air} \times CPF \times ASF \times ED/AT \times FAH$$

		3rd trimester	0<2	2<9	2<16	16<30	16-70	source
CPF, DPM ([mg/kg-day]$^{-1}$)		1.1	1.1	1.1	1.1	1.1	1.1	OEHHA 2015, Table 7.1
Average Age Sensitivity Factor		10	10	3	3	1	1	OEHHA 2015, Table 8.3
AT, Average Time (days)		70	70	70	70	70	70	Averaging time for lifetime cancer risk
FAH		1.00	1.00	1.00	1.00	1.00	1.00	OEHHA 2015, Table 8.4: Use FAH = 1 if a school is within the 1×10-6 (or greater) cancer risk isopleth
ED, Exposure Duration (years)		-	2	-	-	-	-	Equation 8.2.4 A, OEHHA 2015; Gateway School
Adjustment Factor	Residential	1.00	1.00	1.00	1.00	1.00	1.00	OEHHA 2015, Page 4-44 and Equation 4.1; exposure is adjusted upward to account for overlapping daytime exposure.
	Recreational	3.36	3.36	3.36	3.36	3.36	3.36	
	School	3.36	3.36	3.36	3.36	3.36	3.36	

Hazard Index

Chronic Inhalation Reference Exposure Level, respiratory, DPM	5	OEHHA 2015, Table 6.3

```
* AERMOD ( 19191):
C:\USERS\35578\DESKTOP\751_GATEWAY_HRA_DPM\751_GATEWAY_HRA_DPM.ISC
07/23/20
* AERMET ( 14134):
12:05:56
* MODELING OPTIONS USED:   NonDFAULT  CONC  ELEV  FASTAREA  URBAN
*         PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS   5 YEARS FOR
SOURCE GROUP: ALL
*         FOR A TOTAL OF     7 RECEPTORS.
*         FORMAT: (3(1X,F13.5),3(1X,F8.2),2X,A6,2X,A8,2X,I8.8,2X,A8)
*        X             Y      AVERAGE CONC    ZELEV    ZHILL    ZFLAG
AVE     GRP      NUM YRS   NET ID
* ____________  ____________  ____________   ______   ______   ______
______  ________  ________  ________
  552888.74000 4167990.85000       0.00045     8.89   125.64     0.00
ANNUAL  ALL      00000005
  552928.74000 4167990.85000       0.00057     7.73   125.64     0.00
ANNUAL  ALL      00000005
  552888.74000 4168010.85000       0.00047     8.48   125.64     0.00
ANNUAL  ALL      00000005
  552908.74000 4168010.85000       0.00053     8.85   125.64     0.00
ANNUAL  ALL      00000005
  552928.74000 4168010.85000       0.00060     8.95   125.64     0.00
ANNUAL  ALL      00000005
  552908.74000 4168030.85000       0.00056     8.91   125.64     0.00
ANNUAL  ALL      00000005
  552928.74000 4168030.85000       0.00064     8.77   125.64     0.00
ANNUAL  ALL      00000005
** CONCUNIT ug/m^3
** DEPUNIT g/m^2
** CONCUNIT ug/m^3
** DEPUNIT g/m^2
```

```
* AERMOD ( 19191): C:\USERS\35578\DESKTOP\751_GATEWAY_HRA_EXHAUST
\751_GATEWAY_HRA_EXHAU     07/23/20
* AERMET ( 14134):
12:21:43
* MODELING OPTIONS USED:   NonDFAULT  CONC  ELEV  FASTAREA  URBAN
*         PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS   5 YEARS
FOR SOURCE GROUP: ALL
*         FOR A TOTAL OF     7 RECEPTORS.
*         FORMAT:
(3(1X,F13.5),3(1X,F8.2),2X,A6,2X,A8,2X,I8.8,2X,A8)
*        X             Y      AVERAGE CONC    ZELEV    ZHILL
ZFLAG    AVE     GRP      NUM YRS   NET ID
* ____________  ____________  ____________   ______   ______
______  ______  ________  ________  ________
  552888.74000 4167990.85000       0.00010     8.89   125.64
0.00  ANNUAL  ALL       00000005
  552928.74000 4167990.85000       0.00011     7.73   125.64
0.00  ANNUAL  ALL       00000005
  552888.74000 4168010.85000       0.00010     8.48   125.64
0.00  ANNUAL  ALL       00000005
  552908.74000 4168010.85000       0.00011     8.85   125.64
0.00  ANNUAL  ALL       00000005
  552928.74000 4168010.85000       0.00012     8.95   125.64
0.00  ANNUAL  ALL       00000005
  552908.74000 4168030.85000       0.00011     8.91   125.64
0.00  ANNUAL  ALL       00000005
  552928.74000 4168030.85000       0.00012     8.77   125.64
0.00  ANNUAL  ALL       00000005
** CONCUNIT ug/m^3
** DEPUNIT g/m^2
** CONCUNIT ug/m^3
** DEPUNIT g/m^2
```

```
* AERMOD ( 19191):
C:\Users\35578\Desktop\751_Gateway_HRA_Exhaust\751_Gateway_HRA_Exhau
07/23/20
* AERMET ( 14134):
12:13:12
* MODELING OPTIONS USED:   NonDFAULT  CONC  ELEV  FASTAREA  URBAN
*         PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS   5 YEARS FOR
SOURCE GROUP: ALL
*         FOR A TOTAL OF     7 RECEPTORS.
*         FORMAT: (3(1X,F13.5),3(1X,F8.2),2X,A6,2X,A8,2X,I8.8,2X,A8)
*        X             Y      AVERAGE CONC    ZELEV    ZHILL    ZFLAG
AVE     GRP      NUM YRS   NET ID
* ____________  ____________  ____________   ______   ______   ______
______  ________  ________  ________
  552888.74000 4167990.85000       0.00045     8.89   125.64     0.00
ANNUAL  ALL      00000005
  552928.74000 4167990.85000       0.00058     7.73   125.64     0.00
ANNUAL  ALL      00000005
  552888.74000 4168010.85000       0.00047     8.48   125.64     0.00
ANNUAL  ALL      00000005
  552908.74000 4168010.85000       0.00053     8.85   125.64     0.00
ANNUAL  ALL      00000005
  552928.74000 4168010.85000       0.00061     8.95   125.64     0.00
ANNUAL  ALL      00000005
  552908.74000 4168030.85000       0.00056     8.91   125.64     0.00
ANNUAL  ALL      00000005
  552928.74000 4168030.85000       0.00064     8.77   125.64     0.00
ANNUAL  ALL      00000005
** CONCUNIT ug/m^3
** DEPUNIT g/m^2
```

```
* AERMOD ( 19191): C:\Users\35578\Desktop\751_Gateway_HRA_Exhaust
\751_Gateway_HRA_Exhau     07/23/20
* AERMET ( 14134):
13:25:13
* MODELING OPTIONS USED:   NonDFAULT  CONC  ELEV  FASTAREA  URBAN
*         PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS   5 YEARS
FOR SOURCE GROUP: ALL
*         FOR A TOTAL OF     7 RECEPTORS.
*         FORMAT:
(3(1X,F13.5),3(1X,F8.2),2X,A6,2X,A8,2X,I8.8,2X,A8)
*        X             Y      AVERAGE CONC    ZELEV    ZHILL
ZFLAG    AVE     GRP      NUM YRS   NET ID
* ____________  ____________  ____________   ______   ______
______  ______  ________  ________  ________
  552888.74000 4167990.85000       0.00011     8.89   125.64
0.00  ANNUAL  ALL       00000005
  552928.74000 4167990.85000       0.00012     7.73   125.64
0.00  ANNUAL  ALL       00000005
  552888.74000 4168010.85000       0.00011     8.48   125.64
0.00  ANNUAL  ALL       00000005
  552908.74000 4168010.85000       0.00012     8.85   125.64
0.00  ANNUAL  ALL       00000005
  552928.74000 4168010.85000       0.00013     8.95   125.64
0.00  ANNUAL  ALL       00000005
  552908.74000 4168030.85000       0.00012     8.91   125.64
0.00  ANNUAL  ALL       00000005
  552928.74000 4168030.85000       0.00013     8.77   125.64
0.00  ANNUAL  ALL       00000005
** CONCUNIT ug/m^3
** DEPUNIT g/m^2
```

Operational Risk Calcs

		3rd trimester	0<2	2<9	2<16	16<30	16-70	Total
Receptor Type	School							
AERMOD CONCENTRATION (ug/m^3)	0.00013							
Dose		2.14E-08	1.07E-07	5.70E-08	4.63E-08	2.14E-08		
Risk		0.00	1.13E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.1E-07
Risk per million		0.00	0.113	0.00	0.00	0.00	0.00	0.11
Chronic HI		-	-	-	-	-	-	0.000026
PM2.5		-	-	-	-	-	-	0.00013

DPM HRA Factors and values - Construction

Dose fa

$$Dose\text{-}air = C_{air} \times (BR/BW) \times A \times EF \times 10^{-6}$$

		3rd trimester	0<2	2<9	9<16	16<30	16-70	source
Dose factors for calcs --->	School	1.64E-04	8.22E-04	4.38E-04	3.56E-04	1.64E-04	1.58E-04	*dose factors for lookup in risk calcs*
Daily Breath Rate (L/kg-day)	School	240	1200	640	520	240	230	SJVAPCD for 3rd tri; 95th percentile for all
A		1	1	1	1	1	1	OEHHA 2015, page 5-24
EF, Exposure frequency (unitless), days/365 days	School	0.68	0.68	0.68	0.68	0.68	0.68	OEHHA 2015, page 5-24, 5 days/week, 11.5 hours/day (Daycare)
Conversion Factor		1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	(mg/ug + m3/L)

Risk Fac

$$RISK_{inh\text{-}res} = DOSE_{air} \times CPF \times ASF \times ED/AT \times FAH$$

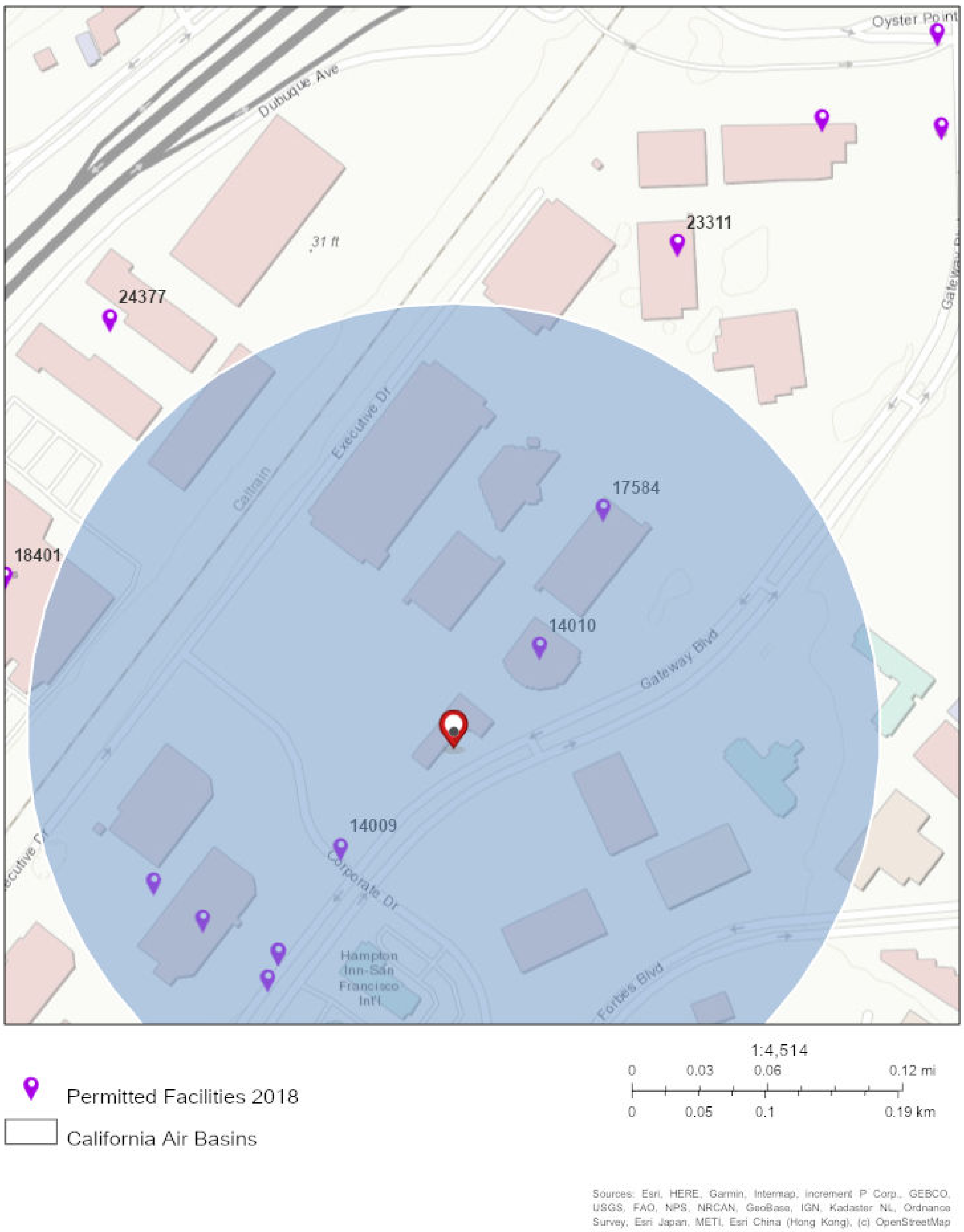
Risk factors for calcs --->	School	0.00E+00	1.06E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*risk factors for lookup in risk calcs*
CPF, DPM ([mg/kg-day]$^{-1}$)		1.1	1.1	1.1	1.1	1.1	1.1	OEHHA 2015, Table 7.1
Average Age Sensitivity Factor		10	10	3	3	1	1	OEHHA 2015, Table 8.3
AT, Average Time (years)		70	70	70	70	70	70	Averaging time for lifetime cancer risk
FAH		1.00	1.00	1.00	1.00	1.00	1.00	OEHHA 2015, Table 8.4: Use FAH = 1 if a school is within the 1×10-6 (or greater) cancer risk isopleth
ED, Exposure Duration (years)	School		2.00			0	0	OEHHA 2015, Table 6.3
Adjustment Factor		3.36	3.36	3.36	3.36	3.36	3.36	
Chronic Inhalation Reference Exposure Level, respiratory, DPM		5						

Stationary Source Risk & Hazards Screening Report

Area of Interest (AOI) Information

Area : 3,134,508.61 ft²

Jul 24 2020 14:42:19 Pacific Daylight Time



Summary

Name	Count	Area(ft²)	Length(ft)
Permitted Facilities 2018	8	N/A	N/A

Permitted Facilities 2018

#	FACID	Name	Address	City	St
1	14009	Boston Properties	651 Gateway Boulevard	South San Francisco	CA
2	14010	Boston Properties	601 Gateway Boulevard	South San Francisco	CA
3	15916	Boston Properties	611 Gateway Boulevard	South San Francisco	CA
4	16024	Genentech, Inc	611 Gateway Boulevard	South San Francisco	CA
5	17584	Alexandria Real Estate Equities Inc	681 GATEWAY BLVD	S SAN FRAN	CA
6	17649	Alexandria Real Estate Equities, Inc	Gateway Boulevard	South San Francisco	CA
7	19179	MacroGenics West,Inc	One Corporate Drive	South San Francisco	CA
8	20236	Biotech Gateway - HCP c/o CBRE	2 Corporate Drive	South San Francisco	CA

#	Zip	County	Cancer	Hazard	PM_25	Type	Count
1	94080	San Mateo	20.250	0.030	0.330	Contact BAAQMD	1
2	94080	San Mateo	0.780	0.000	0.000	Generators	1
3	94080	San Mateo	1.770	0.000	0.000	Contact BAAQMD	1
4	94080	San Mateo	2.730	0.010	0.000	Generators	1
5	94080	San Mateo	2.380	0.000	0.000	Generators	1
6	94080	San Mateo	9.310	0.010	0.010	Generators	1
7	94080	San Mateo	39.610	0.020	0.050	Generators	1
8	94080	San Mateo	1.660	0.000	0.000	Generators	1

Note: The estimated risk and hazard impacts from these sources would be expected to be substantially lower when site specific Health Risk Screening Assessments are conducted.

The screening level map is not recommended for evaluating sensitive land uses such as schools, senior centers, day cares, and health facilities.

Gasoline Dispensing Facility (GDF) Distance Multiplier Tool: This distance multiplier tool refines the screening values for cancer risk and chronic hazard index found in the District's Stationary Source Screening Analysis Tool for GDF's, to represent adjusted risk and hazard impacts that can be expected with farther distances from the source of emissions.

Gas Station

Distance (meters)	Distance (feet)	Distance adjustment multiplier	Enter Risk or Hazard	Adjusted Risk or Hazard
0	0.0	1.000		0.0000
5	16.4	1.000		0.0000
10	32.8	1.000		0.0000
15	49.2	1.000		0.0000
20	65.6	1.000		0.0000
25	82.0	0.728		0.0000
30	98.4	0.559		0.0000
35	114.8	0.445		0.0000
40	131.2	0.365		0.0000
45	147.6	0.305		0.0000
50	164.0	0.260		0.0000
55	180.4	0.225		0.0000
60	196.9	0.197		0.0000
65	213.3	0.174		0.0000
70	229.7	0.155		0.0000
75	246.1	0.139		0.0000
80	262.5	0.126		0.0000
85	278.9	0.114		0.0000
90	295.3	0.104		0.0000
95	311.7	0.096		0.0000
100	328.1	0.088		0.0000
105	344.5	0.082		0.0000
110	360.9	0.076		0.0000
115	377.3	0.071		0.0000
120	393.7	0.066		0.0000
125	410.1	0.062		0.0000
130	426.5	0.058		0.0000
135	442.9	0.055		0.0000
140	459.3	0.052		0.0000
145	475.7	0.049		0.0000
150	492.1	0.046		0.0000
155	508.5	0.044		0.0000
160	524.9	0.042		0.0000
165	541.3	0.040		0.0000
170	557.7	0.038		0.0000
175	574.1	0.036		0.0000
180	590.6	0.034		0.0000
185	607.0	0.033		0.0000
190	623.4	0.031		0.0000
195	639.8	0.030		0.0000
200	656.2	0.029		0.0000
205	672.6	0.028		0.0000
210	689.0	0.027		0.0000
215	705.4	0.026		0.0000
220	721.8	0.025		0.0000
225	738.2	0.024		0.0000
230	754.6	0.023		0.0000
235	771.0	0.022		0.0000
240	787.4	0.022		0.0000
245	803.8	0.021		0.0000
250	820.2	0.020		0.0000
255	836.6	0.020		0.0000
260	853.0	0.019		0.0000
265	869.4	0.018		0.0000
270	885.8	0.018		0.0000
275	902.2	0.017		0.0000
280	918.6	0.017		0.0000
285	935.0	0.016		0.0000
290	951.4	0.016		0.0000
295	967.8	0.015		0.0000
300	984.3	0.015		0.0000

Diesel Internal Combustion (IC) Engine Distance Multiplier Tool: This distance multiplier tool refines the screening values for cancer risk and $PM_{2.5}$ concentrations found in the District's Stationary Source Screening Analysis Tool for permitted facilities which contain only diesel IC engines, to represent adjusted risk and hazard impacts that can be expected with farther distances from the source of emissions.

Diesel Backup Generator

Distance (meters)	Distance (feet)	Distance adjustment multiplier	Enter Risk or Hazard	Adjusted Risk or Hazard	Enter PM2.5 Concentration	Adjusted PM2.5 Concentration
0	0.0	1.000		0		0
5	16.4	1.000		0		0
10	32.8	1.000		0		0
15	49.2	1.000		0		0
20	65.6	1.000		0		0
25	82.0	0.85		0		0
30	98.4	0.73		0		0
35	114.8	0.64		0		0
40	131.2	0.58		0		0
50	164.0	0.5		0		0
60	196.9	0.41	0.78	0.3198	0	0
70	229.7	0.31		0		0
80	262.5	0.28		0		0
90	295.3	0.25		0		0
100	328.1	0.22		0		0
110	360.9	0.18		0		0
120	393.7	0.16		0		0
130	426.5	0.15		0		0
140	459.3	0.14		0		0
150	492.1	0.12		0		0
160	524.9	0.1	27.13	2.713	0.33	0.033
180	590.6	0.09		0		0
200	656.2	0.08	10.97	0.8776	0.01	0.0008
220	721.8	0.07	39.61	2.7727	0.05	0.0035
240	787.4	0.06		0		0
260	853.0	0.05		0		0
280	918.6	0.04		0		0

Generic Distance Multiplier Tool: This distance multiplier tool refines the screening values to represent adjusted risk and hazard impacts that can be expected with farther distances from the source of emissions.

Generic Case

Distance (meters)	Distance (feet)	Multiplier
0	0.0	1.000
5	16.4	1.000
10	32.8	0.883
15	49.2	0.855
20	65.6	0.827
25	82.0	0.801
30	98.4	0.775
35	114.8	0.750
40	131.2	0.726
45	147.6	0.702
50	164.0	0.679
55	180.4	0.658
60	196.9	0.636
65	213.3	0.616
70	229.7	0.596
75	246.1	0.577
80	262.5	0.558
85	278.9	0.540
90	295.3	0.523
95	311.7	0.506
100	328.1	0.489
105	344.5	0.474
110	360.9	0.458
115	377.3	0.444
120	393.7	0.429
125	410.1	0.415
130	426.5	0.402
135	442.9	0.389
140	459.3	0.376
145	475.7	0.364
150	492.1	0.353
155	508.5	0.341
160	524.9	0.330
165	541.3	0.319
170	557.7	0.309
175	574.1	0.299
180	590.6	0.290
185	607.0	0.280
190	623.4	0.271
195	639.8	0.262
200	656.2	0.254
205	672.6	0.246
210	689.0	0.238
215	705.4	0.230
220	721.8	0.223
225	738.2	0.216
230	754.6	0.209
235	771.0	0.202
240	787.4	0.195
245	803.8	0.189
250	820.2	0.183
255	836.6	0.177
260	853.0	0.171
265	869.4	0.166
270	885.8	0.160
275	902.2	0.155
280	918.6	0.150
285	935.0	0.145
290	951.4	0.141
295	967.8	0.136
300	984.3	0.132

Appendix C
Assembly Bill 52 Consultation Materials

751 Gateway Project - Assembly Bill 52 Consultation Log

Date	To/From ICF	Lead Agency Contact	Contact	Address	Phone #	Email	Organization Affiliation	Tribal Affiliation	Type	Subject
1/15/2020	from the City of South San Francisco California	Adena Friedman, Senior Planner	Irenne Zweirlein, Chairperson	789 Canada Road Woodside, CA 94062	650.851.7489 (c) 650.332.1526 (o)	amahmustsuntribal@gmail.com	Amah Mutsun Tribal Band of Mission San Juan Bautista	Costanoan	Letter	a letter requesting information regarding the project
1/15/2020	from the City of South San Francisco California	Adena Friedman, Senior Planner	Ann Marie Sayers, Chairperson	PO Box 28 Hollister, CA 95024	831.637.4238	ams@indiancanyon.org	Indian Canyon Mutsun Band of Coastanoan	Costanoan	Letter	a letter requesting information regarding the project
1/15/2020	from the City of South San Francisco California	Adena Friedman, Senior Planner	Rosemary Cambra, Chairperson	P.O. Box 360791, Milpitas, CA 95036	NA		Muwekma Ohlone Indian Tribe of the SF Bay Area	Costanoan	Letter	a letter requesting information regarding the project
1/15/2020	from the City of South San Francisco California	Adena Friedman, Senior Planner	Andrew Galvan	PO Box 3152 Fremont, CA 94539	510.882.0527	chochenyo@aol.com	The Ohlone Indian Tribe	Bay Miwok Ohlone Patwin Plains Miwok	Letter	a letter requesting information regarding the project
1/15/2020	from the City of South San Francisco California	Adena Friedman, Senior Planner	Tony Cerda, Chairperson	244 E 1st Street Pomona, CA 91766			Rumsen Carmel Tribe	Costanoan	Letter	a letter requesting information regarding the project

CITY COUNCIL 2020

RICHARD GARBARINO, MAYOR
MARK ADDIEGO, VICE MAYOR
KARYL MATSUMOTO, COUNCILMEMBER
MARK NAGALES, COUNCILMEMBER
BUENAFLOR NICOLAS, COUNCILMEMBER

MIKE FUTRELL, CITY MANAGER

DEPARTMENT OF ECONOMIC
AND COMMUNITY DEVELOPMENT
(650) 829-6620
FAX (650) 829-6657
E-MAIL WEB-ECD@SSF.NET

January 15, 2020

Amah Mutsun Tribal Band of Mission San Juan Bautista
Irenne Zwierlein, Chairperson
789 Canada Road
Woodside, CA 94062

RE: Tribal Cultural Resources under the California Environmental Quality Act, Assembly Bill 52 Formal Notification of Project Consideration and Notification of Consultation Opportunity, pursuant to Public Resources Code §21080.3.1

Dear Ms. Zwierlein:

The City of South San Francisco (City) has received a complete project application for the 751 Gateway Boulevard Project (project) and has begun environmental analysis of the project. While no notice has been formally requested under Public Resources Code (PRC) §21080.1(d), this letter has been sent upon the recommendation of the Native American Heritage Commission to tribes that are culturally and traditionally affiliated with the area.

Below and on the subsequent pages, please find a description of the project, a map showing the project site, and the name of our project point of contact, pursuant to PRC § 21080.3.1 (d).

Project Description

The 7.4-acre project site (Assessor's Parcel Numbers 015-024-290 and 015-024-360) consists of a 6-story, approximately 176,000-square foot office building at 701 Gateway Boulevard and a surface parking lot containing approximately 564 parking spaces. The project site is located in the Gateway Campus and is bounded by a commercial and office building (901 Gateway Boulevard) and a surface parking lot to the north, Gateway Boulevard to the east, a surface parking lot to the south, and commercial and office buildings to the west in the City of South San Francisco, California. The proposed project would be constructed on the site of an existing surface parking lot. The proposed project would construct a new 148-foot-tall, 7-story building with approximately 208,800 square feet of lab and office uses on the existing surface parking lot. The existing office building at 701 Gateway Boulevard would be retained. The proposed project would also include surface parking lots with a total of 418 parking spaces (including 46 parking spaces in a lot north of the proposed building) that would be used by other buildings within the Gateway Campus. The

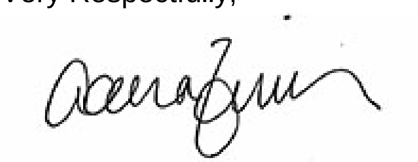
project would require grading or disturbing an area of approximately 149,000 square feet during construction and 1,850 cubic yards of soil would be excavated. The project would require a maximum depth of excavation reaching approximately 9 feet below ground surface. Figure 1, a map of the project location, is included with this letter.

The City would like to provide you with an opportunity to communicate concerns you might have regarding places within the project area that may be important to your community. The City requests your participation in the identification and protection of cultural resources, sacred lands or other heritage sites within the above described project area with the understanding that you or other members of the community might possess specialized knowledge of the area.

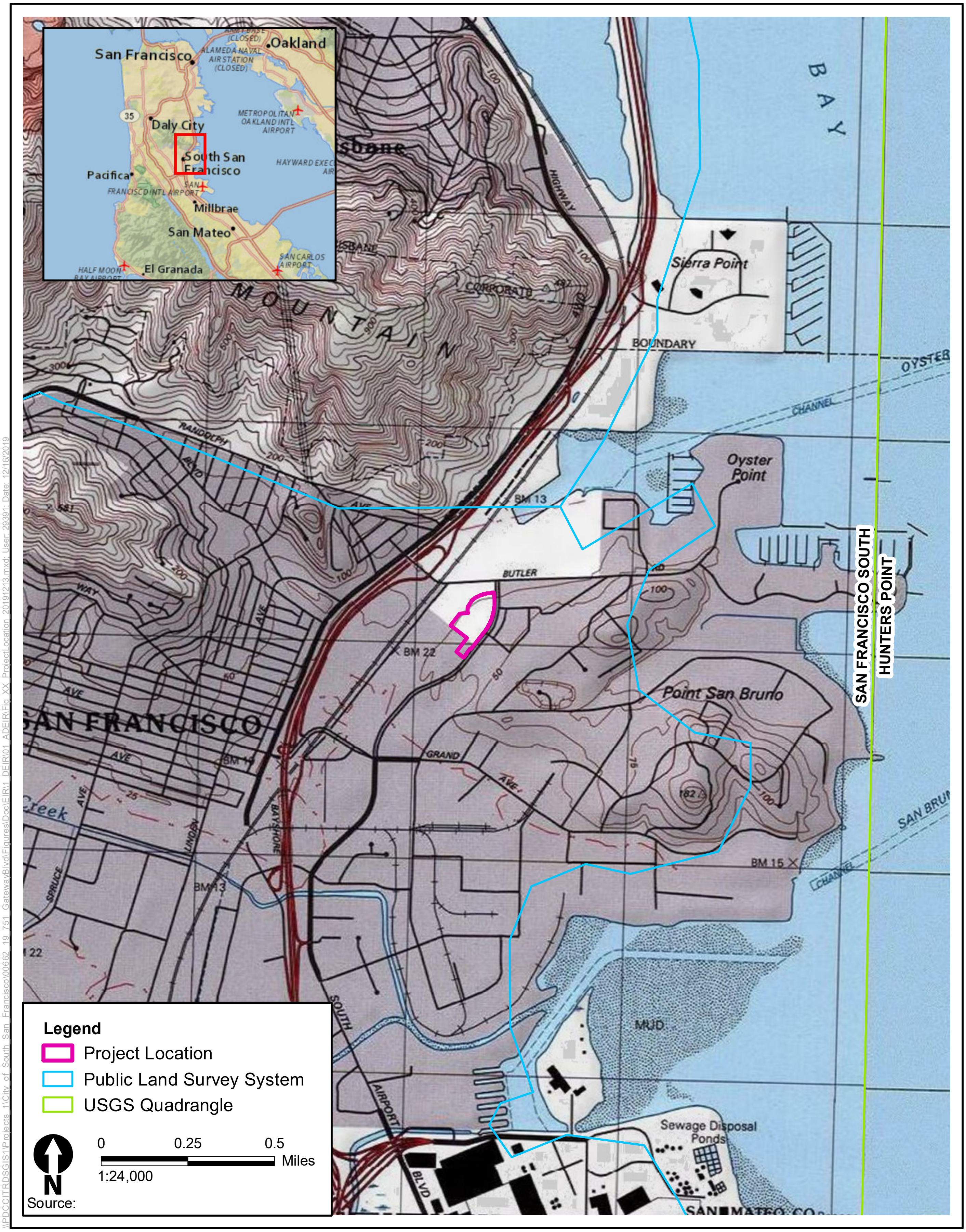
Lead Agency Point of Contact
Attn: Adena Friedman, Senior Planner
City of South San Francisco
Department of Economic and Community Development
315 Maple Street
South San Francisco, CA 94080
Email: adena.friedman@ssf.net
Phone: 650-877-8535

Pursuant to PRC §21080.3.1 (b), you have 30 days from the receipt of this letter to request consultation, in writing, with the City of South San Francisco.

Very Respectfully,



Adena Friedman, Senior Planner
City of South San Francisco



751 Gateway Boulevard Project

Fig 1. Project Location
Buri Buri Land Grant

DEPARTMENT OF ECONOMIC
AND COMMUNITY DEVELOPMENT
(650) 829-6620
FAX (650) 829-6657
E-MAIL WEB-ECD@SSF.NET

January 15, 2020

Indian Canyon Mutsun Band of Costanoan
Ann Marie Savers, Chairperson
P.O. Box 28
Hollister, CA 95024

RE: Tribal Cultural Resources under the California Environmental Quality Act, Assembly Bill 52 Formal Notification of Project Consideration and Notification of Consultation Opportunity, pursuant to Public Resources Code §21080.3.1

Dear Ms. Savers:

The City of South San Francisco (City) has received a complete project application for the 751 Gateway Boulevard Project (project) and has begun environmental analysis of the project. While no notice has been formally requested under Public Resources Code (PRC) §21080.1(d), this letter has been sent upon the recommendation of the Native American Heritage Commission to tribes that are culturally and traditionally affiliated with the area.

Below and on the subsequent pages, please find a description of the project, a map showing the project site, and the name of our project point of contact, pursuant to PRC § 21080.3.1 (d).

Project Description

The 7.4-acre project site (Assessor's Parcel Numbers 015-024-290 and 015-024-360) consists of a 6-story, approximately 176,000-square foot office building at 701 Gateway Boulevard and a surface parking lot containing approximately 564 parking spaces. The project site is located in the Gateway Campus and is bounded by a commercial and office building (901 Gateway Boulevard) and a surface parking lot to the north, Gateway Boulevard to the east, a surface parking lot to the south, and commercial and office buildings to the west in the City of South San Francisco, California. The proposed project would be constructed on the site of an existing surface parking lot. The proposed project would construct a new 148-foot-tall, 7-story building with approximately 208,800 square feet of lab and office uses on the existing surface parking lot. The existing office building at 701 Gateway Boulevard would be retained. The proposed project would also include surface parking lots with a total of 418 parking spaces (including 46 parking spaces in a lot north of the proposed building) that would be used by other buildings within the Gateway Campus. The

project would require grading or disturbing an area of approximately 149,000 square feet during construction and 1,850 cubic yards of soil would be excavated. The project would require a maximum depth of excavation reaching approximately 9 feet below ground surface. Figure 1, a map of the project location, is included with this letter.

The City would like to provide you with an opportunity to communicate concerns you might have regarding places within the project area that may be important to your community. The City requests your participation in the identification and protection of cultural resources, sacred lands or other heritage sites within the above described project area with the understanding that you or other members of the community might possess specialized knowledge of the area.

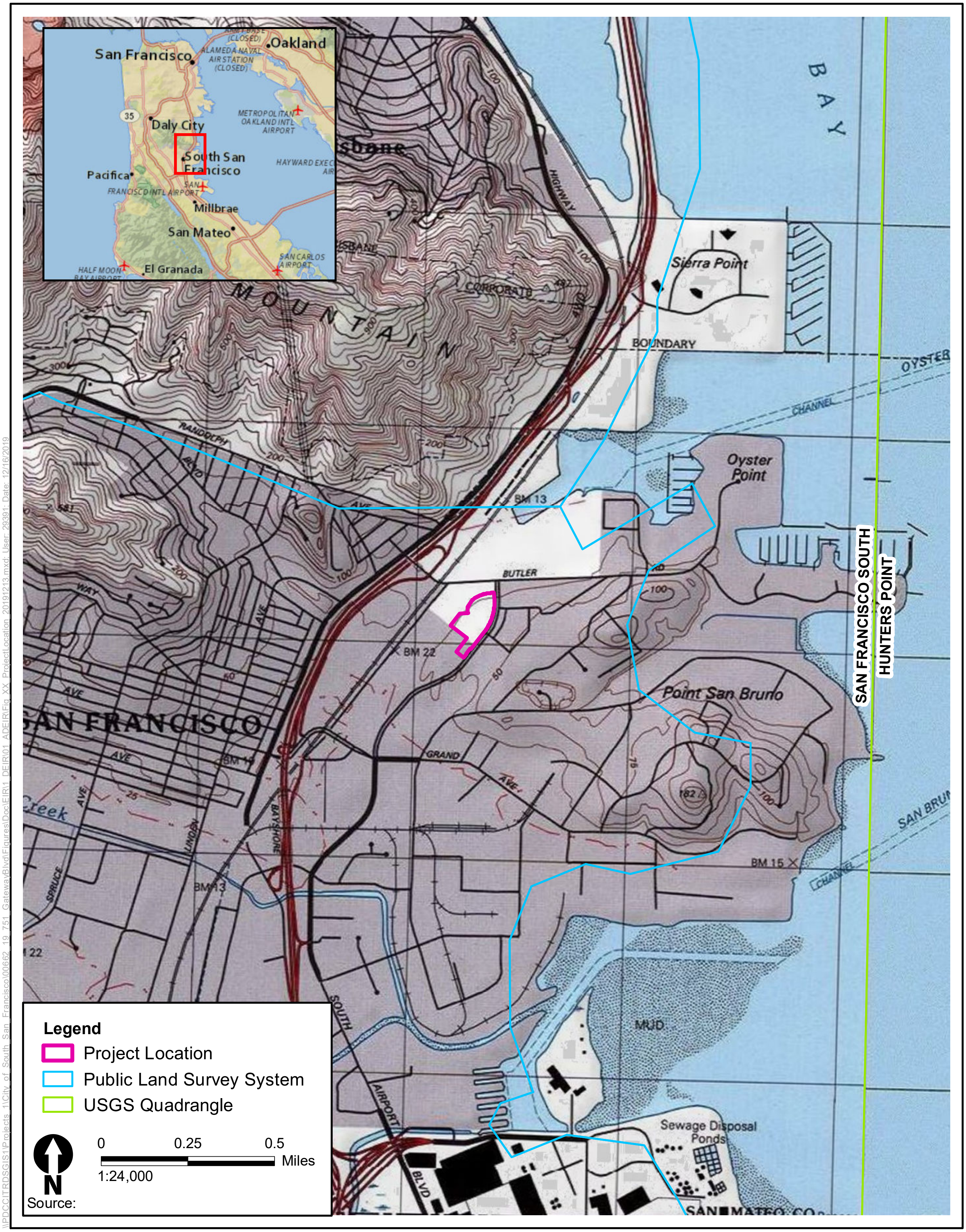
Lead Agency Point of Contact

Attn: Adena Friedman, Senior Planner
City of South San Francisco
Department of Economic and Community Development
315 Maple Street
South San Francisco, CA 94080
Email: adena.friedman@ssf.net
Phone: 650-877-8535

Pursuant to PRC §21080.3.1 (b), you have 30 days from the receipt of this letter to request consultation, in writing, with the City of South San Francisco.

Very Respectfully,

Adena Friedman, Senior Planner
City of South San Francisco



751 Gateway Boulevard Project

Fig 1. Project Location
Buri Buri Land Grant

DEPARTMENT OF ECONOMIC
AND COMMUNITY DEVELOPMENT
(650) 829-6620
FAX (650) 829-6657
E-MAIL WEB-ECD@SSF.NET

January 15, 2020

Muwekma Ohlone Indian Tribe of the SF Bay Area
Rosemary Cambra, Chairperson
P.O. Box 360791
Milpitas, CA 95036

RE: Tribal Cultural Resources under the California Environmental Quality Act, Assembly Bill 52 Formal Notification of Project Consideration and Notification of Consultation Opportunity, pursuant to Public Resources Code §21080.3.1

Dear Ms. Cambra:

The City of South San Francisco (City) has received a complete project application for the 751 Gateway Boulevard Project (project) and has begun environmental analysis of the project. While no notice has been formally requested under Public Resources Code (PRC) §21080.1(d), this letter has been sent upon the recommendation of the Native American Heritage Commission to tribes that are culturally and traditionally affiliated with the area.

Below and on the subsequent pages, please find a description of the project, a map showing the project site, and the name of our project point of contact, pursuant to PRC § 21080.3.1 (d).

Project Description

The 7.4-acre project site (Assessor's Parcel Numbers 015-024-290 and 015-024-360) consists of a 6-story, approximately 176,000-square foot office building at 701 Gateway Boulevard and a surface parking lot containing approximately 564 parking spaces. The project site is located in the Gateway Campus and is bounded by a commercial and office building (901 Gateway Boulevard) and a surface parking lot to the north, Gateway Boulevard to the east, a surface parking lot to the south, and commercial and office buildings to the west in the City of South San Francisco, California. The proposed project would be constructed on the site of an existing surface parking lot. The proposed project would construct a new 148-foot-tall, 7-story building with approximately 208,800 square feet of lab and office uses on the existing surface parking lot. The existing office building at 701 Gateway Boulevard would be retained. The proposed project would also include surface parking lots with a total of 418 parking spaces (including 46 parking spaces in a lot north of the proposed building) that would be used by other buildings within the Gateway Campus. The

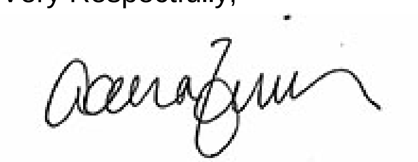
project would require grading or disturbing an area of approximately 149,000 square feet during construction and 1,850 cubic yards of soil would be excavated. The project would require a maximum depth of excavation reaching approximately 9 feet below ground surface. Figure 1, a map of the project location, is included with this letter.

The City would like to provide you with an opportunity to communicate concerns you might have regarding places within the project area that may be important to your community. The City requests your participation in the identification and protection of cultural resources, sacred lands or other heritage sites within the above described project area with the understanding that you or other members of the community might possess specialized knowledge of the area.

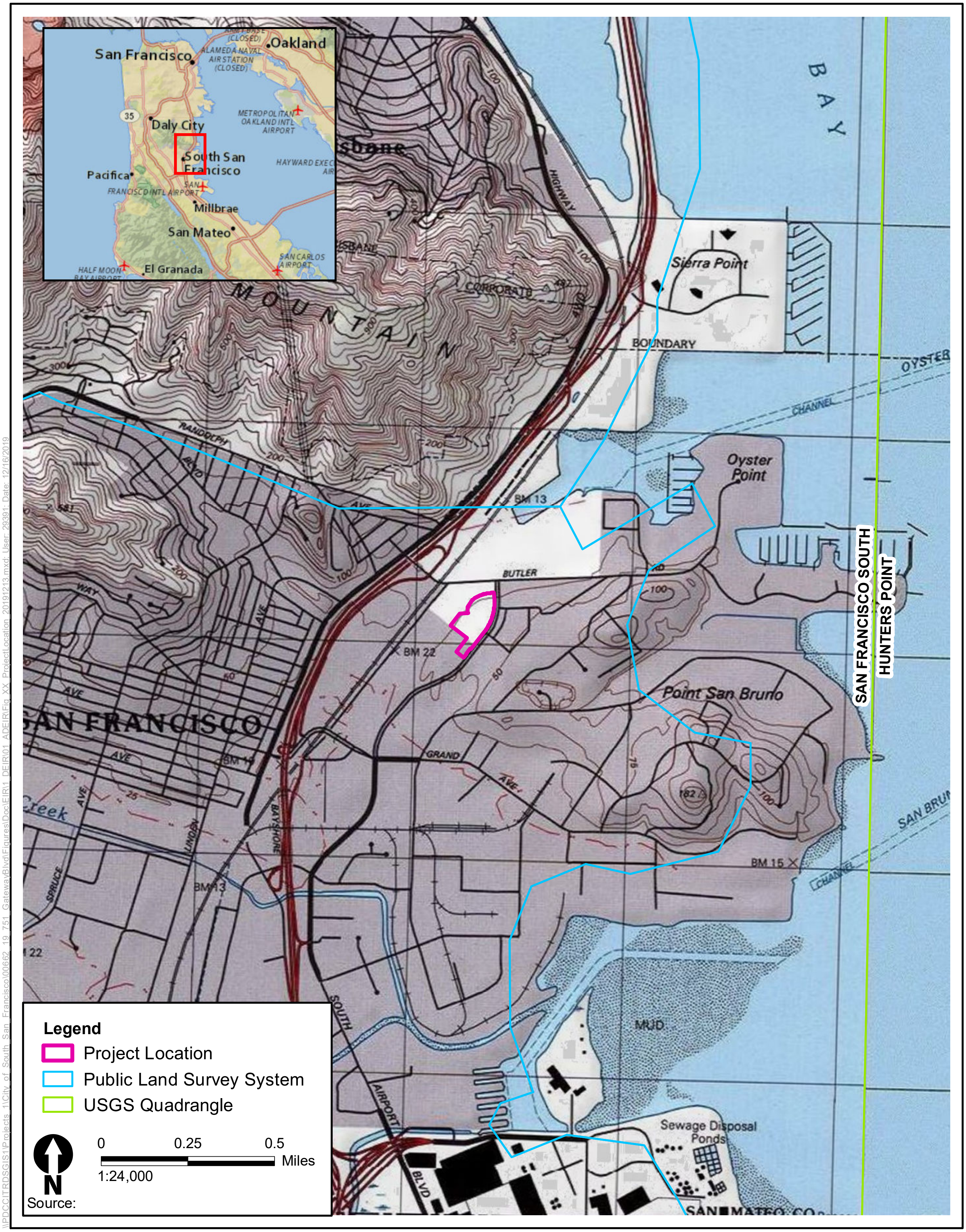
Lead Agency Point of Contact
Attn: Adena Friedman, Senior Planner
City of South San Francisco
Department of Economic and Community Development
315 Maple Street
South San Francisco, CA 94080
Email: adena.friedman@ssf.net
Phone: 650-877-8535

Pursuant to PRC §21080.3.1 (b), you have 30 days from the receipt of this letter to request consultation, in writing, with the City of South San Francisco.

Very Respectfully,



Adena Friedman, Senior Planner
City of South San Francisco



751 Gateway Boulevard Project

Fig 1. Project Location
Buri Buri Land Grant

DEPARTMENT OF ECONOMIC
AND COMMUNITY DEVELOPMENT
(650) 829-6620
FAX (650) 829-6657
E-MAIL WEB-ECD@SSF.NET

January 15, 2020

The Ohlone Indian Tribe
Andrew Galvan
P.O. Box 3152
Fremont, CA 94539

RE: Tribal Cultural Resources under the California Environmental Quality Act, Assembly Bill 52 Formal Notification of Project Consideration and Notification of Consultation Opportunity, pursuant to Public Resources Code §21080.3.1

Dear Mr. Galvan:

The City of South San Francisco (City) has received a complete project application for the 751 Gateway Boulevard Project (project) and has begun environmental analysis of the project. While no notice has been formally requested under Public Resources Code (PRC) §21080.1(d), this letter has been sent upon the recommendation of the Native American Heritage Commission to tribes that are culturally and traditionally affiliated with the area.

Below and on the subsequent pages, please find a description of the project, a map showing the project site, and the name of our project point of contact, pursuant to PRC § 21080.3.1 (d).

Project Description
The 7.4-acre project site (Assessor's Parcel Numbers 015-024-290 and 015-024-360) consists of a 6-story, approximately 176,000-square foot office building at 701 Gateway Boulevard and a surface parking lot containing approximately 564 parking spaces. The project site is located in the Gateway Campus and is bounded by a commercial and office building (901 Gateway Boulevard) and a surface parking lot to the north, Gateway Boulevard to the east, a surface parking lot to the south, and commercial and office buildings to the west in the City of South San Francisco, California. The proposed project would be constructed on the site of an existing surface parking lot. The proposed project would construct a new 148-foot-tall, 7-story building with approximately 208,800 square feet of lab and office uses on the existing surface parking lot. The existing office building at 701 Gateway Boulevard would be retained. The proposed project would also include surface parking lots with a total of 418 parking spaces (including 46 parking spaces in a lot north of the proposed building) that would be used by other buildings within the Gateway Campus. The

project would require grading or disturbing an area of approximately 149,000 square feet during construction and 1,850 cubic yards of soil would be excavated. The project would require a maximum depth of excavation reaching approximately 9 feet below ground surface. Figure 1, a map of the project location, is included with this letter.

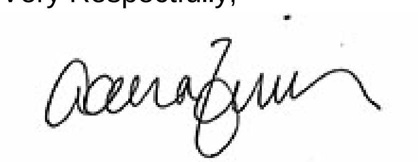
The City would like to provide you with an opportunity to communicate concerns you might have regarding places within the project area that may be important to your community. The City requests your participation in the identification and protection of cultural resources, sacred lands or other heritage sites within the above described project area with the understanding that you or other members of the community might possess specialized knowledge of the area.

Lead Agency Point of Contact

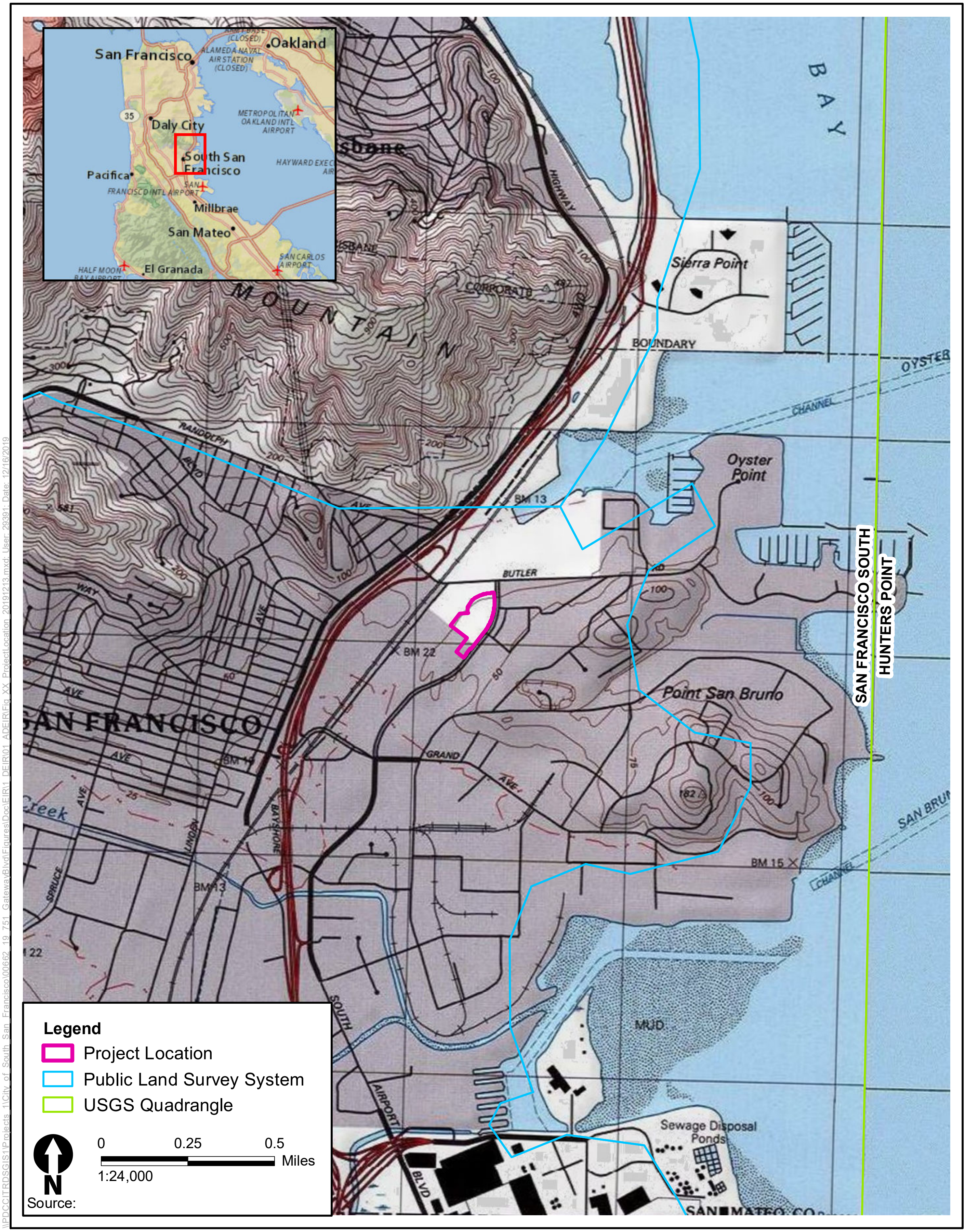
Attn: Adena Friedman, Senior Planner
City of South San Francisco
Department of Economic and Community Development
315 Maple Street
South San Francisco, CA 94080
Email: adena.friedman@ssf.net
Phone: 650-877-8535

Pursuant to PRC §21080.3.1 (b), you have 30 days from the receipt of this letter to request consultation, in writing, with the City of South San Francisco.

Very Respectfully,



Adena Friedman, Senior Planner
City of South San Francisco



751 Gateway Boulevard Project

Fig 1. Project Location
Buri Buri Land Grant

DEPARTMENT OF ECONOMIC
AND COMMUNITY DEVELOPMENT
(650) 829-6620
FAX (650) 829-6657
E-MAIL WEB-ECD@SSF.NET

January 15, 2020

Coastanoan Rumsen Carmel Tribe
Tony Cerda, Chairperson
244 E 1st Street,
Pomona, CA 91766

RE: Tribal Cultural Resources under the California Environmental Quality Act, Assembly Bill 52 Formal Notification of Project Consideration and Notification of Consultation Opportunity, pursuant to Public Resources Code §21080.3.1

Dear Mr. Cerda:

The City of South San Francisco (City) has received a complete project application for the 751 Gateway Boulevard Project (project) and has begun environmental analysis of the project. While no notice has been formally requested under Public Resources Code (PRC) §21080.1(d), this letter has been sent upon the recommendation of the Native American Heritage Commission to tribes that are culturally and traditionally affiliated with the area.

Below and on the subsequent pages, please find a description of the project, a map showing the project site, and the name of our project point of contact, pursuant to PRC § 21080.3.1 (d).

Project Description

The 7.4-acre project site (Assessor's Parcel Numbers 015-024-290 and 015-024-360) consists of a 6-story, approximately 176,000-square foot office building at 701 Gateway Boulevard and a surface parking lot containing approximately 564 parking spaces. The project site is located in the Gateway Campus and is bounded by a commercial and office building (901 Gateway Boulevard) and a surface parking lot to the north, Gateway Boulevard to the east, a surface parking lot to the south, and commercial and office buildings to the west in the City of South San Francisco, California. The proposed project would be constructed on the site of an existing surface parking lot. The proposed project would construct a new 148-foot-tall, 7-story building with approximately 208,800 square feet of lab and office uses on the existing surface parking lot. The existing office building at 701 Gateway Boulevard would be retained. The proposed project would also include surface parking lots with a total of 418 parking spaces (including 46 parking spaces in a lot north of the proposed building) that would be used by other buildings within the Gateway Campus. The

project would require grading or disturbing an area of approximately 149,000 square feet during construction and 1,850 cubic yards of soil would be excavated. The project would require a maximum depth of excavation reaching approximately 9 feet below ground surface. Figure 1, a map of the project location, is included with this letter.

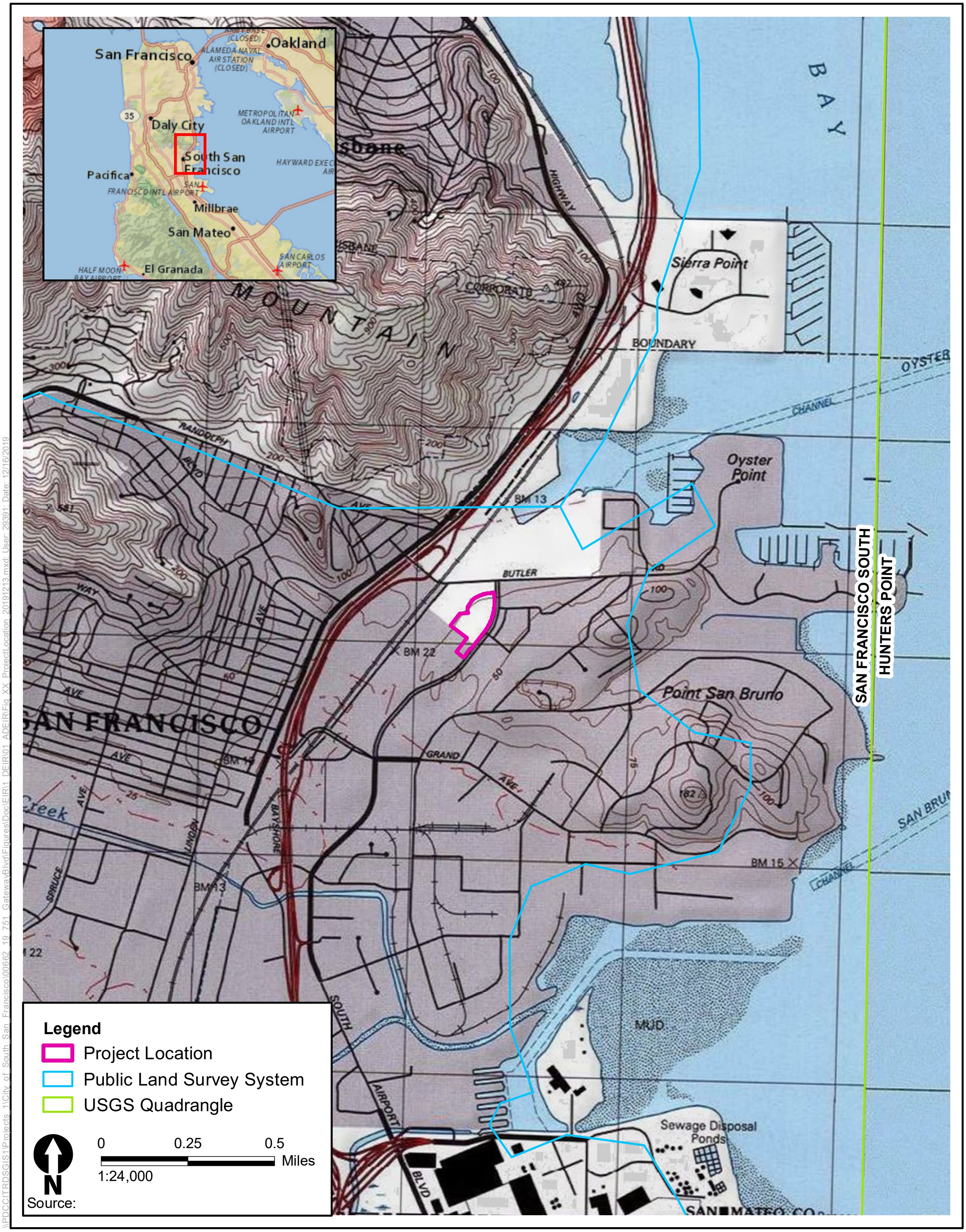
The City would like to provide you with an opportunity to communicate concerns you might have regarding places within the project area that may be important to your community. The City requests your participation in the identification and protection of cultural resources, sacred lands or other heritage sites within the above described project area with the understanding that you or other members of the community might possess specialized knowledge of the area.

Lead Agency Point of Contact
Attn: Adena Friedman, Senior Planner
City of South San Francisco
Department of Economic and Community Development
315 Maple Street
South San Francisco, CA 94080
Email: adena.friedman@ssf.net
Phone: 650-877-8535

Pursuant to PRC §21080.3.1 (b), you have 30 days from the receipt of this letter to request consultation, in writing, with the City of South San Francisco.

Very Respectfully,

Adena Friedman, Senior Planner
City of South San Francisco



751 Gateway Boulevard Project

Fig 1. Project Location
Buri Buri Land Grant

Appendix D
Transportation Impact Analysis

751 Gateway Boulevard

Final Transportation Impact Analysis

Prepared for:
ICF

September 18, 2020

SF19-1078

FEHR PEERS

Table of Contents

List of Figures

List of Tables

1. Project Description

The transportation impact analysis (TIA) evaluates potential transportation impacts associated with the 751 Gateway Boulevard development project ("Project"). The Project involves construction of a 148-foot-tall, seven-story building with approximately 208,800 square feet of space (60 percent research and development [R&D] uses and 40 percent office uses) on the site of an existing northern surface parking lot on a 7.4-acre site in the City of South San Francisco's East of 101 employment area. The project site includes an existing 170,235 square foot office building at 701 Gateway Boulevard, which would remain under the Project.

The Project would also include a master parking plan for the portion of the Gateway Campus[1] consisting of 601 Gateway Boulevard, 611 Gateway Boulevard, 651 Gateway Boulevard, 681 – 685 Gateway Boulevard, 701 Gateway Boulevard, and 751 Gateway Boulevard. The master parking plan would provide 3,099 parking spaces, which would provide a ratio of 2.4 spaces/1,000 gross square feet (gsf) for this portion of the Gateway Campus. Of these spaces, 1,916 would serve 601, 611, and 651 Gateway Boulevard (office) in a shared parking arrangement (2.5 spaces/1,000 gsf), 289 would serve 681-685 Gateway Boulevard (lab) (2 spaces/1,000 gsf), 434 would serve 701 Gateway Boulevard (office)(2.5 spaces/1,000 gsf spaces/1000 gsf), and 418 would serve 751 Gateway Boulevard (lab) (2.00 spaces/1,000 gsf).

Primary bicycle, pedestrian, and motor vehicle site access is provided via the Gateway Boulevard frontage. Additional access is provided by an unnamed street that connects to Poletti Way. The project site design includes pedestrian connections between the neighboring Gateway Campus while maintaining the existing access drive that would curve around the proposed building.

1.1 Alternative Mode Share Target

The proposed project would maintain the existing zoning designation of Zone IV under the Gateway Specific Plan District (GSPD). The existing zoning allows for development at a floor area ratio (FAR) of 1.25, or a maximum of 402,930 square feet, within the project site. The building at 701 Gateway Boulevard is approximately 170,235 square feet. Based on the zoning, 232,695 square feet of unrealized FAR is associated with the project site. The proposed project would use a portion of the unrealized FAR associated with the project site. The total proposed FAR for the site, including both the existing building at 701 Gateway Boulevard and the proposed building at 751 Gateway Boulevard, would be 1.18.

The proposed project would require submittal of a TDM plan to the Planning Division for review and approval as part of the entitlement process, per the requirements of the South San Francisco Municipal Code (SSFMC) and the General Plan. The City's TDM program is intended to reduce the amount of traffic generated by new development, reduce the share of drive-alone traffic during peak periods, and incentivize

[1] The project site is in an area referred to as the Gateway Campus (consisting of nine buildings at 601, 611, and 651 Gateway Boulevard; 681 to 685 Gateway Boulevard; 701 Gateway Boulevard; 801 Gateway Boulevard; and 901 to 951 Gateway Boulevard).

the use of alternative modes of transportation. While SSFMC Section 20.400 does not call out a specific alternate mode-share (AMS) requirement for the Gateway Specific Plan District, similar zoning districts, and General Plan requirements in the East of 101 area require an AMS of 35 – 40% for development of a Floor Area Ratio of 1.0 – 1.25, and this standard would be applied to the 751 Gateway project, consistent with the City's requirements, and policies to increase AMS and decrease single occupancy vehicle traffic. While the City interprets the regulatory TDM requirements to require the project to achieve an AMS of 35 to 40 percent, this CEQA analysis assumes a higher drive-alone share and more conservative AMS of 26 percent consistent with the City/County Association of Governments of San Mateo County (C/CAG) travel demand model and analysis for other similar projects within the City and the region.. The City's TDM ordinance identifies several required and optional trip reduction measures for inclusion in a TDM Plan. The ordinance requires an annual employee mode share survey of the project site to ensure that desired transportation mode shares are achieved. Where the mode share target is not achieved, City officials may require program modifications intended to increase AMS or impose administrative penalties.

Project Site

Study Intersection

N:\Projects\2019_Projects\SF19-1076_499ForbesBlvd\Graphics\AI

Figure 1-1

Project Location

2. Environmental Setting

This section describes the existing transportation and circulation setting in the vicinity of the project site: the existing roadway network, transit network and service, pedestrian conditions, and bicycle conditions. A description of agencies with jurisdiction over transportation in South San Francisco and a summary of relevant plans and policies are provided in **Appendix B**.

2.1 Roadway Facilities

The project site is at the southwest corner of the Oyster Point Boulevard and Gateway Boulevard intersection in the City of South San Francisco's East of 101 employment area. Regional access to the project site is provided via US-101 and Oyster Point Boulevard to the north and, and US-101 and East Grand Avenue to the south. Relevant roadway plans and policies (e.g. South San Francisco General Plan, East of 101 Mobility 20/20 Plan, South San Francisco Complete Streets Plan) are discussed in **Appendix B**. **Figure 1-1** shows the Project location, study intersections, and the surrounding roadway system. Project site vehicular access is provided via two, two-way driveway that intersects Gateway Boulevard South of Oyster Point Boulevard. A dedicated pedestrian walkway parallels the driveway.

Study intersections are summarized in **Appendix C** and listed below:

1. Gateway Boulevard / Gateway Business Park Driveway
2. Airport Boulevard / Grand Avenue
3. Gateway Boulevard / East Grand Avenue
4. Gateway Boulevard / Corporate Driveway
5. Dubuque Avenue / Oyster Point Boulevard
6. Gateway Boulevard / Oyster Point Boulevard
7. Airport Boulevard / Sister Cities Boulevard
8. Dubuque Avenue / US-101 Off-ramp

Key local roadways in the vicinity of the project site are described below:

- *US-101* is an eight-lane freeway and principle north-south roadway connection between San Francisco, San Jose, and intermediate San Francisco Peninsula cities. In South San Francisco, US-101 is located approximately one mile west of the project site and serves the East of 101 area with three primary access points. Near the project site, US-101 carries about 220,000 vehicles per day and defines the East of 101 area's western edge and barrier to east-west bicycle and pedestrian connectivity. Access points include:
    - *Southern Access – Gateway Boulevard*: Northbound on- and off-ramps are at South Airport Boulevard/Wondercolor Lane; southbound on- and off-ramps are immediately south of the San Mateo Avenue/Produce Avenue/South Airport Boulevard intersection.
    - *Central Access – East Grand Avenue:* Northbound off-ramps are at East Grand Avenue/Poletti Way and on-ramps are to the west at Grand Avenue/Airport Boulevard. Southbound off-ramps are at Airport Boulevard/Miller Avenue. There is no southbound freeway access at this location.

  - *Northern Access – Oyster Point Boulevard:* Northbound on- and off-ramps intersect Dubuque Avenue at and immediately south of Oyster Point Boulevard. Southbound on-ramps are at Dubuque Ave, adjacent to the Northbound off-ramp. The southbound off-ramp intersects Gateway Boulevard / Oyster Point Boulevard as the intersection's fifth leg.

- *East Grand Avenue* is an east-west arterial street. It has six travel lanes west of Gateway Boulevard, and four travel lanes east of Gateway Boulevard and two travel lanes east of Haskins Way. US-101 freeway ramps at East Grand Avenue enable Project access from the south. East Grand Avenue carries about 17,000 vehicles per day.
- *Airport Boulevard* runs roughly parallel to US-101 in South San Francisco. Freeway ramps south of Grand Avenue provide alternate Project access from the south. Airport Boulevard carries approximately 24,000 vehicles per day.
- *Gateway Boulevard* is a four-lane north-south arterial connecting East Grand Avenue with South Airport Boulevard and Oyster Point Boulevard. Class II bicycle lanes exist between East Grand Avenue and So. Airport Boulevard. The corridor provides Project access from the north via US-101 ramps at Oyster Point Boulevard. Gateway Boulevard carries approximately 12,000 vehicles per day.

2.2 Transit Facilities and Service

The project site is not served directly by regional rail, ferry, or bus transit services; however, regional rail service (Caltrain and BART), ferry service (WETA), and bus service (SamTrans) is provided in the greater vicinity of the project site. BART and Caltrain stations and the WETA ferry terminal are located at a walking distance of approximately 2, 0.75, and 1 mile(s), respectively. No SamTrans bus service exists east of US-101 in South San Francisco at this time. The project site therefore relies on supplementary public shuttle services to connect employees with regional transit. Relevant transit plans and policies (e.g. South San Francisco General Plan, East of 101 Mobility 20/20 Plan, Caltrain Business Plan) are discussed in **Appendix B**. The existing transit services are shown on **Figure 2-1**and described in detail below.

2.2.1 Regional Transit Service

The following transit services operate within South San Francisco and are accessible from the project site with a bicycle or first- and last-mile shuttle connection provided by Commute.org:

- *Bay Area Rapid Transit (BART)* provides regional rail service between the East Bay, San Francisco, and San Mateo County, connecting between San Francisco International Airport and Millbrae Intermodal Station to the south, San Francisco to the north, and Oakland, Richmond, Pittsburgh/Bay Point, Dublin/Pleasanton and Fremont in the East Bay. The South San Francisco Station is located approximately three miles west of the project site at Mission Road and McLellan Drive. The San Bruno Station is located approximately two miles southwest of the project site near The Shops at Tanforan. BART trains operate on 15-minute headways during peak hours, and 20-minute headways during off-peak hours.
- *Caltrain* provides passenger rail service on the Peninsula between San Francisco and San Jose, and limited service trains to Morgan Hill and Gilroy during weekday commute periods. The South San

Francisco Caltrain Station is currently located approximately 0.75 miles south of the project site at 590 Dubuque Avenue, on the east side of US-101, immediately north of East Grand Avenue. By the end of 2020, Caltrain plans to relocate the South San Francisco Caltrain Station several hundred feet to the south near the East Grand Avenue/Airport Boulevard intersection and provide more direct pedestrian access to the East of 101 area via a tunnel with access at East Grand Avenue and Poletti Way. The South San Francisco Caltrain Station serves local and limited trains, with 23 northbound and 23 southbound weekday trains. The South San Francisco Caltrain Station provides weekday service from 5:40 AM to 12:00 AM, with approximately 30-minute headways during peak times and 60-minute headways during off-peak times.

- *Water Emergency Transportation Authority (WETA)* provides weekday commuter ferry service between Oakland/Alameda ferry terminals and the South San Francisco Ferry Terminal at Oyster Point. There are three morning departures from Oakland/Alameda to South San Francisco, and three evening departures from South San Francisco to Oakland/Alameda. The South San Francisco Ferry terminal is located approximately one mile from the project site.
- *San Mateo County Transit District (SamTrans)* provides bus and rail service (through Caltrain) in San Mateo County but does not serve the East of 101 employment area. The closest bus stops to the project site are approximately 0.6 miles to the northwest near the intersection of Airport Boulevard and Sister Cities Boulevard and are served by Routes 292 and 397.

2.2.2 East of 101 Commuter Shuttle Service

Peninsula Traffic Congestion Relief Alliance (Commute.org) shuttles provide weekday commute period first/last mile connections between BART and Caltrain stations and the WETA ferry terminal and local employers in the East of 101 Area, including the project site. Six weekday peak period, peak-direction routes serve the East of 101 area and are described in **Table 2.1**. Service is roughly distributed between the East of 101 area's north (Oyster Point area) and south (Utah/Grand area) geographic halves. Project shuttle access is provided by an existing stop 0.2 miles away at the intersection of Oyster Point Boulevard and Gateway Boulevard which is served by all Oyster Point area shuttles. These routes connect with Caltrain, BART, and the WETA ferry terminal.

Table 2.1. East of 101 Area Commute.org Shuttle Service

Service Area	Regional Transit Connection	Peak Period Headway (minutes)	Total Daily Weekday Trips	
			AM (6:30-10:00)	PM (3:00-6:00)
Oyster Point	Caltrain	30-40	7	7
	Ferry Terminal	20-60	3	3
	BART	15-30	10	9
Utah/Grand	Caltrain	30-40	8	7
	Ferry Terminal and Caltrain	30-60	4	3
	BART	30	8	7

Note: Highlighted text denotes service that is walking distance to the project site from an existing shuttle stop.

Caltrain Station and Alignment
Commute.org Shuttle Routes and Stops
SamTrans Routes
South San Francisco Ferry Terminal
Project Site

N:\Projects\2019_Projects\SF19-1078_751 Gateway EIR\Graphics

Figure 2-1
Transit Facilities

2.3 Pedestrian Facilities

Pedestrian facilities include sidewalks, crosswalks, trails, and pedestrian signals. In the Project vicinity, continuous sidewalks exist along both sides of Gateway Boulevard except South of Larkspur Landing driveway, where continuous sidewalks exist on the east side of the roadway for intermittent sections to East Grand Avenue.

At the intersection of Oyster Point Boulevard and Gateway Boulevard (a signal-controlled intersection immediately adjacent to the project site), marked crosswalks are provided on two of the four intersection legs. Sidewalks exist on the north side of Oyster Point Boulevard, which provides continuous pedestrian connectivity between the project site and the nearest existing Commute.org shuttle stop.

A segment of the San Francisco Bay Trail runs along the shoreline in the East of 101 area, providing a continuous off-street shared-use trail connection between Brisbane's Sierra Point to the north and South Airport Boulevard at the San Bruno Canal to the south. The Bay Trail is a public pedestrian and bicycle trail that is planned to extend around the entire San Francisco Bay. To the north of the project site, the Bay Trail connects to the South San Francisco Ferry Terminal to Oyster Point Boulevard, allowing bicyclists and pedestrians to access the Ferry Terminal. Currently, there are gaps in the trail to the north of Brisbane, and just south of South San Francisco.

Relevant pedestrian plans and policies (e.g. South San Francisco General Plan, East of 101 Mobility 20/20 Plan, South San Francisco Pedestrian Master Plan) are discussed in **Appendix B**.

2.4 Bicycle Facilities

Bicycle facilities consist of separated bikeways, bicycle lanes, routes, trails, and paths, as well as bike parking, bike lockers, and showers for cyclists. Caltrans recognizes four classifications of bicycle facilities:

- Class I – Shared-Use Pathway: Provides a completely separated right-of-way for the exclusive use of cyclists and pedestrians with crossflow minimized (e.g. off-street bicycle paths).
- Class II – Bicycle Lanes: Provides a striped lane for one-way travel on a street or highway. May include a "buffer" zone consisting of a striped portion of roadway between the bicycle lane and the nearest vehicle travel lane.
- Class III – Bicycle Route: Provides for shared use with motor vehicle traffic; however, are often signed or include a striped bicycle lane.
- Class IV – Separated Bikeway: Provides a right-of-way designated exclusively for bicycle travel adjacent to a roadway and which are protected from vehicular traffic. Types of separation include, but are not limited to, grade separation, flexible posts, inflexible physical barriers, or on-street parking.

The area surrounding the project site has a partially complete bicycle network that provides first- and last-mile connectivity to the South San Francisco Ferry Terminal but lacks dedicated bicycle connections to the Caltrain station and residential and commercial uses west of US-101. Current bicycle facilities in the Project vicinity, as designated by the South San Francisco Bicycle Master Plan (2011) and the draft Active South City Bicycle and Pedestrian Master Plan (ongoing), are shown in **Figure 2-2**, and discussed below.

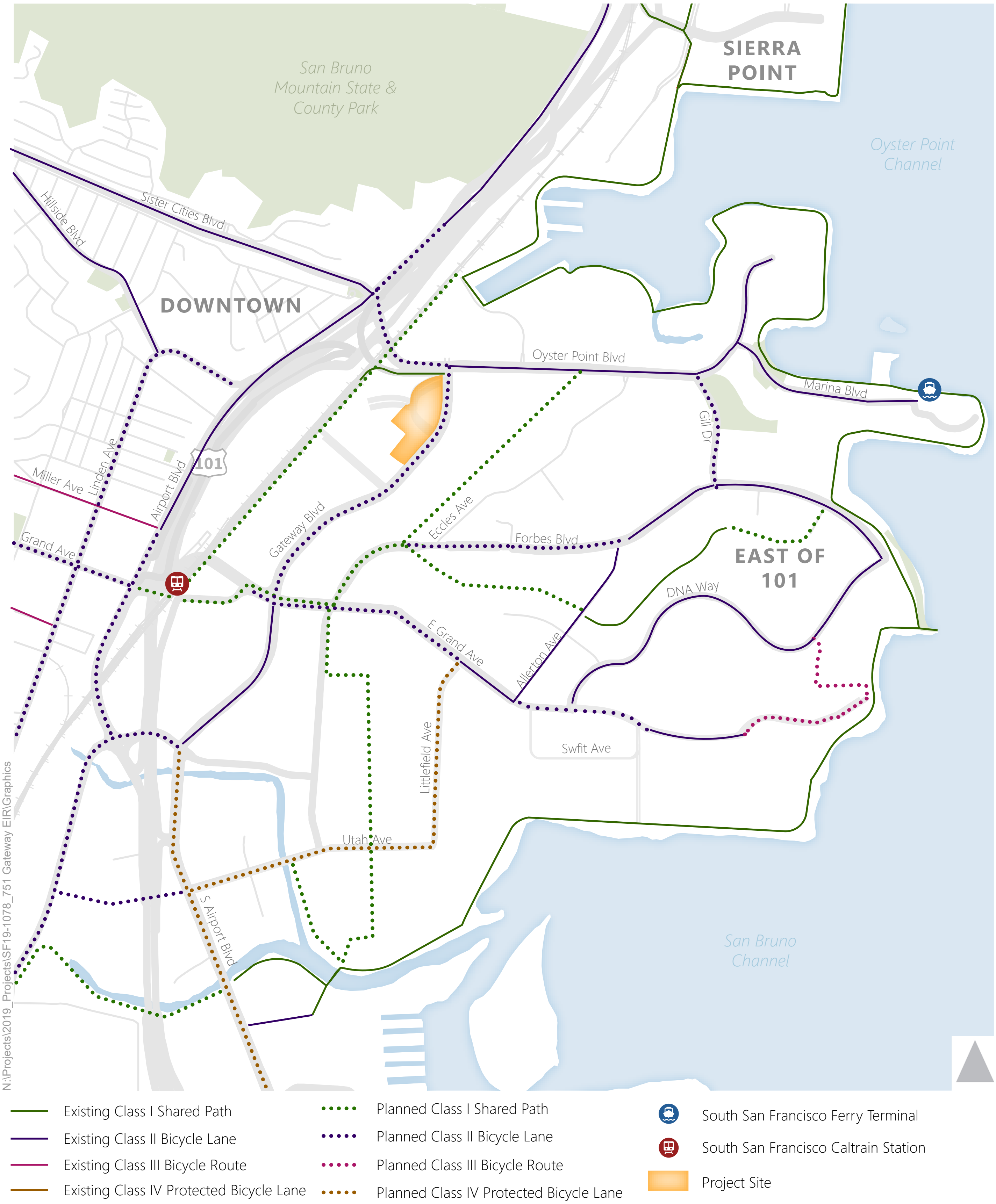


Figure 2-2

Bicycle Facilites

- *Gateway Boulevard* has proposed Class II bicycle lanes between Oyster Point Boulevard and East Grand Avenue to connect to existing bicycle lanes on both roads; proposed bicycle lanes on Gateway Boulevard will provide direct access to the project site.
- *Poletti Way* has a short Class I mixed-use trail connection from the street's terminus to the Oyster Point Boulevard/Gateway Boulevard intersection; an extension of the trail is planned to the new Caltrain station to the south and the Bay Trail to the north (under the Oyster Point Boulevard overpass).
- *Oyster Point Boulevard* has Class II bicycle lanes between Gull Drive and Gateway Boulevard; Class II bicycle lanes are planned for the remainder of Oyster Point Boulevard to connect to existing bicycle lanes on Sister Cities Boulevard and Airport Boulevard.
- *East Grand Avenue* has intermittent Class II bicycle lanes in the East of 101 Area. A Class I trail is planned and will connect the new Caltrain station with planned trails near Forbes Boulevard, while Class II bicycle lanes are expected to be installed from Gateway Boulevard to DNA Way by summer 2020.
- *The San Francisco Bay Trail (Bay Trail)* is a Class I mixed-use trail along the Oyster Point shoreline and Point San Bruno, part of a planned 400-mile regional trail system encircling the San Francisco Bay shoreline.

Bicyclists primarily access the project site via Gateway Boulevard, Poletti Way, Oyster Point Boulevard, East Grand Avenue, and/or the Bay Trail. Commute trip lengths, lack of continuous low stress bicycle facilities, lack of connectivity to residences and transit stations, and topography present barriers to bicycle commuting to the East of 101 area today.

As noted in the prior section, the reconstructed South San Francisco Caltrain station features a bicycle and pedestrian undercrossing that connects the East of 101 area to the upgraded South San Francisco Caltrain station, Downtown South San Francisco, housing, and commercial services to the west. The undercrossing represents the first non-motorized connection spanning the Caltrain and US-101 corridors, which are substantial barriers to east-west bicycle and pedestrian travel.

Additional relevant bicycle plans and policies (e.g. South San Francisco General Plan, East of 101 Mobility 20/20 Plan, South San Francisco Bicycle Master Plan) are discussed in **Appendix B**.

2.5 Emergency Vehicle Access

Emergency vehicles typically use major streets through the study area when heading to and from an emergency and/or emergency facility. Arterial roadways allow emergency vehicles to travel at higher speeds and provide enough clearance space to permit other traffic to maneuver out of the path of the emergency vehicle and yield the right-of-way. The project site is located approximately one mile north of South San Francisco Fire Station 62 which is located at 249 Harbor Way. Emergency vehicle access to the project site is primarily from the two driveways on Gateway Boulevard, which has two travel lanes in each direction.

3. Transportation Analysis

This section includes analysis and findings of Project effects on transportation services and facilities, including motor vehicle travel and operations, transit service, pedestrian facilities, and bicycle facilities. The amount and distance of motor vehicle travel was analyzed using vehicle miles traveled (VMT),[2] while the motor vehicle operations analysis focused on weekday AM and PM peak hour queue conditions at freeway off-ramps. Other vehicle operations measures, such as level of service (LOS), are presented in **Appendix C** for informational purposes. Bicycle, pedestrian, and transit impacts were qualitatively assessed using transportation planning and engineering methods and practices.

3.1 Significance Criteria

The impacts of the Project related to transportation would be considered significant if any of the following Standards of Significance are exceeded, in accordance with Appendix G of the California Environmental Quality Act (CEQA) Guidelines:

- Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities;
- Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b) related to VMT;
- Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment); or
- Result in inadequate emergency access.

City of South San Francisco and City/County Association of Governments of San Mateo County (C/CAG) guidance was used to identify additional relevant thresholds of significance to determine whether implementation of the Project would result in significant environmental impacts and are described below.

The criteria of significance apply to all Project scenarios as measured against the corresponding No Project scenario.

3.1.1 Vehicle Miles Traveled (VMT)

As a part of *Shape SSF,* the City of South San Francisco's General Plan Update, the City is updating its transportation impact thresholds. By July 1st, 2020, the City will adopt a VMT threshold in accordance with the Office of Planning and Research (OPR)'s guidance in implementing Senate Bill 743. Since the City has not yet adopted such a VMT threshold, an interim Project threshold was developed based on the metrics and methods described in **Appendix A**, Vehicle Miles Traveled Technical Overview. Analysis of greenhouse gas reduction goals performed by the California Air Resources Board (CARB) indicates that a

[2] The Governor's Office of Planning and Research (OPR) has established new metrics for determining the significance of transportation impacts with VMT as the preferred transportation impact metric and applied their discretion to require its use statewide, as described in more detail in **Appendix A**.

reduction of at least 16.8 percent of light-duty vehicle VMT is necessary to reach statewide goals.[3] Light-duty VMT is appropriate for the Project because most Project trips are expected to be light duty vehicles (such as personal automobiles used for commuting).

Home-based work VMT (HBW VMT) per employee was identified as the Project analysis metric. This metric follows OPR guidance for measuring office project VMT and helps compare the Project's relative transportation efficiency to the regional average. OPR recommends using a regional geography for office projects. Neither the local city or county level geographic area is robust enough to capture the full length of most trips or evaluate the interaction of the Project in a regional setting, as many commute trips exceed the city and county borders. Accordingly, the nine-county Bay Area region was selected as the geographic boundary for the assessment (as shown in **Table 3.1**).

- A significant impact would occur should existing HBW VMT per employee in the travel demand model transportation analysis zone (TAZ) that encompasses the project result in greater than 11.8 HBW VMT per employee under existing conditions, based on a reduction of 16.8 percent below the existing regional average of 14.2 HBW VMT per employee as shown in **Table 3.1.**
- A significant impact would occur should cumulative HBW VMT per employee in the travel demand model transportation analysis zone (TAZ) that encompasses the project result in greater than 12.1 HBW VMT per employee under cumulative conditions, based on a reduction of 16.8 percent below the cumulative regional average of 14.6 HBW VMT per employee as shown in **Table 3.1.**

Table 3.1 Home-Based Work (HBW) VMT Per Employee – Thresholds

Location	Total HBW VMT *(a)*	Total Employees *(b)*	HBW VMT per Employee *(a) / (b)*	VMT per Employee Threshold *(16.8% Reduction)*
Bay Area Region, Existing	63,336,200	4,461,670	14.2	11.8
Bay Area Region, 2040 Cumulative	78,980,240	5,406,190	14.6	12.1

Source: Fehr & Peers 2020; C/CAG-VTA Bi-County Transportation Demand Model, 2019.

3.1.2 Freeway Ramp Queuing

While SB 743 notes that "traffic congestion shall not be considered a significant impact on the environment" the freeway on- and off-ramp vehicle queuing criteria was retained to assess potential hazards from Project traffic exceeding ramp storage capacities. Traffic in queue represents congested,

[3] California Air Resources Board, *2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals*, January 2019. Available online at https://ww2.arb.ca.gov/resources/documents/carb-2017-scoping-plan-identified-vmt-reductions-and-relationship-state-climate

stop-and-go conditions, and should queues interfere with through, free-moving traffic streams on the freeway mainline, hazards could arise due to the differences in speed.

- A significant impact would occur if the Project causes vehicle queues approaching a given movement downstream of Caltrans freeway facilities to exceed existing storage space for that movement or would considerably contribute to baseline vehicle queues that exceed storage space for that movement, resulting in a hazardous condition.

3.1.3 Bicycle, Pedestrian, and Transit

- A significant impact would occur if Project traffic would produce a detrimental impact to existing bicycle or pedestrian facilities, or conflict with adopted plans and programs.
- A significant impact would occur if Project traffic would produce a detrimental impact to local transit or shuttle service or conflict with adopted plans and programs.

3.1.4 Hazards

- A significant impact would occur if the Project substantially increases hazards due to a geometric design feature.
- A significant impact would occur if the Project substantially increases hazards by introducing an incompatible land use.

3.1.5 Emergency Access

- A significant impact would occur if the project would result in inadequate emergency access.

3.2 Analysis Scenarios

The impacts of the Project to the surrounding transportation system were evaluated for the four scenarios listed below:

Scenario 1: Existing Conditions
Scenario 2: Existing Plus Project Conditions
Scenario 3: Cumulative Conditions
Scenario 4: Cumulative Plus Project Conditions

A description of the methods used to estimate the amount of traffic and VMT generated by the Project is provided below. Project-specific impacts are described under Section 4, Project Impacts and Mitigation Measures.

3.2.1 Existing Conditions

Existing conditions represent the baseline condition upon which Project impacts are measured. The baseline condition represents existing conditions as of 2019.

3.2.2 Existing Plus Project Conditions

Existing Plus Project conditions represent the baseline condition with the addition of the Project. Traffic volumes for Existing Plus Project conditions include existing traffic volumes plus traffic generated by the Project. Existing Plus Project conditions were compared to Existing conditions to determine potential immediate project impacts.

3.2.3 Cumulative Conditions

Cumulative conditions include transportation demand resulting from reasonably foreseeable land use changes and conditions associated with funded transportation projects at year 2040. Cumulative conditions are based on land use and transportation conditions included in Plan Bay Area 2040, as represented in the C/CAG-VTA Bi-County Transportation Demand Model (C/CAG model). The C/CAG model is a four-step trip-based travel demand model designed to forecast how land uses and transportation interact within San Mateo and Santa Clara Counties.

3.2.4 Scenario 4: Cumulative Plus Project Conditions

Cumulative Plus Project conditions represent the cumulative condition with the addition of the Project to determine the extent to which the Project would contribute to long-term cumulative transportation impacts.

3.3 Vehicle Miles Traveled

Project-generated HBW VMT per employee is calculated based on average HBW VMT generated by employees working in the C/CAG travel demand model transportation analysis zone (TAZ) where the Project is located, divided by the number of jobs within the TAZ, as described in more detail in **Appendix A**. A TAZ is the smallest resolution available in the C/CAG model – somewhere between a census block group and a census tract in size. Each TAZ included in the model contains information related to the existing and proposed land uses and transportation options for zone. Therefore, the transportation properties of the Project's TAZ are an appropriate proxy for transportation properties of the Project itself.

Based on this methodology, the Project would generate 16.2 HBW VMT per employee under existing conditions. This total is above the regional average total of 14.2 HBW VMT per employee under existing conditions and is also above the VMT per employee threshold of 11.8 HBW VMT per employee under existing conditions (which represents the reduction of 16.8% below the existing regional average HBW VMT per employee).

The Project would generate 14.0 HBW VMT per employee under cumulative 2040 conditions. This total is similar to the cumulative regional average total of 14.6 HBW VMT per employee. The Project would generate HBW VMT per employee above the VMT per employee threshold of 12.1 BHW VMT per employee under cumulative conditions (which represents the reduction of 16.8% below the cumulative regional average HBW VMT per employee). The C/CAG model variables are presented in **Table 3.2**.

As discussed in Section 1, Project Description, the Project is required to include an TDM program designed to achieve a 35-40 percent non-drive alone mode share during peak periods under the City's current TDM requirements and policy direction to reduce single-occupancy vehicle trips, which represent an approximately six percent reduction in non-drive alone mode share from baseline conditions (29%).[4] However, reductions in non-drive alone mode share are not necessarily interchangeable with VMT reductions on a percentage point for percentage point basis. This is due to several reasons. First, mode share targets do not necessarily correlate with trip generation and trip length: although many East of 101 employers meet their non-drive alone mode share targets, vehicle trip generation and trip lengths are similar to (if not slightly higher than) regional averages based on the C/CAG travel demand model outputs. Second, a non-drive alone mode share target includes passenger vehicle-based modes such as vanpools and carpools, which may dilute its effectiveness for VMT reductions. Third, VMT is a measure of daily activity for all trips, whereas accounting of non-drive alone mode share targets focuses only on commute trips. Therefore, Project HBW VMT per employee was not adjusted based on the Project TDM plan.

Table 3.2 Home-Based Work (HBW) VMT Per Employee – East of 101

Location	Total HBW VMT *(a)*	Total Employees *(b)*	HBW VMT per Employee *(a) / (b)*	VMT per Employee Threshold
East of 101 Area, Existing	581,977	35,831	16.2	11.8
East of 101 Area, 2040 Cumulative	1,975,199	736,810	14.0	12.1

Source: Fehr & Peers 2020; C/CAG-VTA Bi-County Transportation Demand Model, 2019.

The Project's effect on VMT describes changes in VMT generation from neighboring land uses by comparing area VMT for "no project" and "plus project" scenarios. Given the similarities in the Project land uses to those of the surrounding land uses (e.g., location that generates higher than average VMT for the region, single-use employment centers, and limited non-auto access), the analysis of Project-generated HBW VMT per employee based on East of 101 Area VMT provides a reasonable estimation of the environmental consequences associated with the Project's effect on VMT.

Overall, the existing land use and transportation characteristics of the East of 101 area contribute to the East of 101 Area's higher-than-average VMT per employee. As a single-use employment center, all home-based trips begin or end outside the East of 101 area, requiring longer travel along auto-oriented roadways or via transit service that is currently not competitive with the automobile. In contrast, mixed-use settings near transit can reduce trip generation and trip lengths while increasing the use of non-auto modes.

[4] 2012-2016 five-year American Community Survey commute mode share estimates for the East of 101 employment area. Accessed via the Census Transportation Planning Products (CTPP).

3.4 Trip Generation, Distribution, and Assignment

The amount of traffic added to the roadway system by the Project was estimated using a three-step process: (1) trip generation, (2) trip distribution, and (3) trip assignment. The first step estimates the amount of traffic that would be generated once the Project was built and fully occupied. The second step estimates the direction of travel to and from the project site. The third step assigns the Project trips to specific street segments and intersection turning movements. The results are described below.

3.4.1 Project Trip Generation

Project traffic added to the surrounding roadway system was estimated using data collected in Fall 2019 for the existing office and research and development (R&D) campus adjacent to the project site. Local travel demand data was used instead of national averages because of the unique conditions in the East of 101 area, including peak period spreading, employment land use mix, and higher rates of participation in TDM programs. In contrast, national trip generation databases such as the Institute of Transportation Engineers' (ITE) *Trip Generation Manual* is generally collected at suburban sites with limited non-auto access and less congestion.

Driveway count data was collected at nine driveways at the surrounding office/R&D campus representing trip generation for nine existing buildings[5] and 1.4 million square feet. A trip generation rate for the existing uses was developed and applied to the Project square footage to calculate Project travel demand. The sample site driveway traffic data is presented in **Appendix C**.

The Project trip generation rate was derived from the site-specific data and multiplied by the size of the Project (gross square feet) to determine daily and weekday morning and evening peak hour vehicle trip generation volume, shown in **Table 3.3**. Vehicle trips are summarized for the entire project site (including both the existing 701 Gateway building, which would remain, and the proposed 751 Gateway building), and for each building individually. The net new Project trips are for the proposed 751 Gateway only and subtract existing trips associated with the existing 701 Gateway building from the project site trips. According to this trip generation analysis, the new 208,800 square foot office building would generate approximately 1,784 daily, 206 AM peak hour (143 inbound and 64 outbound), and 172 PM peak hour (45 inbound and 127 outbound) net new trips.

[5] The nine existing buildings on the Gateway Campus include a combination of office, R&D, and lab land uses at the following addresses: 681, 685, 701, 601, 611, 651, 801, 901, and 951 Gateway Boulevard.

Table 3.3 Project Trip Generation

Land Use	Size (KSF)	Daily		AM Peak Hour				PM Peak Hour			
		Total	Rate	In	Out	Total	Rate	In	Out	Total	Rate
Total Trips for the project site (701 & 751 Gateway Boulevard buildings)	382.3	3,267	8.6	262	116	378	0.99	82	232	315	0.82
Existing Trips for the 701 Gateway Boulevard building, which would remain	173.5	1,483		119	53	172		37	105	143	
Net New Trips for the proposed 751 Gateway Boulevard building	208.8	1,784		143	64	206		45	127	172	

Notes:
1. Trip Generation rates based on 2019 driveway count data collected at the Gateway Campus in the East of 101 area.

Source: Fehr & Peers 2020

3.4.2 Project Trip Distribution

The directions of approach and departure for the Project traffic were estimated based on C/CAG's Travel Demand Model and the City of South San Francisco's Travel Demand Model, which has greater sensitivity to local travel patterns. **Figure 3-1,** Project Trip Distribution, shows the general trip distribution pattern for the Project. Most of the Project traffic is split between the north (33%) and south (49%) US-101 approaches to the East of 101 area. Within South San Francisco, approximately 16 percent of Project traffic is projected to come from west of US-101, while 2 percent is expected to come from within the East of 101 area.

3.4.3 Project Trip Assignment

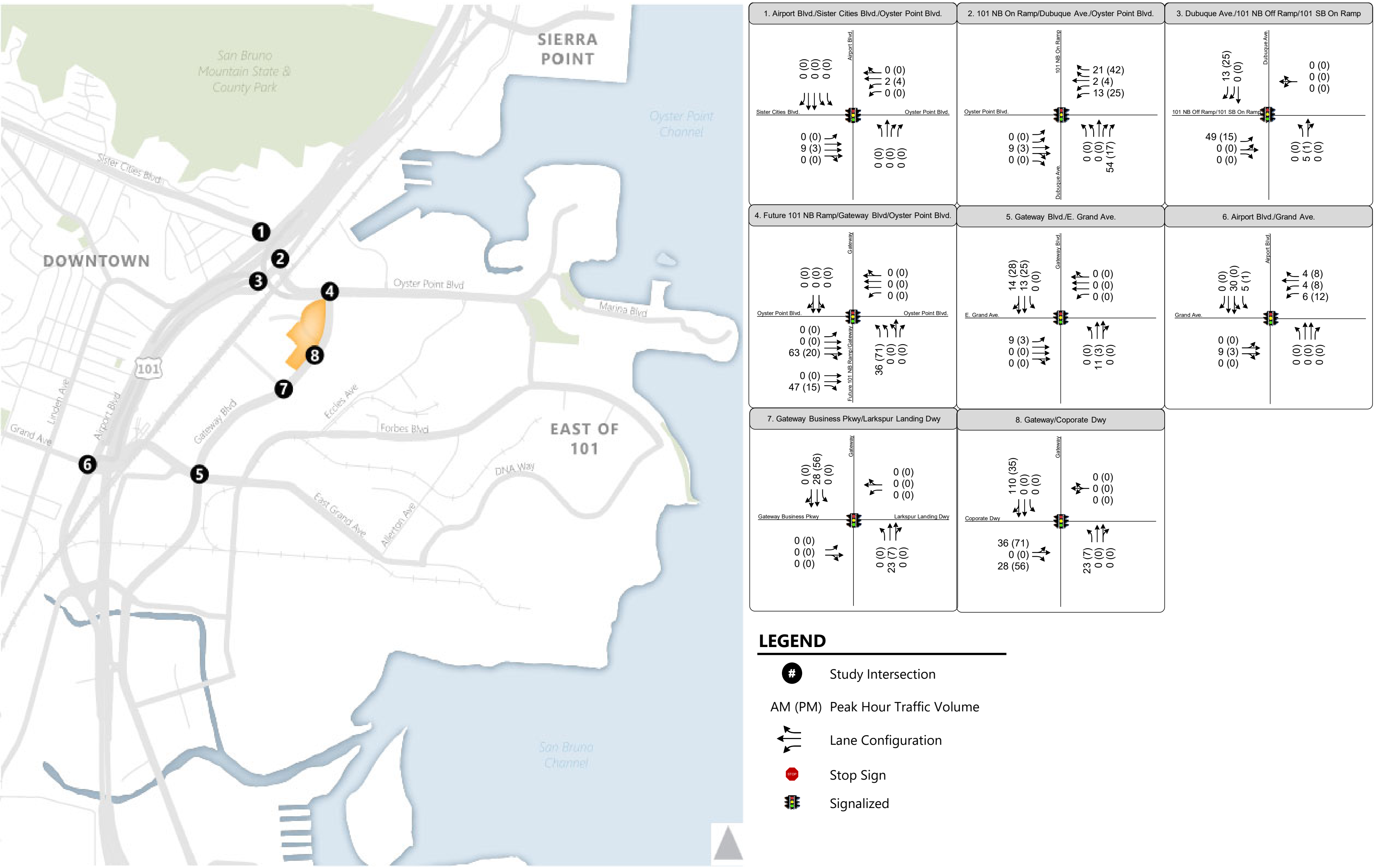
The Project trips were assigned to the roadway system based on the directions of approach and departure discussed above. The locations of complimentary land uses and local knowledge of the study area helped determine specific trip routes. **Figure 3-2** shows the expected increases in peak hour intersection turning movement volume due to the Project.

Project traffic would access the roadway network via two driveways along the Gateway Boulevard frontage, to the South of Oyster Point Boulevard. Inbound vehicular traffic accesses the project site via Gateway Boulevard from both sides and outbound traffic departs via Gateway Boulevard in the opposite direction.

N:\Projects\2019_Projects\SF19-1076_499ForbesBlvd\Graphics\AI

Figure 3-1

Project Trip Distribution



LEGEND

#	Study Intersection
AM (PM)	Peak Hour Traffic Volume
	Lane Configuration
	Stop Sign
	Signalized

Figure 3-2
Project Trip Assignment

3.5 Freeway Ramp Queueing Analysis

Three freeway off-ramps were selected for analysis based on local traffic patterns, Project trip assignment forecasts, input from the City of South San Francisco, and engineering judgment, to assess conditions where the addition of Project trips may result in hazards to road users. The study locations are listed below.

1. US-101 Southbound Off-Ramp at Oyster Point Boulevard
2. US-101 Northbound Off-Ramp at East Grand Avenue
3. US-101 Northbound Off-Ramp at Dubuque Avenue

Traffic counts were collected at the approaches and departures to the three freeway off-ramps during the morning (7:00 AM to 9:00 AM) and evening (4:00 PM to 6:00 PM) peak periods in November 2019. During all counts, weather conditions were generally dry, no unusual traffic patterns were observed, and the South San Francisco Unified School District was in regular session.

Table 3.4 presents weekday AM peak hour vehicle queues at the three US-101 off-ramp study locations. The AM peak hour was selected as the analysis period since the Project, and the East of 101 area generally generate the majority of "inbound" trips during the AM peak period where inbound trips would be using the freeway off-ramps. Conversely, during the PM peak period, study off-ramps have significantly lower volumes and very few project trips would use the off-ramps. Therefore, the off-ramps queuing analysis during the AM peak hour is expected to encompass all potential impacts. The Project would extend or contribute to queues longer than storage distances at study location #1, the US-101 Southbound Off-Ramp at Oyster Point Boulevard. Specifically, the queue would spill back from the eastbound right turn lane approaching the Oyster Point Boulevard / Gateway Boulevard Intersection. However, the queue would not interfere with the US-101 freeway mainline as the combined right turn and through queue lengths are less than the overall 3,100-foot ramp storage distance. The Project therefore would not result in a hazardous condition at this location.

Cumulative Plus Project traffic volumes are presented in **Appendix C** and the volume relevant to the freeway ramp queuing assessment is presented in **Table 3.5**. The Project would extend or contribute to queues longer than storage distances at study location #1, the US-101 Southbound Off-Ramp at Oyster Point Boulevard. Specifically, the queue would spill back from the eastbound right turn lane approaching the Oyster Point Boulevard / Gateway Boulevard Intersection. However, similar to under Existing Plus Project conditions, the queue would not interfere with the US-101 freeway mainline as the combined right turn and through queue lengths are less than the overall 3,100-foot ramp storage distance. Cumulative Plus Project traffic therefore would not result in a hazardous condition at this location.

Table 3.4 Existing Weekday AM Peak Hour 95th Percentile Queues

Approach Lanes	Storage Distance	Existing		Existing Plus Project	
		Volume	Queue Length	Volume	Queue Length
1. US-101 Southbound Off-Ramp at Oyster Point Boulevard (AM Peak)					
Through	3,100	704	**513**	704	**513**
Right	350	319	**547**	366	**650**
2. US-101 Northbound Off-Ramp at East Grand Avenue (AM Peak)					
Left	1,775	131	200	131	200
Right	1,775	639	1,020	639	1,020
3. US-101 Northbound Off-Ramp at Dubuque Avenue (AM Peak)					
Left/Through	1,000	891	365	940	386
Right	300	74	27	74	27

Notes: Bold type indicates conditions where queue length exceeds intersection movement capacity. Queues do not take into account downstream spillover from adjacent intersections. Storage distance and queues in feet per lane. Source: Fehr & Peers, 2020

Table 3.5 Cumulative Weekday AM Peak Hour 95th Percentile Queues

Approach Lanes	Storage Distance	Cumulative		Cumulative Plus Project	
		Volume	Queue Length	Volume	Queue Length
1. US-101 Southbound Off-Ramp at Oyster Point Boulevard (AM Peak)					
Through	3,100	1,813	**1,553**	1,813	**1,553**
Right	350	654	**1,162**	701	**1,255**
2. US-101 Northbound Off-Ramp at East Grand Avenue (AM Peak)					
Left	1,775	216	330	216	330
Right	1,775	683	1,090	683	1,090
3. US-101 Northbound Off-Ramp at Dubuque Avenue (AM Peak)					
Left/Through	1,000	425	1,317	1,366	442
Right	300	22	374	74	321

Notes: Bold type indicates conditions where queue length exceeds intersection movement capacity. Queues do not take into account downstream spillover from adjacent intersections. Storage distance and queues in feet per lane. Source: Fehr & Peers, 2020

3.6 Bicycle, Pedestrian, and Transit

The Project would generate additional vehicle trips adjacent to existing sidewalks and bicycle facilities and would generate some new walking and bicycling trips. However, the Project would not worsen existing or planned bicycle or pedestrian facilities. The project would not create inconsistencies with adopted bicycle or pedestrian system plans, guidelines, or policy standards, as described in Appendix B.

The Project includes both long-term protected (class I and short-term (class II) bicycle parking spaces in compliance with the City's code requirements. Class I bicycle parking spaces are typically lockers or restricted access parking rooms and are intended for employees. Class II bicycle parking spaces are standard bike racks and are mostly intended for visitors. Bike racks should be located near entrances where they are highly visible.

The Project would generate vehicle trips in the vicinity of existing transit services and would generate some new transit trips to existing routes. Commute.org shuttles travel along the Project's frontage on Gateway Boulevard and Caltrain operates less than one mile from the project site. The addition of 206 vehicle trips during the AM peak hour, or three to four new vehicles per minute, would not create a disruption to transit service surrounding the project site. Project-added vehicle trips represent approximately three percent of entering volumes at study intersections during the AM and PM peak hours. The Project may add net new transit trips to both Caltrain and Commute.org shuttles, but both operators are expected to be able to handle the additional ridership either through existing available capacity. The Project would not include features that would disrupt existing or planned transit routes or facilities. The Project's driveways would not cause disruptions to existing or planned transit service or transit stops. The Project would not conflict with any adopted transit system plans, guidelines, policies, or standards, as described in Appendix B.

The Project's effects under cumulative 2040 conditions would be similar to that of existing conditions. Improvements to Caltrain via the Peninsula Corridor Electrification Project and the South San Francisco Station Improvement Project would provide enhanced connectivity and capacity to accommodate project trips. There are no fully funded changes to bicycle, pedestrian, or transit conditions adjacent to the Project site.

4. Impacts and Mitigations

This section includes the evaluation of the Project's potential impacts under Existing Plus Project and Cumulative Plus Project conditions. This section also describes the associated mitigation measures required by the Project.

4.1 Vehicular Traffic

This section includes the evaluation of the Project's potential VMT and freeway ramp queuing impacts.

4.1.1 Vehicle Miles Traveled

Impact TRANS-1: **Home-based work (HBW) vehicle miles traveled (VMT) per employee in the travel demand model transportation analysis zone (TAZ) that encompasses the project result in greater than 16.8 percent below the regional average HBW VMT per employee under Existing Plus Project and Cumulative Plus Project conditions. (*Significant; Significant and Unavoidable*)**

As documented in Section 3.3, using the average VMT in the East of 101 area, the Project would generate approximately 16.2 HBW VMT per employee under existing conditions, which is greater than the per-employee significance threshold of 11.8 HBW VMT (based on a VMT rate 16.8 percent below the regional average of 14.2 HBW VMT per employee). Therefore, the Project would have a significant impact on VMT under Existing Plus Project conditions.

Under Cumulative conditions, the Project would generate approximately 14.0 HBW VMT per employee, which is greater than the per-employee significance threshold of 12.1 HBW VMT (based on a VMT rate 16.8 percent below the regional average of 14.6 HBW VMT per employee). Therefore, the Project would be a cumulatively considerable contributor to a significant cumulative impact on VMT under Cumulative Plus Project conditions. A comparison between the Bay Area region and East of 101 per-employee VMT averages under Existing and Cumulative conditions are presented in **Table 4.1**.

Table 4.1 VMT Impact Determination

Location	Total HBW VMT *(a)*	Total Employees *(b)*	HBW VMT per Employee *(a) / (b)*	VMT per Employee Threshold	VMT Impact Determination
East of 101 Area, Existing	581,977	35,831	16.2	11.8	Yes
East of 101 Area, 2040 Cumulative	1,975,199	736,810	14.0	12.1	Yes

Source: Fehr & Peers 2020; C/CAG-VTA Bi-County Transportation Demand Model, 2019.

Mitigation Measures:

First- and last-mile transit connections and active transportation improvements are likely to yield the greatest Project VMT reductions. The following mitigation measures support and enhance the effectiveness of the Project's TDM strategies, which as noted in Section 3.3 are unlikely to substantially reduce HBW VMT per-employee but will aid in reducing Project auto travel demand. Mitigation Measure TRANS-1 is appropriate under both Existing Plus Project and Cumulative Plus Project conditions. Components of Mitigation Measure TRANS-1 are shown in **Figure 4-1**.

TRANS-1 The applicant shall provide funding toward the City's design and construction of the following off-site improvements to support the Project's first- and last-mile strategies necessary to support auto trip reduction measures.

- The Project shall provide a fair-share contribution towards the City's cost of facilities and improvements identified below for the purposes of upgrading Poletti Way sidewalk to a Class I shared-use bicycle and pedestrian pathway between the Caltrain Station at East Grand Avenue, and the street's northern terminus as identified in the *Active South City: Bicycle and Pedestrian Master Plan* (currently in draft form), or if said Master Plan is in the process of being amended or updated at the time of the first building permit for the Project, then the Project shall instead provide a fair-share contribution in an equivalent amount towards improvements and upgrades of equivalent design and purpose, as determined by the City's Chief Planner in his reasonable discretion. The Gateway Property Owners Association is currently in the process of dedicating the Poletti Way right-of-way to the City and the dedication is expected to be completed by the end of 2020. The improvement will include curb ramps, curb and gutter, signage, markings, and other changes necessary to meet Caltrans and City of South San Francisco Class I bikeway standards. Specific improvements will include upgrades at vehicular crossings (such as driveways and minor streets) to provide 10-foot minimum wide barrier-free accessible ramps that permit direct, two-way bicycle and pedestrian travel. Adequate warning and regulatory signage and markings will be provided to alert road users of potential conflicts per the *California Manual on Uniform Traffic Control Devices* (CAMUTCD). Existing pavement conditions will be assessed and reconstructed if necessary, per City of South San Francisco standards. The Project's obligation to pay a fair share contribution toward this improvement is contingent upon the City (i) adopting a final *Active South City Bicycle and Pedestrian Master Plan* that includes the improvement, or City approval of a plan for improvements of equivalent design and purpose; (ii) acquiring any necessary right of way; and (iii) implementing a program that will require fair share contributions from other developments in the East of 101 area that will benefit from the improvement.
- The Project shall provide a fair share contribution toward the City's cost of facilities and improvements identified below for the purposes of extending Class II bicycle lanes on Gateway Boulevard between East Grand Avenue and Oyster Point Boulevard, assuming 1,100 linear feet of frontage. This improvement will include striping new bicycle lanes and restriping existing lanes. Extending bicycle lanes will support enhanced bicycle access from south of the project site as identified in the *Active South City: Bicycle and Pedestrian Master Plan* (currently in draft form). If said Master Plan is in the process of being amended or updated at the time of the first building permit for the Project, then the Project shall

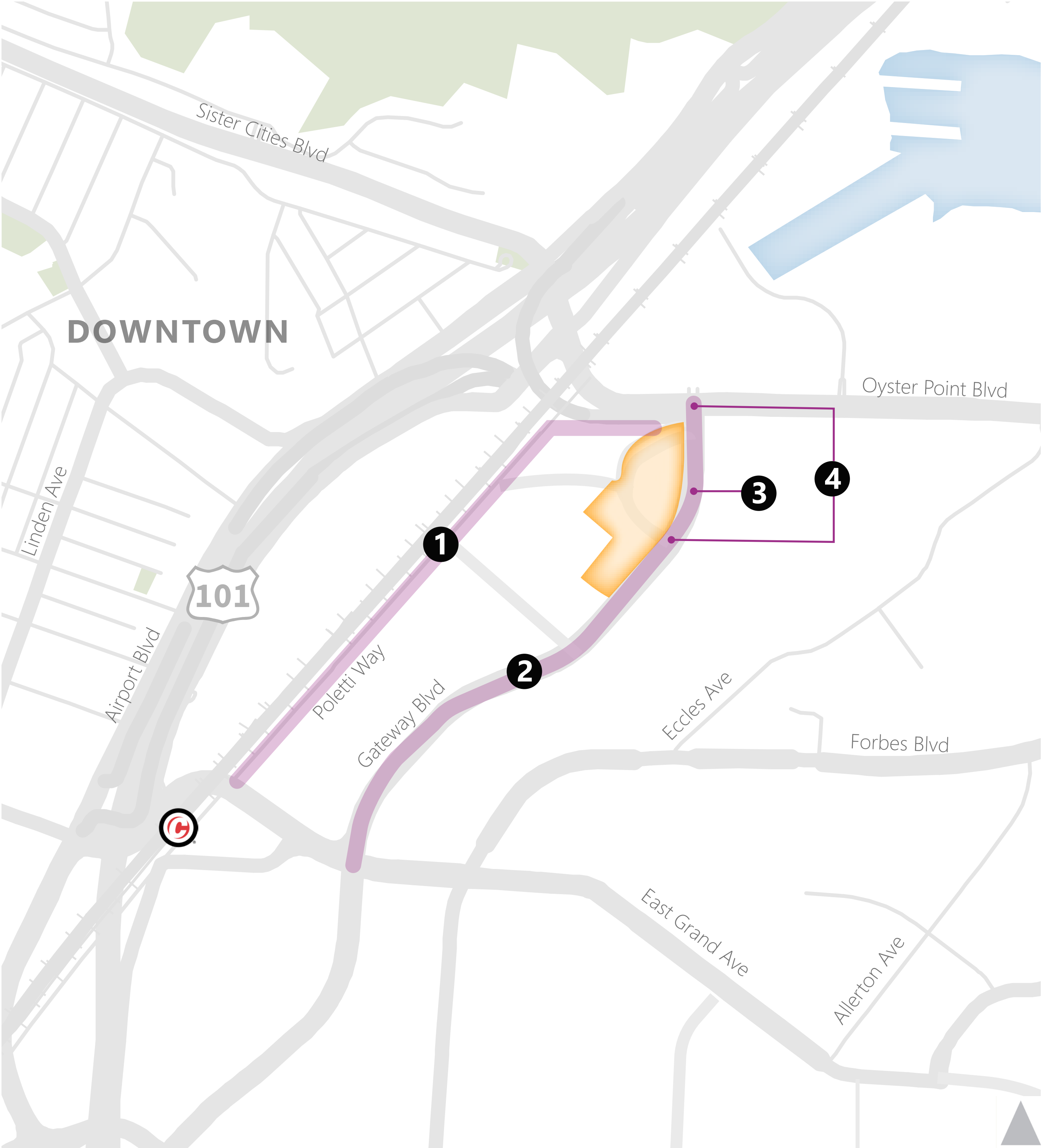
instead provide a fair-share contribution in an equivalent amount towards improvements and upgrades of equivalent design and purpose, as determined by the City's Chief Planner in his reasonable discretion.

- The Project shall participate in first-/last-mile shuttle program(s) to Caltrain, BART, and the ferry terminal. Shuttles may be operated by Commute.org and/or a future East of 101 transportation management agency. The Project may provide an on-site loading zone for potential future private shuttles or pick-up/drop-off operations; however public shuttle shall utilize on-street shuttle stops located adjacent to the project site in order to minimize additional travel time for shuttles.[6] Southbound shuttles on Gateway Boulevard shall use the existing shuttle stop at the intersection of Gateway Boulevard and the Gateway Business Park driveway (approximately 500 feet south of the project site) or the Project may construct a new southbound shuttle stop along the project frontage on Gateway Boulevard. A new shuttle stop shall accommodate small shuttles and larger buses and shall be designed in close coordination with the City and the shuttle operators taking into consideration planned roadway improvements, other new developments, and rider needs. Northbound shuttles on Gateway Boulevard shall use the future shuttle stop at the Gateway Business Park driveway (directly across the street from the project site) as proposed as part of the Gateway of Pacific project.
- The Project shall provide a more direct connection to on-street shuttle stops by adding directional curb ramps and high visibility crosswalks at the northern leg of the Gateway Boulevard/Gateway Business Park driveway/Project driveway intersection. Since no crosswalk currently existing across the northern leg of this intersection, the Project shall review existing intersection signal timing and adjust if necessary, to accommodate the new pedestrian phase. Add high-visibility crosswalks on the south side of the Oyster Point Boulevard / Gateway Boulevard intersection (southern and eastern legs of the intersection) to improve access to shuttle stops on Oyster Point Boulevard.

For those off-site improvements where a fair-share contribution is identified, the City will collect payment from the Project and will allocate those funds for the specific improvements identified prior to issuing the first building permit. Specific details of the fair-share contributions will be addressed in the Project's conditions of approval, but in any case will comply with the Mitigation Fee Act. Specific right of way needs for Mitigation Measure TRANS-1 are described as part of each off-site improvement's description above, if applicable. No secondary impacts are expected.

Significance after Mitigation: Implementation of Mitigation Measure TRANS-1 includes many off-site improvements that support and enable the first- and last-mile non-auto commute strategies. However, this mitigation measure includes some improvements that are not fully funded, and thus uncertain in their implementation timeline with regards to the Project's construction timeline. Additionally, the mitigation measure's effectiveness is unknown and is unlikely to reduce the Project's HBW VMT below the existing and cumulative thresholds, as shown in **Table 4.1**) to reach a less-than-significant level. Therefore, this impact would be significant and unavoidable.

[6] "New shuttle stop locations on Gateway Boulevard and Oyster Point Boulevard should be designed to be consistent with the vocabulary of the existing stop at Gateway Boulevard subject to approval by The Gateway Association." Ken Kay Associates. *Gateway Business Park Master Plan*. May 2013.



Project Site

Improvement Areas

Caltrain Station

1. Pay fair-share contribution toward upgrading Poletti Way path to Class I shared path standards, including trail crossing treatments and connections to Project building entries and bicycle parking facilities.
2. Pay fair-share contribution toward extending Class II bicycle lanes on Gateway Boulevard between East Grand Avenue and Oyster Point Boulevard
3. Participate in TMA or Commute.org shuttle program. Construct new southbound on-street shuttle stop, if desired by Project sponsor.
4. Provide high visibility crosswalks and directional curb ramps at the Oyster Point Boulevard / Gateway Boulevard and Gateway Boulevard / Gateway Business Park intersections

Figure 4-1

Project Mitigation Measures

4.1.2 Freeway Ramp Queuing

Impact TRANS-2: **Development of the Project would not cause vehicle queues approaching a given movement downstream of Caltrans freeway facilities to exceed existing storage space for that movement or add vehicle trips to existing freeway off-ramp vehicle queues that exceed storage capacity resulting in a potentially hazardous condition under Existing Plus Project and Cumulative Plus Project conditions. (*Less than Significant*)**

As documented in Section 3.5, Project vehicle trips that could interfere with the freeway mainline are concentrated at the US-101 Southbound off-ramp at Oyster Point Boulevard and the US-101 Northbound off-ramps at East Grand Avenue and Dubuque Avenue, but Project trips would not exceed ramp storage capacities and interfere with the freeway mainline. Therefore, the Project would have a less-than-significant impact on freeway ramp queuing under Existing Plus Project conditions and would not be a cumulatively considerable contributor to significant cumulative impacts under Cumulative Plus Project conditions.

Mitigation Measures: None required

4.2 Bicycle, Pedestrian, and Transit

Impact TRANS-3: **Development of the Project would not produce a detrimental impact to existing bicycle or pedestrian facilities, or conflict with adopted plans and programs under Existing Plus Project and Cumulative Plus Project conditions. (*Less than Significant*)**

The Project would not produce a detrimental impact to existing bicycle or pedestrian facilities or conflict with adopted policies in adopted city plans summarized in Appendix B, Relevant Policies and Plans. Therefore, the Project's impacts to walking and biking are less-than-significant under Existing Plus Project conditions and the Project would not be a cumulatively considerable contributor to significant cumulative impacts under Cumulative Plus Project conditions.

Mitigation Measures: None required

Impact TRANS-4: **Project development or Project traffic may produce a detrimental impact to local transit or shuttle service under Existing Plus Project and Cumulative Plus Project conditions. (*Less than Significant with Mitigation*)**

The Project's site plan identifies an on-site shuttle stop intended for use by private Gateway shuttles and public Commute.org shuttles. As described in Mitigation Measure TRANS-1, the Project may provide an on-site loading zone for private shuttles or pick-up/drop-off operations; however public shuttles serving the site shall use on-street shuttle stops. The on-site shuttle stop placement and access constraints has the potential to add several minutes to existing Commute.org shuttle routes:

- The current Oyster Point BART Shuttle and Oyster Point Ferry Shuttle would need to divert from its route in a one quarter mile loop, which would include two new traffic light cycles at the Oyster Point / Gateway Boulevard intersection and the Gateway Boulevard / Gateway Business Park driveway entrance. The Oyster Point / Gateway Boulevard intersection experiences congested traffic conditions, operating at LOS F in the existing AM peak hour and LOS F in the cumulative AM and PM peak hours, suggesting these shuttles may experience substantial delays. New routing and/or additional route creation for both routes are likely as public and private services consolidate to improve overall frequency and other efficiencies. New signal timing, new turn lanes and other street improvements planned may also improve conditions.
- The current Oyster Point Caltrain Shuttle would require an extensive route diversion for northbound shuttles since no access is provided via Gateway Boulevard, forcing shuttles to navigate through parking lots accessed via Poletti Way in order to access the shuttle stop. This diversion would be approximately ½ mile via slow speed parking aisles, suggesting this shuttle may also experience noticeably longer run times. Again, the potential new routing, new stop locations, and new routes are likely to minimize these additional delays.

Commute.org's existing shuttle routes already include numerous route diversions, the sum of these diversions results in longer travel times and wait times, which ultimately discourages transit ridership. Adding new such diversions should be avoided. The Project's site plan therefore may pose a significant impact to public shuttle operations. The Project should coordinate closely with shuttle operators. It should be noted that enhanced shuttle routes and stops could potentially look quite different than the existing commute.org network with the consolidation of private and public services.

Mitigation Measures: The applicant shall implement mitigation measure **TRANS-1** in order to improve pedestrian connections with existing and/or new public shuttle stops. Mitigation Measure TRANS-1 is appropriate under both Existing Plus Project and Cumulative Plus Project conditions.

Significance after mitigation: Implementation of Mitigation Measure TRANS-1 would enable the project to limit travel time effects on existing shuttle routes by eliminating additional route diversions. This Mitigation Measure would reduce Project transit impact impacts to less-than-significant under Existing Plus Project conditions and less than cumulatively considerable under Cumulative Plus Project conditions.

4.3 Hazards

Impact TRANS-5: **Development of the Project would not substantially increase hazards due to a geometric design feature or incompatible uses under Existing Plus Project and Cumulative Plus Project conditions. (*Less than Significant*)**

The Project design does not create any new or worsen any existing geometric design features that cause hazards. The Project provides two driveways off Gateway Boulevard (one is right-in right-out only, while the other is signalized and full access) but does not change the geometry of any of the adjacent roadways. Sight distance at the proposed driveways is not expected to change from what is available under existing conditions and is expected to be adequate for drivers exiting the project site and for pedestrians crossing the driveways. Any future vegetation located within the sight triangles at driveways should be maintained so as not to restrict drivers sight distance when exiting the driveways. The Project does not include any uses that are incompatible with the surrounding land use or the existing roadway system. Therefore, the Project is expected not to result in a substantial increase to hazards, and the Project's impacts to hazards are less-than-significant under Existing Plus Project conditions and less than cumulatively considerable under Cumulative Plus Project conditions.

Mitigation Measures: None required

4.4 Emergency Access

Impact TRANS-6: **Development of the Project would not result in inadequate emergency access under Existing Plus Project and Cumulative Plus Project conditions. (*Less than Significant*)**

Vehicle trips generated by the Project would represent a very small percentage of overall daily and peak hour traffic on roadways and freeways in the study area. The Project generates 206 AM peak hour and 172 PM peak hour net new vehicle trips which are distributed to study intersections. Project-added vehicle trips represent approximately three percent of entering volumes at study intersections during the peak hours. The Project does not include features that would alter emergency vehicle access routes or roadway facilities; fire and police vehicles would continue to have access to all facilities around the entire city. Upon construction, emergency vehicles would have full access to the project site. Therefore, the Project is expected not to result in inadequate emergency access, and the Project's impacts to emergency access are less-than-significant under Existing Plus Project conditions and less than cumulatively considerable under Cumulative Plus Project conditions.

Mitigation Measures: None required

Appendix A: VMT Technical Context

Senate Bill 743 (Stats. 2013, ch. 386) (SB 743) is intended to better align CEQA transportation impact analysis practices and mitigation outcomes with the State's goals to reduce greenhouse gas (GHG) emissions, encourage infill development, and improve public health through more active transportation. The law creates several key statewide changes to the California Environmental Quality Act (CEQA).

First, the law requires the Governor's Office of Planning and Research (OPR) to establish new metrics for determining the significance of transportation impacts of projects within transit priority areas (TPAs) and allows OPR to extend use of the metrics beyond TPAs. OPR selected vehicle miles of travel (VMT) as the preferred transportation impact metric and applied their discretion to require its use statewide.

Second, this legislation establishes that aesthetic and parking impacts of a residential, mixed-use residential, or employment center projects on an infill site within a TPA shall not be considered significant impacts on the environment.

Third, the new CEQA Guidelines that implement this legislation state that generally, vehicle miles traveled is the most appropriate measure of transportation impacts, and that as of July 1, 2020, this requirement shall apply statewide, but that until that date, lead agencies may elect to rely on VMT rather than LOS to analyze transportation impacts.

Finally, the law establishes a new CEQA exemption for a residential, mixed-use, and employment center project a) within a transit priority area, b) consistent with a specific plan for which an EIR has been certified, and c) consistent with a Sustainable Communities Strategy (SCS). This exemption requires further review if the project or circumstances changes significantly.

To aid in SB 743 implementation, the following state guidance has been produced:

- *Technical Advisory on Evaluating Transportation Impacts in CEQA,* California Governor's Office of Planning and Research, December 2018[1]
- *California Air Resources Board* (CARB) *2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals*, California Air Resources Board, January 2019[2]
- *Local Development – Intergovernmental Review Program Interim Guidance, Implementing Caltrans Strategic Management Plan 2015-2020 Consistent with SB 743*, Caltrans, November 9, 2016[3]

The California Air Resources Board 2017 *Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals* provides recommendations for VMT reduction thresholds that would be necessary to achieve the State's GHG reduction goals. CARB finds per-capita light-duty vehicle travel would need to be

[1] http://opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf
[2] https://ww2.arb.ca.gov/sites/default/files/2019-01/2017_sp_vmt_reductions_jan19.pdf
[3] https://dot.ca.gov/programs/transportation-planning/office-of-smart-mobility-climate-change/sb-743

approximately 16.8 percent lower than existing by 2050, and overall per-capita vehicle travel would need to be approximately 14.3 percent lower than existing levels by 2050 under that scenario. CARB also acknowledges that the SCS targets are not sufficient to meet climate goals. As stated in the report, "…the full reduction needed to meet our climate goals is an approximately 25 percent reduction in statewide per capita on-road light-duty transportation-related GHG emissions by 2035 relative to 2005."

OPR considered this research when developing recommended VMT thresholds. In the *Technical Advisory on Evaluating Transportation Impacts in CEQA* (December 2018), OPR recommends that a per capita or per employee VMT that is 15 percent below that of existing development may be a reasonable threshold. This threshold is based on the above-mentioned research documents from CARB as well as evidence that suggests a 15 percent reduction in VMT is achievable at the project level in a variety of place types[4] and would help the State towards achieving its climate goals. However, each jurisdiction must apply the statewide VMT analysis guidance based on available travel data and tools.

Application of Statewide Guidance for Project Analysis

Home-based work VMT (HBW VMT) per employee was identified as the appropriate Project analysis metric. This metric follows OPR guidance for measuring office project VMT and helps compare the Project's relative transportation efficiency to the regional average. OPR recommends using a regional geography for office projects. Neither the local city or county level geographic area is robust enough to capture the full length of most trips or evaluate the interaction of the Project in a regional setting. Accordingly, the nine-county Bay Area region was selected as the geographic boundary for the assessment. The nine-county Bay Area region will capture the full length of work trips and would be most consistent with OPR's guidance.

For office projects, OPR recommends using a tour-based VMT accounting method which is based on a chain of trips including multiple stops. The Metropolitan Transportation Commission (MTC) model is the sole tour-based travel demand model available for South San Francisco. However, the MTC model lacks the level of roadway network and land use detail that is necessary for this assessment. Instead, existing per capita VMT data, expressed as HBW VMT per employee, was extracted from similar existing land uses in the East of 101 area as a proxy for the Project to reasonably assess the Project VMT. The C/CAG bi-county travel demand model was used to obtain employee population data and total HBW VMT from the appropriate East of 101 transportation analysis zone (TAZ). Updates were made to the C/CAG Model to calibrate existing population and employment data in South San Francisco, consistent with the *Shape SSF* General Plan analysis.

---

[4] CAPCOA (2010) Quantifying Greenhouse Gas Mitigation Measures, p. 55, available at http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf

Appendix B: Relevant Plans & Policies

Agencies with Jurisdiction over Transportation in South San Francisco

The City of South San Francisco has jurisdiction over all local City streets and City-operated traffic signals within the study area. Several regional agencies, including the City/County Association of Governments of San Mateo County (C/CAG), the Congestion Management Agency in San Mateo County, and the Metropolitan Transportation Commission (MTC), coordinate and establish funding priorities for regional transportation improvement programs. Freeways serving South San Francisco (U.S. 101, I-380, and I-280), associated local freeway ramps, and local surface highway segments (SR-82) are under the jurisdiction of the State of California Department of Transportation (Caltrans). Transit service providers such as BART, Caltrain, SamTrans, and the Water Emergency Transportation Authority (ferry service), have jurisdiction over their respective services. These agencies, their responsibilities, and funding sources are more specifically described below.

City of South San Francisco

The City of South San Francisco is responsible for planning, constructing, and maintaining local public-serving transportation facilities, including all City streets, City-operated traffic signals, sidewalks, and bicycle facilities. These local services are funded primarily by gas-tax revenue and land development Impact Fees.

San Mateo City/County Association of Governments (C/CAG)

C/CAG is the Congestion Management Agency (CMA) for San Mateo County authorized to set State and federal funding priorities for improvements affecting the San Mateo County Congestion Management Program (CMP) roadway system. The C/CAG-designated CMP roadway system in South San Francisco include SR 82 (El Camino Real), U.S. 101, I-380, and I-280. C/CAG has set the level of service standards for U.S. 101 segments in the vicinity of the Project site.

C/CAG has adopted guidelines to reduce the number of net new vehicle trips generated by new land development. These guidelines apply to all developments that generate 100 or more net new peak-hour vehicular trips on the CMP network and are subject to CEQA review. The goal of the guidelines is that the developer and/or tenants will reduce the demand for all new peak hour trips (including the first 100 trips) projected to be generated by the development.

Peninsula Traffic Congestion Relief Alliance (Commute.org)

The Alliance is a joint powers authority dedicated to implementing transportation demand management programs in San Mateo County and providing alternatives to single-occupant auto travel, including both commuter and community shuttles. A Board of Directors consisting of elected officials from each of its 17-

member cities and one representative from the County Board of Supervisors governs the Alliance. The Alliance manages 26 shuttle routes in San Mateo County. In South San Francisco, the Alliance runs seven first- and last-mile weekday peak hour and direction commuter routes that connect the South San Francisco Caltrain and BART stations, and the South San Francisco Bay Ferry (WETA) terminal with the East of 101 employment area.

California Department of Transportation (Caltrans)

Caltrans has authority over the State highway system, including mainline facilities, interchanges, and arterial State routes. Caltrans approves the planning and design of improvements for all State-controlled facilities. Caltrans facilities in South San Francisco include US-101 and its interchanges, I-280 and its interchanges, I-380 and its interchanges, and SR 82 (El Camino Real).

SamTrans

The San Mateo County Transit District (SamTrans) is the primary public transportation provider in San Mateo County. SamTrans manages local and regional bus service, paratransit services, and Caltrain commuter rail. There are over 50 routes in the county that can be categorized as community, express, BART connection, Caltrain connection, and BART and Caltrain connection routes. SamTrans buses do not serve the Project site nor the East of 101 employment area.

Caltrain

Caltrain operates 50 miles of commuter rail between San Francisco and San Jose, and limited service trains to Morgan Hill and Gilroy during weekday commute periods and directions. Caltrain is governed through the Peninsula Corridor Joint Powers Board and managed by SamTrans. On weekdays, Caltrain operates approximately 100 trains per day of local, limited stop, and Baby Bullet express service in both directions. The South San Francisco station is currently served by two limited-stop trains per hour during peak weekday commute periods and directions.

Water Emergency Transit Agency (WETA)

The San Francisco Bay Area Water Emergency Transportation Authority (WETA) operates the San Francisco Bay Ferry, a regional ferry service on the San Francisco Bay and coordinates water transit response to regional emergencies. WETA provides public ferry service to the cities of Alameda, Oakland, San Francisco, South San Francisco, and Vallejo.

Relevant Plans and Policies

State of California Senate Bill 743

Discussed in Appendix A.

City of South San Francisco General Plan Transportation Chapter

The City of South San Francisco General Plan (1999) defines transportation and land use policies for the City. The General Plan establishes transportation policies pertinent to the Project, including:

- *4.2-G-1: Undertake efforts to enhance transportation capacity, especially in growth and emerging employment areas such as in the East of 101 area.*
- *4.2-G-10 Make efficient use of existing transportation facilities and, through the arrangement of land uses, improved alternate modes, and enhanced integration of various transportation systems serving South San Francisco, strive to reduce the total vehicle-miles traveled.*
- *4.2-1-10: Design roadway improvements and evaluate development proposals based on LOS standards.*
- *4.3-I-16 Favor Transportation Systems Management programs that limit vehicle use over those that extend the commute hour.*

The City of South San Francisco's General Plan is currently being updated through the *Shape SSF General Plan 2040* public engagement process and is targeted for adoption in late 2021. Since the update is underway, this document refers to policies and programs from the approved 1999 general plan and relevant adopted amendments.

South San Francisco East of 101 Mobility 20/20 Plan

The City of South San Francisco Mobility 20/20 Plan (2019) analyzed existing and future land use in the East of 101 Area, with the goal of providing a framework for multimodal improvements to the area's transportation network. Its findings and recommendations will be incorporated into *Shape SSF*, the City's 2040 General Plan Update. The plan envisions reducing vehicle miles traveled and drive-alone mode share while expanding throughput capacity along major corridors serving the area's core employment areas.

Key identified project opportunities include US-101 interchange improvements and secondary north-south arterial connections to Brisbane's Sierra Point to the north and the San Francisco International Airport area to the south via a new causeway spanning San Bruno Channel. The bicycle and pedestrian network would be substantially upgraded with separated bikeways, expanded sidewalks, and new pedestrian crosswalks. Transit enhancements include transit-only lanes along the Oyster Point Boulevard corridor complimented by new or upgraded direct service connections between job centers and regional transit stations.

South San Francisco Complete Streets Policy

The City of South San Francisco adopted its Complete Streets Policy (2012) to serve all street users:

- *Resolution 86-2012: Create and maintain complete streets that provide safe, comfortable, and convenient travel along and across streets including streets, roads, highways, bridges, and other portions of the transportation system through a comprehensive, integrated transportation network that serves all categories of users, including pedestrians, bicyclists, persons with disabilities, motorists,* *movers of commercial goods, users and operators of public transportation, seniors, children, youth, and families.*

-
- The Complete Streets Policy was incorporated into the amended General Plan and includes the following policy related to the Project:
-
- *4.2-I-11: In all street projects include infrastructure that improves transportation options for pedestrians, bicyclists, and users of public transportation of all ages and abilities. Incorporate this infrastructure into all construction, reconstruction, retrofit, maintenance, alteration, and repair of streets, bridges, and other portions of the transportation network.*

South San Francisco Bicycle Master Plan

The City of South San Francisco Bicycle Master Plan (2011) identifies and prioritizes street improvements to enhance bicycle access. The plan analyzes bicycle demand and gaps in bicycle facilities and recommends improvements and programs for implementation. The Bicycle Master Plan establishes the following policy related to the Project:

- *3.2-1: All development projects shall be required to conform to the Bicycle Transportation Plan goals, policies and implementation measures.*

South San Francisco Pedestrian Master Plan

The City of South San Francisco Pedestrian Master Plan (2012) identifies and prioritizes street improvements to enhance pedestrian access. The plan analyzes pedestrian demand and gaps in pedestrian facilities and recommends improvements and programs for implementation. The Pedestrian Master Plan establishes the following policy related to the Project:

- *Policy 3.2: Pedestrian facilities and amenities should be provided at schools, parks, and transit stops, and shall be required to be provided at private developments, including places of work, commercial shopping establishments, parks, community facilities and other pedestrian destinations.*

South San Francisco Transportation Demand Management Ordinance

The City of South San Francisco TDM Ordinance (Ord. 1432 § 2, 2010) seeks to reduce the amount of traffic generated by nonresidential development and minimize drive-alone commute trips. The ordinance establishes a performance target of 28 percent minimum alternative mode share for all nonresidential projects resulting in more than 100 average daily trips and identifies a higher threshold for projects requesting a floor area ratio (FAR) bonus.

All projects are required to submit annual mode share surveys and FAR bonus project sponsors are required to submit triennial reports assessing project compliance with the required alternative mode share target. Where targets are not achieved, the report must include program modification recommendations and City officials may impose administrative penalties should subsequent triennial reports indicate mode share targets remain unachieved. As documented in Section 1, Project Description, while SSFMC Section 20.400 does not call out a specific alternate mode-share (AMS) requirement for the Gateway Specific Plan District, similar zoning districts, and General Plan requirements in the East of 101 area require an AMS of 35 – 40 percent for development of a Floor Area Ratio of 1.0 – 1.25, and this standard would be applied to the 751 Gateway project, consistent with the City's requirements and policies to increase AMS and decrease single occupancy vehicle traffic.

C/CAG Congestion Management Program Guidelines

C/CAG has adopted guidelines as a part of its Congestion Management Program (CMP), which are intended to reduce the regional traffic impacts of substantive new developments. The guidelines apply to all projects in San Mateo County that will generate 100 or more net new peak-hour trips on the CMP network and are subject to CEQA review. C/CAG calls for projects that meet the criteria to determine if a combination of acceptable measures is possible that has the capacity to "fully reduce," through the use of a trip credit system, the demand for net new trips that the project is anticipated to generate on the CMP roadway network (including the first 100 trips). C/CAG has published a list of mitigation options in a memorandum. South San Francisco's TDM ordinance is consistent with CCAG's ordinance, so be adhering to the City's ordinance, the Project would also be compliant with CCAG's guidelines.

Caltrain Business Plan

Caltrain is developing a Business Plan to provide guidance for the rail corridor's growth through year 2040. The Caltrain Business Plan includes both policy and technical recommendations and will help define how Caltrain service should grow and evolve in the near-term and long-term to best serve existing and future passengers. The Peninsula Corridor Joint Powers Board, Caltrain's board of directors, adopted a 2040 service plan vision in October 2019 that calls for increasing peak commute service to a minimum of eight trains per direction per hour and increased off-peak and weekend service.

Appendix C:
Traffic Operations Analysis

This traffic operations analysis studies the vehicle congestion effects of the Project at signalized and unsignalized intersections using level of service (LOS). LOS is a quantitative description of an intersection's performance based on the average delay per vehicle. Intersection levels of service range from LOS A, which indicates free flow or excellent vehicle flow conditions with short delays, to LOS F, which indicates congested or overloaded vehicle flow conditions with extremely long delays. The City of South San Francisco General Plan establishes LOS A through LOS D as acceptable operations, while LOS E and LOS F are considered unsatisfactory unless there is no mitigation feasible, except at intersections within ¼ mile of rail stations or ferry terminals where LOS does not apply. LOS for the study intersections were analyzed using the Highway Capacity Manual (HCM) 2000 and 6th Edition methodology and the Synchro traffic analysis software to maintain consistency with previous studies. Due to the relatively small Project size, detailed freeway analysis was not performed unless Project trips exceeded one percent of capacity.

While HCM methodology and Synchro traffic analysis software represent the state of the practice in evaluating isolated intersection operations, this methodology presents some limitations for both signalized and unsignalized intersections within a congested network. Under highly congested conditions, use of deterministic traffic modeling tools such as Synchro may not fully reflect the extent of vehicular queuing and spillover effects between intersections. To partially account for these conditions, saturated flow rates were manually adjusted based on field observations and traffic monitoring data. Similarly, these tools cannot anticipate how drivers may react to day-to-day variations in traffic conditions. Finally, this analysis is predicated on data collected on specific days; while existing conditions were counted on "typical" weekdays, traffic flows may vary by up to ten percent from day to day.

The analysis results are presented for information only and are not intended to inform the environmental review process. As documented in Appendix A, VMT Technical Analysis, Senate Bill 743 stipulates that vehicle LOS and similar measures related to auto delay shall not be used as the sole basis for determining the significance of transportation impacts under the California Environmental Quality Act (CEQA). However, local agencies may continue to use vehicle congestion metrics for non-CEQA transportation planning and evaluation.

Signalized Intersections

The method from Chapter 16 of the *Highway Capacity Manual* (HCM) bases signalized intersection operations on the average control delay experienced by motorists traveling through it. Control delay incorporates delay associated with deceleration, acceleration, stopping, and moving up in the queue. This method uses various intersection characteristics (such as traffic volumes, lane geometry, and signal phasing) to estimate the average control delay. **Table C.1** summarizes the relationship between average delay per vehicle and LOS for signalized intersections according to the HCM 6th Edition methodology.

Table C-1 Signalized Intersection LOS Criteria

Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Operations with very low delay occurring with favorable progression and/or short cycle length.	≤ 10
B	Operations with low delay occurring with good progression and/or short cycle lengths.	> 10 and ≤ 20
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	> 20 and ≤ 35
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable.	> 35 and ≤ 55
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	> 55 and ≤ 80
F	Operation with delays unacceptable to most drivers occurring due to over saturation poor progression, or very long cycle lengths.	> 80

Source: Transportation Research Board, 2016. Highway Capacity Manual 6th Edition

Unsignalized Intersections

Traffic conditions at the unsignalized study intersections (stop sign and yield sign-controlled intersections) were evaluated using the method from Chapter 17 of the HCM. With this method, operations are defined by the average control delay per vehicle (measured in seconds) for each stop-controlled approach that must yield the right-of-way. At four-way stop-controlled intersections, the control delay is calculated for the entire intersection and for each approach. The delays and corresponding LOS for the entire intersection are reported. At two-way stop-controlled intersections the movement with the highest delay and corresponding LOS is reported. **Table C.2** summarizes the relationship between delay and LOS for unsignalized intersections.

Table C-2 Unsignalized Intersection LOS Criteria

Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Little or no traffic delays.	≤ 10
B	Short traffic delays.	> 10 and ≤ 15
C	Average traffic delays.	> 15 and ≤ 25
D	Long traffic delays.	> 25 and ≤ 35
E	Very long traffic delays.	> 35 and ≤ 50
F	Extreme traffic delays with intersection capacity exceeded.	> 50

Source: Transportation Research Board, 2016. Highway Capacity Manual 6th Edition

Traffic Operations Policy

The City of South San Francisco's General Plan includes the following traffic operations polices relevant to the Project traffic operations analysis, including:

- *4.2-G-15 Strive to maintain LOS D or better on arterial and collector streets, at all intersections and on principal arterials in the CMP during peak hours.*
- *4.2-G-16 Accept LOS E or F after finding that: there is no practical and feasible way to mitigate the lower level of service; and, the uses resulting in the lower level of service are of clear, overall public benefit.*
- *4.2-G-17 Exempt development within one-quarter mile of a Caltrain or BART station, or a City-designated ferry terminal, from LOS standards.*

Analysis Scenarios

This analysis evaluates weekday AM peak hour traffic period between 7:00 AM and 9:00 AM and the weekday PM peak hour traffic periods between 4:00 PM and 6:00 PM. Counts were conducted during November 2019 while freeway counts were based on the Caltrans Performance Measurement System (PeMS) for the same time period. Study intersections were evaluated for the following scenarios:

- **Existing Conditions**: Existing November 2019 traffic volumes for local roadways.
- **Plus Project Conditions**: Existing traffic volumes plus new traffic from the Project.
- **Cumulative No Project Conditions**: Projected conditions in 2040 without the Project.
- **Cumulative Plus Project Conditions**: Projected conditions in 2040 with the Project.

While this analysis intends to be representative of existing conditions at the time of the Notice of Preparation, transportation conditions have continued to change while this analysis occurred. In particular, ongoing construction in the downtown area and along Oyster Point Boulevard and East Grand Avenue have temporarily disrupted traffic patterns. As some of these developments have been completed since traffic counts were taken in Novemebr 2019, peak hour traffic volumes may have changed. However, while these new developments are not fully captured in the existing conditions analysis, they are reflected in the cumulative analysis.

Study Locations

Study locations were selected for evaluation for the Project. The study area for the traffic analysis was selected based on local traffic patterns, trip assignment forecasts, input from the City of South San Francisco, and engineering judgment, to capture the transportation facilities where motorists are likely to experience impacts due to a net increase of trips associated with the Project. The study intersections are listed below and shown on **Figure 1-1** and listed below.

1. Gateway Boulevard / Gateway Business Park Driveway
2. Airport Boulevard / Grand Avenue
3. Gateway Boulevard / East Grand Avenue
4. Gateway Boulevard / Corporate Driveway
5. Dubuque Avenue / Oyster Point Boulevard
6. Gateway Boulevard / Oyster Point Boulevard
7. Airport Boulevard / Sister Cities Boulevard
8. Dubuque Avenue / US-101 Off-ramp

Existing Conditions

The existing conditions section include the existing no project and existing plus project scenarios. **Figure C-1**, Existing Traffic Volume, shows the existing lane configuration, traffic control, and weekday AM and PM peak hour traffic volume breakdown by movement at each of the eight study intersections.

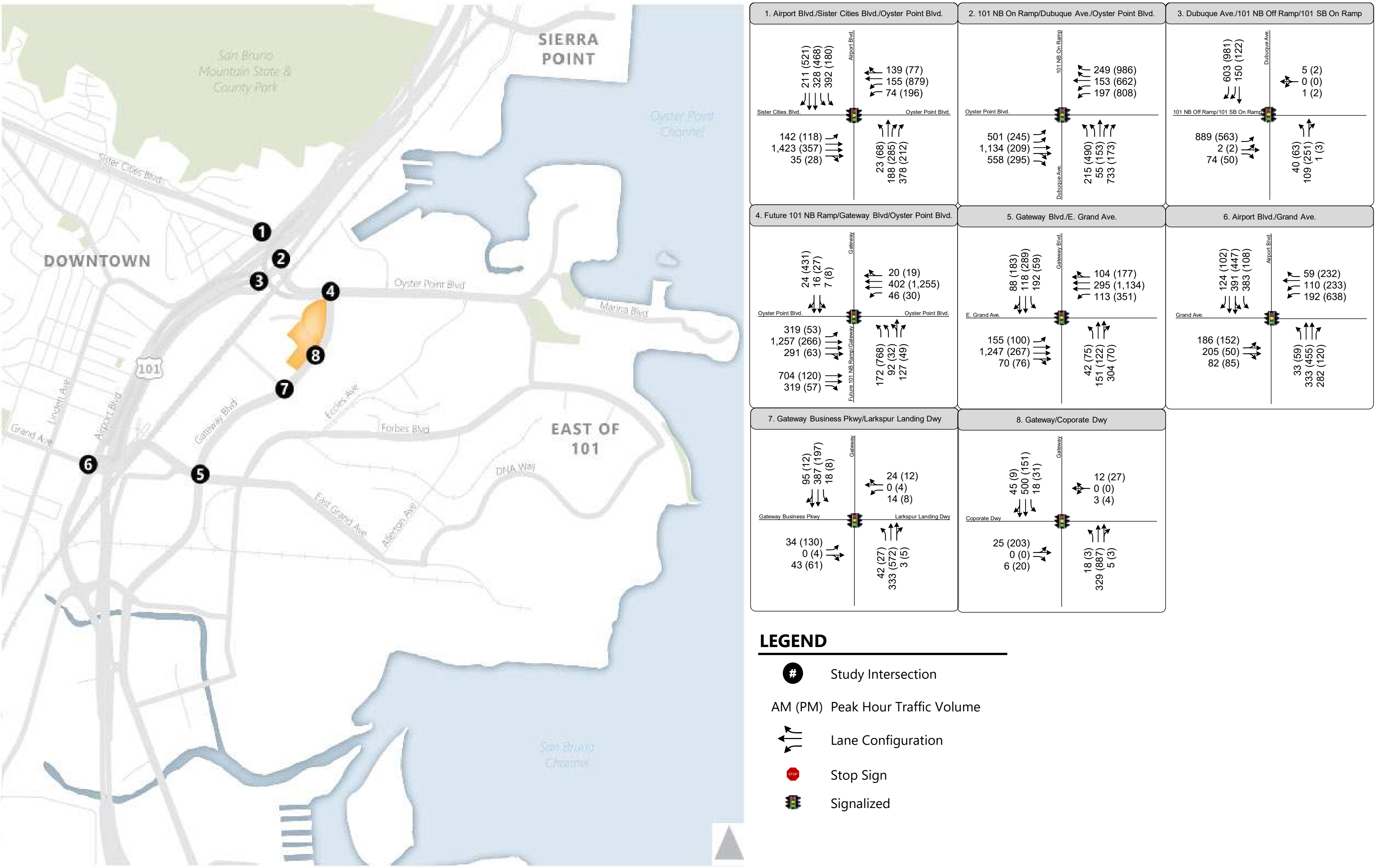


Figure C-1
Existing Traffic Volumes

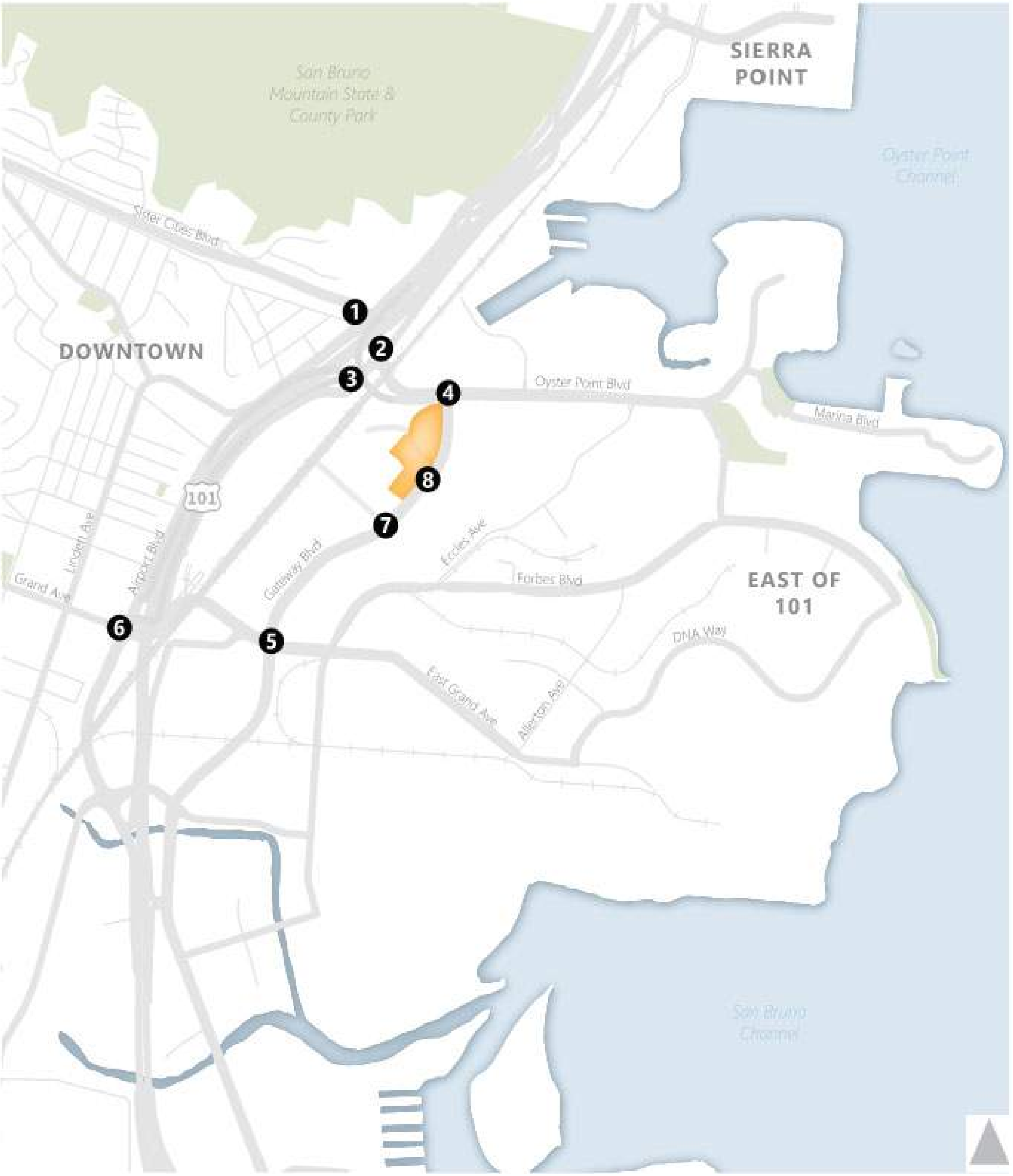
Vehicle Trip Generation, Distribution, Assignment and Level of Service

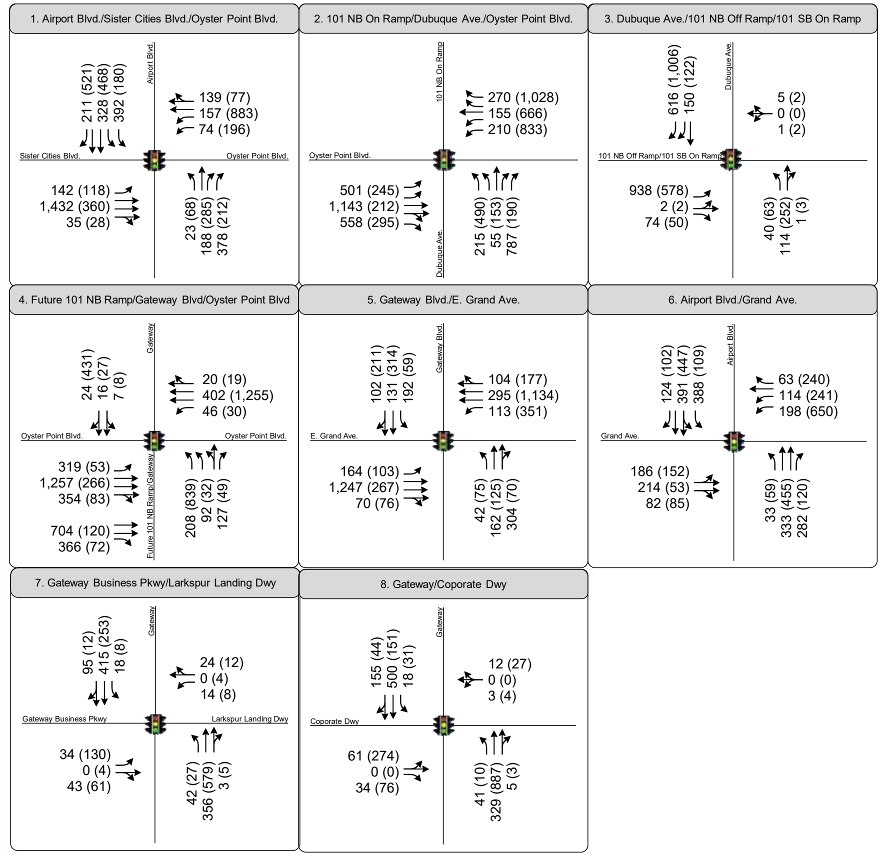
The Project trip generation and distribution estimates and methodologies are presented in Section 3, Transportation Analysis. The trip distribution assumptions, as described in Section 3.4, were used as the basis for assigning Project-generated vehicle trips to the local transportation network and eight study intersections. **Figure 3-3**, Project Trip Assignment, presents vehicle trip assignment at the eight study intersections and **Figure C-2**, Existing Plus Project Traffic Volume, shows the sum of Project trips and existing traffic volume. **Table C-3** presents level of service conditions for the study intersections.

Table C-3 Peak Hour Intersection Levels of Service: Existing Conditions Scenarios

Intersection		Traffic Control	Peak Hour	Existing Conditions		Existing Plus Project	
				Average Delay	LOS	Average Delay	LOS
1	Gateway Boulevard / Gateway Business Park Driveway	Signal	AM	<10	A	<10	A
			PM	12	B	12	B
2	Airport Boulevard / Grand Avenue	Signal	AM	36	D	36	D
			PM	45	D	45	D
3	Gateway Boulevard / East Grand Avenue	Signal	AM	48	D	49	D
			PM	45	D	45	D
4	Gateway Boulevard / Corporate Driveway	Signal	AM	<10	A	10	B
			PM	21	C	26	C
5	Dubuque Avenue / Oyster Point Boulevard	Signal	AM	25	C	26	C
			PM	34	C	35	D
6	Gateway Boulevard / Oyster Point Boulevard	Signal	AM	**>80**	**F**	**>80**	**F**
			PM	53	D	55	D
7	Airport Boulevard / Sister Cities Boulevard	Signal	AM	48	D	49	D
			PM	42	D	42	D
8	Dubuque Avenue / US-101 Off-Ramp	Signal	AM	13	B	13	B
			PM	14	B	14	B

Notes: **Bold** indicates unacceptable LOS E or F. Delay reported as seconds per vehicle. LOS based on the methodology in the Highway Capacity Manual 6th Edition. Intersections 2, 6, and 8 were analyzed based on HCM 2000. Signalized intersections, the delay shown in the weighted average for all movements in seconds per vehicle. Calculations based on signal timing provided by the City of South San Francisco from November 2019.





LEGEND

- # Study Intersection
- AM (PM) Peak Hour Traffic Volume
- Lane Configuration
- Stop Sign
- Signalized

Figure C-2
Existing Plus Project Traffic Volumes

All intersections operate under LOS D or better during AM and PM peak hours in both scenarios except for intersection #6 Gateway Boulevard / Oyster Point Boulevard. Intersection #6, Gateway Boulevard / Oyster Point Boulevard operates at LOS F during the AM peak hour under existing and existing plus project conditions. Project traffic does not cause any intersection to operate at LOS E or F that was not already operating at these levels. Project trips assigned to the US-101 freeway mainline were compared to existing capacity figures and found to be less than one percent of capacity along all northbound and southbound freeway segments in the vicinity of the Project. Accordingly, a detailed freeway operations analysis was not performed.

Freeway On-Ramp Queuing

Table C-4 shows estimated 95th percentile PM peak hour queue lengths for two US-101 on ramps that are anticipated to receive the largest share of Project vehicle trips: the Northbound US-101 on-ramp at Oyster Point Boulevard, the Southbound US-101 on-ramp at Oyster Point Boulevard, and the Southbound US-101 on-ramp at Produce Avenue. This analysis determines if freeway on-ramp vehicle queue lengths exceed storage capacity and interfere with local streets upstream from the ramp. The weekday PM peak hour was analyzed since the East of 101's employment uses result in imbalanced peak direction traffic flow in the outbound direction. Queue lengths exceed storage capacities at the US-101 northbound on-ramp at Oyster Point Boulevard in both the existing and existing plus project scenarios.

Table C-4 PM Peak Hour US-101 On-Ramp 95th Percentile Queues: Existing Conditions

US-101 Location	Freeway On-Ramp	Lanes	Storage Length	Existing Conditions		Existing Plus Project	
				Volume	Queue Length	Volume	Queue Length
1	Oyster Point Boulevard (Northbound)	2 + 1 HOV	500	1,384	**>500**	1,426	**>500**
2	Oyster Point Boulevard (Southbound)	2	980	1,044	228	1,069	433
3	Produce Avenue	2	1500	1,806	196	1,843	214

Notes: Bold type indicates conditions where queue length exceeds storage capacity. Storage distance and queues in feet per lane. Source: Fehr & Peers, 2020

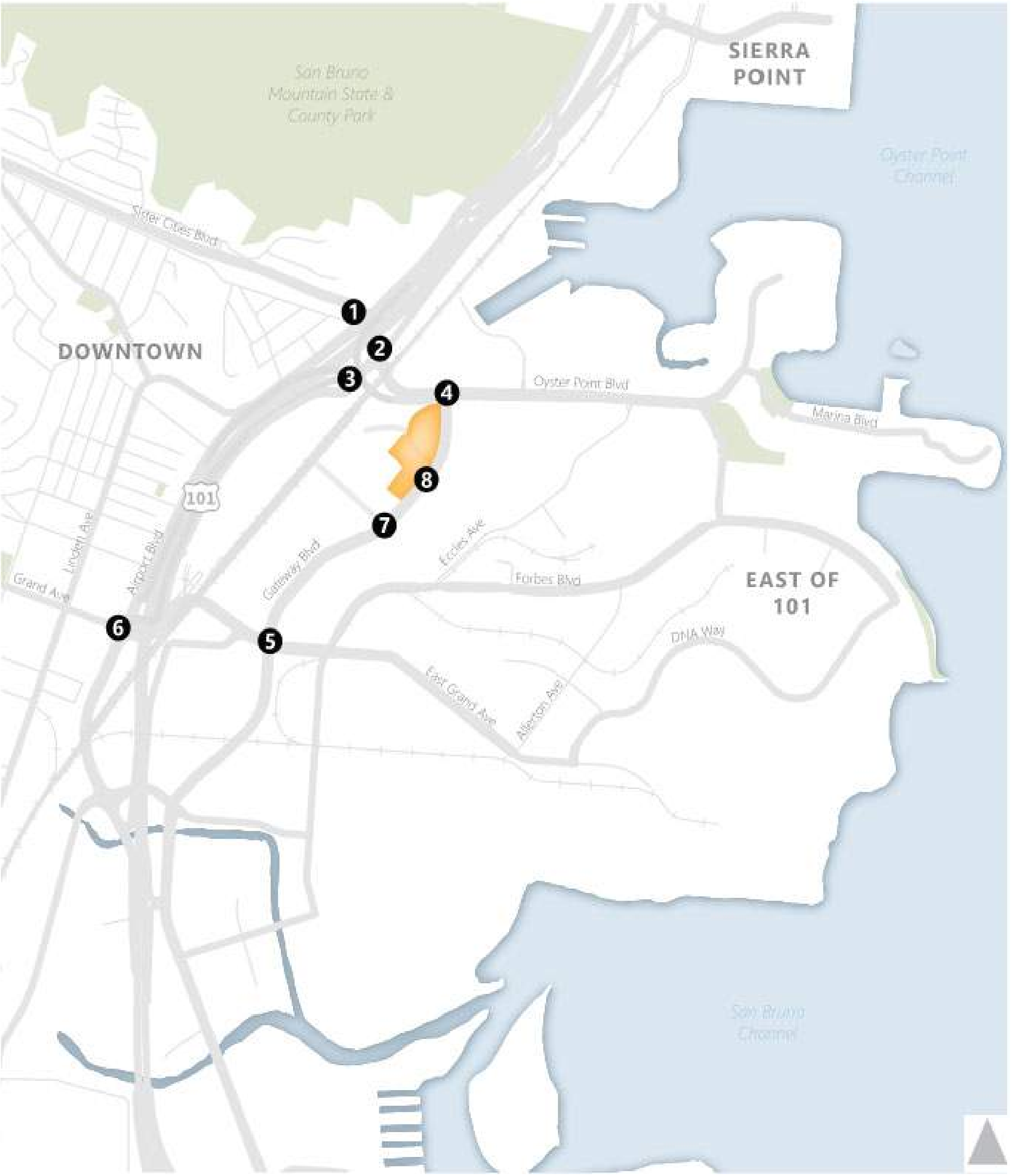
Cumulative Conditions

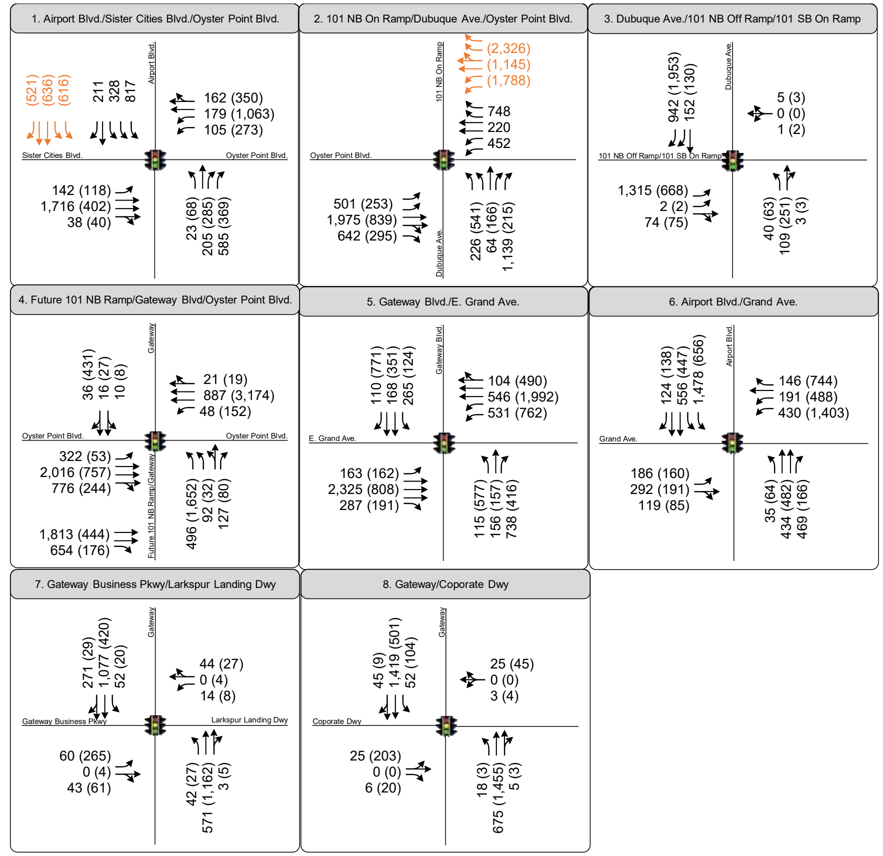
The cumulative conditions section includes the cumulative no project and cumulative plus project scenarios. **Figure C-3**, Cumulative Traffic Volume, shows cumulative no project weekday AM and PM peak hour traffic volumes that were obtained from the City of South San Francisco travel model for the year 2040. **Figure C-4**, Cumulative Plus Project Traffic Volume, shows the sum of Project trips and cumulative no project traffic volume during weekday AM and PM peak hours. **Table C-5** presents level of service at the eight study intersections.

Table C.5 Peak Hour Intersection Levels of Service: Cumulative Conditions Scenarios

Intersection		Traffic Control	Peak Hour	Cumulative Conditions		Cumulative Plus Project	
				Average Delay	LOS	Average Delay	LOS
1	Gateway Boulevard / Gateway Business Park Driveway	Signal	AM	13	B	13	B
			PM	19	B	19	B
2	Airport Boulevard / Grand Avenue	Signal	AM	**>80**	**F**	**>80**	**F**
			PM	**>80**	**F**	**>80**	**F**
3	Gateway Boulevard / East Grand Avenue	Signal	AM	**>80**	**F**	**>80**	**F**
			PM	**>80**	**F**	**>80**	**F**
4	Gateway Boulevard / Corporate Driveway	Signal	AM	<10	A	12	B
			PM	26	C	43	D
5	Dubuque Avenue / Oyster Point Boulevard	Signal	AM	**>80**	**F**	**>80**	**F**
			PM	**>80**	**F**	**>80**	**F**
6	Gateway Boulevard / Oyster Point Boulevard	Signal	AM	**>80**	**F**	**>80**	**F**
			PM	**>80**	**F**	**>80**	**F**
7	Airport Boulevard / Sister Cities Boulevard	Signal	AM	**78**	**E**	**79**	**E**
			PM	**65**	**E**	**65**	**E**
8	Dubuque Avenue / US-101 Off-Ramp	Signal	AM	13	B	13	B
			PM	20	C	20	C

Notes: **Bold** indicates LOS E or F. Delay reported as seconds per vehicle. LOS is based on the methodology in the Highway Capacity Manual 6th Edition. Intersections 2, 6, and 8 were analyzed based on HCM 2000. Signalized intersections, the delay shown in the weighted average for all movements in seconds per vehicle. Calculations based on signal timing provided by the City of South San Francisco from November 2019.





LEGEND

#	Study Intersection
AM (PM)	Peak Hour Traffic Volume
	Lane Configuration
	PM Dynamic Configuration
	Stop Sign
	Signalized

Figure C-3
Cumulative Traffic Volumes

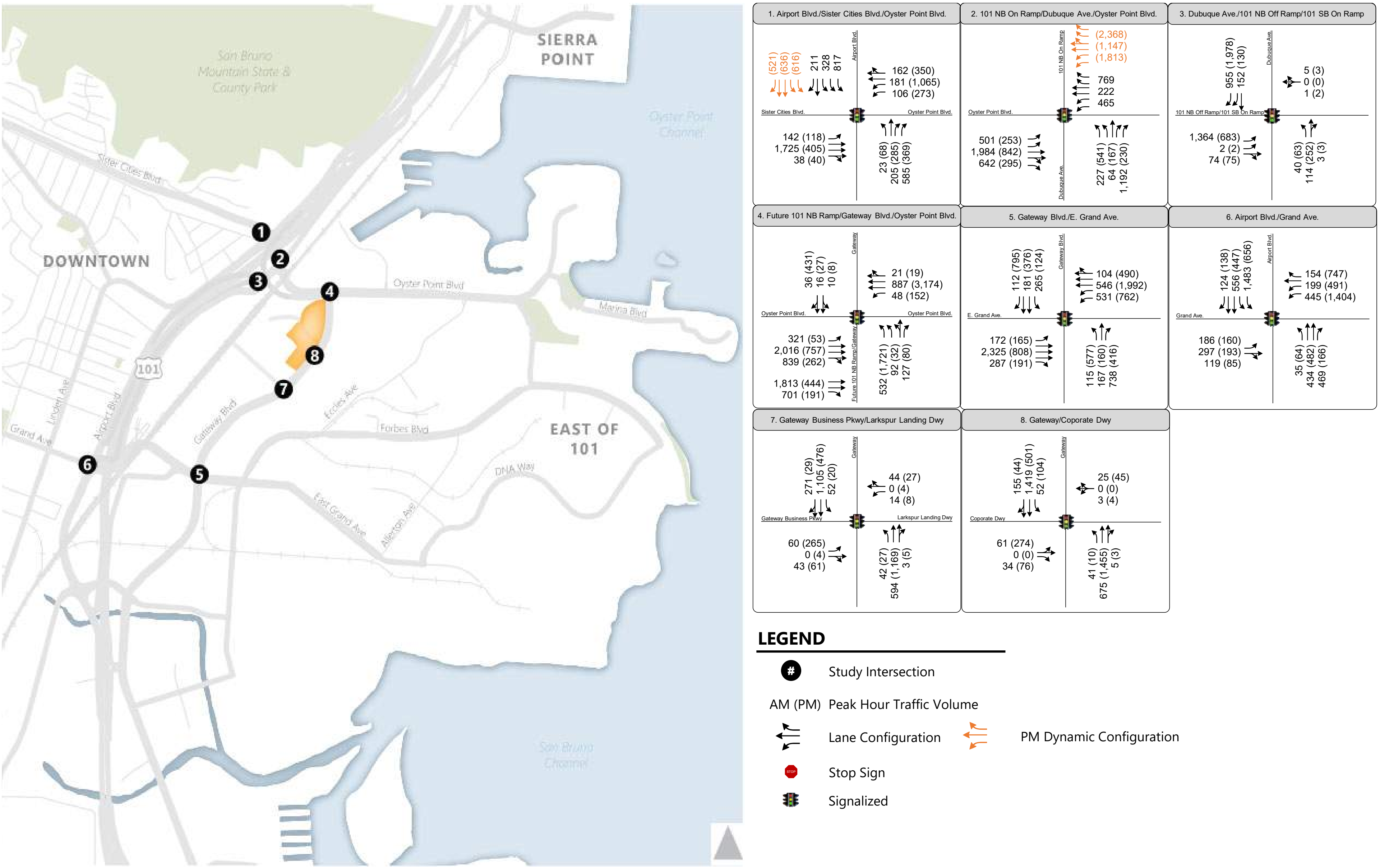


Figure C-4
Cumulative Plus Project Traffic Volumes

Freeway On-Ramp Queuing

Table C-6 shows estimated 95th percentile PM peak hour queue lengths for two US-101 on ramps that are anticipated to receive the largest share of Project vehicle trips: the Northbound US-101 on-ramp at Oyster Point Boulevard, the Southbound US-101 on-ramp at Oyster Point Boulevard, and the Southbound US-101 on-ramp at Produce Avenue. As described in the existing conditions section, the PM peak hour is the peak direction of outbound travel for the East of 101 area and is therefore the focus of the analysis. At the US-101 northbound on-ramp at Oyster Point Boulevard, queue lengths exceed storage capacity under cumulative no project and cumulative plus project scenarios.

Table C-6 PM Peak Hour US-101 On-Ramp 95th Percentile Queues: Cumulative Conditions

US-101 Northbound Freeway On-Ramp Location		Lanes	Storage Length	Cumulative Conditions		Cumulative Plus Project	
				Volume	Queue Length	Volume	Queue Length
1	Oyster Point Boulevard (Northbound)	2 + 1 HOV	500	2,745	**>500**	2,788	**>500**
2	Oyster Point Boulevard (Southbound)	2	980	2,016	949	2,041	952
3	Produce Avenue	2	1500	3,254	856	3,291	980

Notes: Bold type indicates conditions where queue length exceeds storage capacity. Storage distance and queues in feet per lane.
Source: Fehr & Peers, 2020

Appendix D: Synchro Reports

Intersection	
Intersection Delay, s/veh	12.4
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	324	114	194	76	1	57	16	135	0	2	0
Future Vol, veh/h	5	324	114	194	76	1	57	16	135	0	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles, %	4	4	4	10	10	10	16	16	16	50	50	50
Mvmt Flow	5	345	121	206	81	1	61	17	144	0	2	0
Number of Lanes	0	1	1	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	13.5	12	10.8	10.9
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	78%	0%	2%	0%	100%	0%	0%
Vol Thru, %	22%	0%	98%	0%	0%	99%	100%
Vol Right, %	0%	100%	0%	100%	0%	1%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	73	135	329	114	194	77	2
LT Vol	57	0	5	0	194	0	0
Through Vol	16	0	324	0	0	76	2
RT Vol	0	135	0	114	0	1	0
Lane Flow Rate	78	144	350	121	206	82	2
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.154	0.24	0.553	0.167	0.37	0.135	0.005
Departure Headway (Hd)	7.119	6.015	5.686	4.971	6.456	5.941	7.802
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	505	597	637	723	557	605	459
Service Time	4.853	3.748	3.412	2.697	4.186	3.67	5.849
HCM Lane V/C Ratio	0.154	0.241	0.549	0.167	0.37	0.136	0.004
HCM Control Delay	11.2	10.6	15.2	8.7	12.9	9.6	10.9
HCM Lane LOS	B	B	C	A	B	A	B
HCM 95th-tile Q	0.5	0.9	3.4	0.6	1.7	0.5	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	0	43	14	0	24	42	333	3	18	387	95
Future Volume (veh/h)	34	0	43	14	0	24	42	333	3	18	387	95
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.96		0.95	0.96		0.95	1.00		0.96	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1781	1781	1781	1796	1796	1796	1767	1767	1767
Adj Flow Rate, veh/h	35	0	5	14	0	2	43	343	3	19	399	83
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	5	8	8	8	7	7	7	9	9	9
Cap, veh/h	261	0	186	254	0	182	108	2274	20	59	1726	355
Arrive On Green	0.13	0.00	0.13	0.13	0.00	0.13	0.06	0.66	0.66	0.03	0.63	0.63
Sat Flow, veh/h	1319	0	1477	1284	0	1441	1711	3465	30	1682	2748	565
Grp Volume(v), veh/h	35	0	5	14	0	2	43	169	177	19	242	240
Grp Sat Flow(s),veh/h/ln	1319	0	1477	1284	0	1441	1711	1706	1789	1682	1678	1635
Q Serve(g_s), s	1.8	0.0	0.2	0.7	0.0	0.1	1.8	2.8	2.8	0.8	4.7	4.8
Cycle Q Clear(g_c), s	1.9	0.0	0.2	0.9	0.0	0.1	1.8	2.8	2.8	0.8	4.7	4.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.02	1.00		0.35
Lane Grp Cap(c), veh/h	261	0	186	254	0	182	108	1120	1174	59	1054	1027
V/C Ratio(X)	0.13	0.00	0.03	0.06	0.00	0.01	0.40	0.15	0.15	0.32	0.23	0.23
Avail Cap(c_a), veh/h	620	0	589	604	0	575	237	1120	1174	233	1054	1027
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.99	0.99	0.99
Uniform Delay (d), s/veh	29.5	0.0	28.7	29.1	0.0	28.7	33.8	4.9	4.9	35.3	6.1	6.1
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.0	0.0	0.0	0.9	0.3	0.3	1.2	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.1	0.2	0.0	0.0	0.8	0.9	0.9	0.3	1.5	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.6	0.0	28.8	29.2	0.0	28.7	34.6	5.2	5.2	36.5	6.6	6.6
LnGrp LOS	C	A	C	C	A	C	C	A	A	D	A	A
Approach Vol, veh/h		40			16			389			501	
Approach Delay, s/veh		29.5			29.1			8.4			7.7	
Approach LOS		C			C			A			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.6	54.3		14.1	8.7	52.2		14.1				
Change Period (Y+Rc), s	4.0	5.1		4.6	4.0	5.1		4.6				
Max Green Setting (Gmax), s	10.4	21.0		29.9	10.4	21.0		29.9				
Max Q Clear Time (g_c+I1), s	2.8	4.8		3.9	3.8	6.8		2.9				
Green Ext Time (p_c), s	0.0	1.2		0.0	0.0	1.7		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			9.3									
HCM 6th LOS			A									

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	833	54	12	413	131	639
Future Volume (veh/h)	833	54	12	413	131	639
Initial Q (Qb), veh	45	0	0	0	10	51
Ped-Bike Adj(A_pbT)		0.96	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1707	1707	1811	1811
Adj Flow Rate, veh/h	905	52	13	449	142	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	13	13	6	6
Cap, veh/h	3602	195	30	3719	214	
Arrive On Green	0.51	0.51	0.02	0.82	0.10	0.00
Sat Flow, veh/h	5014	278	1626	4815	1725	2701
Grp Volume(v), veh/h	625	332	13	449	142	0
Grp Sat Flow(s),veh/h/ln	1675	1776	1626	1554	1725	1351
Q Serve(g_s), s	10.5	10.5	0.8	2.0	8.0	0.0
Cycle Q Clear(g_c), s	10.5	10.5	0.8	2.0	8.0	0.0
Prop In Lane		0.16	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2479	1320	30	3719	214	
V/C Ratio(X)	0.25	0.25	0.44	0.12	0.66	
Avail Cap(c_a), veh/h	2542	1347	130	3808	517	
HCM Platoon Ratio	0.67	0.67	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.98	0.98	0.99	0.99	1.00	0.00
Uniform Delay (d), s/veh	10.7	10.5	48.6	2.4	42.9	0.0
Incr Delay (d2), s/veh	0.2	0.4	3.7	0.1	3.5	0.0
Initial Q Delay(d3),s/veh	1.4	1.2	0.0	0.0	46.7	0.0
%ile BackOfQ(50%),veh/ln	6.3	6.6	0.4	0.5	7.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.3	12.2	52.3	2.5	93.1	0.0
LnGrp LOS	B	B	D	A	F	
Approach Vol, veh/h	957			462	142	A
Approach Delay, s/veh	12.3			3.9	93.1	
Approach LOS	B			A	F	

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.8	79.9				85.7		14.3
Change Period (Y+Rc), s	4.0	4.0				4.0		4.0
Max Green Setting (Gmax), s	8.0	50.0				62.0		30.0
Max Q Clear Time (g_c+I1), s	2.8	12.5				4.0		10.0
Green Ext Time (p_c), s	0.0	4.5				2.2		0.5

Intersection Summary			
HCM 6th Ctrl Delay			17.2
HCM 6th LOS			B

Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	155	1247	70	113	295	104	42	151	304	192	118	88
Future Volume (veh/h)	155	1247	70	113	295	104	42	151	304	192	118	88
Initial Q (Qb), veh	5	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	969	1841	1633	1633	1633	1752	1752	1752	1767	1767	1767
Adj Flow Rate, veh/h	163	1313	71	119	311	76	44	159	0	202	124	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	18	18	18	10	10	10	9	9	9
Cap, veh/h	202	1479	80	138	1981	461	131	273		225	461	
Arrive On Green	0.11	0.58	0.58	0.09	0.56	0.56	0.08	0.08	0.00	0.13	0.14	0.00
Sat Flow, veh/h	1753	2564	139	1555	3597	838	1668	3416	0	1682	3445	0
Grp Volume(v), veh/h	163	903	481	119	254	133	44	159	0	202	124	0
Grp Sat Flow(s),veh/h/ln	1753	882	939	1555	1486	1462	1668	1664	0	1682	1678	0
Q Serve(g_s), s	13.7	66.6	66.6	11.3	6.2	6.6	3.7	6.9	0.0	17.7	5.0	0.0
Cycle Q Clear(g_c), s	13.7	66.6	66.6	11.3	6.2	6.6	3.7	6.9	0.0	17.7	5.0	0.0
Prop In Lane	1.00		0.15	1.00		0.57	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	202	1018	542	138	1637	805	131	273		225	461	
V/C Ratio(X)	0.81	0.89	0.89	0.86	0.16	0.16	0.34	0.58		0.90	0.27	
Avail Cap(c_a), veh/h	270	1018	542	170	1663	818	157	710		371	1141	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.85	0.85	0.85	0.96	0.96	0.96	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	65.6	27.5	27.5	67.5	16.6	16.7	65.4	66.4	0.0	64.0	58.0	0.0
Incr Delay (d2), s/veh	7.9	9.9	16.7	25.2	0.2	0.4	0.6	0.7	0.0	9.4	0.1	0.0
Initial Q Delay(d3),s/veh	23.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.7	15.0	17.1	5.5	2.2	2.4	1.6	3.0	0.0	8.2	2.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	96.6	37.4	44.2	92.6	16.8	17.1	66.0	67.1	0.0	73.4	58.1	0.0
LnGrp LOS	F	D	D	F	B	B	E	E		E	E	
Approach Vol, veh/h		1547			506			203	A		326	A
Approach Delay, s/veh		45.8			34.7			66.9			67.5	
Approach LOS		D			C			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.3	91.5	15.8	25.5	19.9	88.8	24.1	17.2
Change Period (Y+Rc), s	4.0	4.9	4.0	* 4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	16.4	50.7	14.1	* 51	23.1	44.0	33.1	32.0
Max Q Clear Time (g_c+I1), s	13.3	68.6	5.7	7.0	15.7	8.6	19.7	8.9
Green Ext Time (p_c), s	0.1	0.0	0.0	0.5	0.2	1.7	0.3	0.6

Intersection Summary	
HCM 6th Ctrl Delay	48.0
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	378	1225	140	34	337	17	79	114	173	104	84	96
Future Volume (veh/h)	378	1225	140	34	337	17	79	114	173	104	84	96
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.89	1.00		0.98	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1618	1618	1618	1752	1752	1752	1663	1663	1663
Adj Flow Rate, veh/h	394	1276	146	35	351	16	82	119	14	108	88	17
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	6	6	6	19	19	19	10	10	10	16	16	16
Cap, veh/h	1510	1867	213	110	643	29	148	156	129	182	192	156
Arrive On Green	0.45	0.60	0.60	0.07	0.22	0.22	0.09	0.09	0.09	0.12	0.12	0.12
Sat Flow, veh/h	3346	3104	353	1541	2977	135	1668	1752	1448	1584	1663	1350
Grp Volume(v), veh/h	394	705	717	35	180	187	82	119	14	108	88	17
Grp Sat Flow(s),veh/h/ln	1673	1721	1737	1541	1537	1575	1668	1752	1448	1584	1663	1350
Q Serve(g_s), s	11.0	41.4	42.1	3.2	15.6	15.8	7.1	10.0	1.3	9.7	7.4	1.7
Cycle Q Clear(g_c), s	11.0	41.4	42.1	3.2	15.6	15.8	7.1	10.0	1.3	9.7	7.4	1.7
Prop In Lane	1.00		0.20	1.00		0.09	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1510	1035	1045	110	332	340	148	156	129	182	192	156
V/C Ratio(X)	0.26	0.68	0.69	0.32	0.54	0.55	0.55	0.76	0.11	0.59	0.46	0.11
Avail Cap(c_a), veh/h	1510	1035	1045	144	332	340	301	316	262	433	455	369
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.09	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.6	20.2	20.3	66.1	52.2	52.3	65.5	66.8	62.9	63.0	62.0	59.5
Incr Delay (d2), s/veh	0.0	0.3	0.3	0.6	6.3	6.2	1.2	2.9	0.1	1.1	0.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	16.2	16.6	1.3	6.7	6.9	3.1	4.6	0.5	4.0	3.2	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.6	20.5	20.6	66.7	58.5	58.5	66.7	69.7	63.0	64.2	62.6	59.6
LnGrp LOS	C	C	C	E	E	E	E	E	E	E	E	E
Approach Vol, veh/h		1816			402			215			213	
Approach Delay, s/veh		21.7			59.2			68.1			63.2	
Approach LOS		C			E			E			E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	72.6	37.3		22.2	14.7	95.1		17.9				
Change Period (Y+Rc), s	4.9	* 4.9		4.9	4.0	4.9		4.6				
Max Green Setting (Gmax), s	31.1	* 32		41.0	14.0	50.0		27.1				
Max Q Clear Time (g_c+I1), s	13.0	17.8		11.7	5.2	44.1		12.0				
Green Ext Time (p_c), s	1.7	1.2		0.6	0.0	4.1		0.5				

Intersection Summary			
HCM 6th Ctrl Delay			34.5
HCM 6th LOS			C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	314	368	29	159	18	330	456	349	22	116	187
Future Volume (veh/h)	96	314	368	29	159	18	330	456	349	22	116	187
Initial Q (Qb), veh	0	13	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		1.00	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1722	1722	1722	1574	1574	1574	1811	1811	1811	1663	1663	1663
Adj Flow Rate, veh/h	103	338	116	31	171	15	355	490	0	24	125	13
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	12	12	12	22	22	22	6	6	6	16	16	16
Cap, veh/h	226	408	339	85	213	19	1441	1482		164	172	139
Arrive On Green	0.04	0.07	0.07	0.06	0.15	0.15	0.45	0.45	0.00	0.10	0.10	0.10
Sat Flow, veh/h	1640	1722	1430	1499	1422	125	3346	3532	0	1584	1663	1338
Grp Volume(v), veh/h	103	338	116	31	0	186	355	490	0	24	125	13
Grp Sat Flow(s),veh/h/ln	1640	1722	1430	1499	0	1546	1673	1721	0	1584	1663	1338
Q Serve(g_s), s	6.5	20.4	8.1	2.1	0.0	12.2	6.9	9.7	0.0	1.4	7.7	0.9
Cycle Q Clear(g_c), s	6.5	20.4	8.1	2.1	0.0	12.2	6.9	9.7	0.0	1.4	7.7	0.9
Prop In Lane	1.00		1.00	1.00		0.08	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	226	408	339	85	0	232	1441	1482		164	172	139
V/C Ratio(X)	0.46	0.83	0.34	0.36	0.00	0.80	0.25	0.33		0.15	0.73	0.09
Avail Cap(c_a), veh/h	201	426	354	144	0	364	1492	1535		353	371	298
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.89	0.89	0.89	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.3	47.9	40.7	47.7	0.0	43.1	19.1	19.9	0.0	42.8	45.6	42.6
Incr Delay (d2), s/veh	0.6	10.9	0.4	1.0	0.0	3.1	0.4	0.6	0.0	0.2	2.2	0.1
Initial Q Delay(d3),s/veh	0.0	42.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	17.0	3.0	0.8	0.0	4.8	2.8	4.0	0.0	0.6	3.3	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.9	101.5	41.1	48.7	0.0	46.2	19.5	20.5	0.0	43.0	47.8	42.7
LnGrp LOS	D	F	D	D	A	D	B	C		D	D	D
Approach Vol, veh/h		557			217			845	A		162	
Approach Delay, s/veh		78.8			46.6			20.0			46.7	
Approach LOS		E			D			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.0	27.8		51.4	17.4	20.3		15.8				
Change Period (Y+Rc), s	4.0	4.6		4.6	4.6	* 4.6		4.9				
Max Green Setting (Gmax), s	10.1	26.0		27.4	11.4	* 25		23.4				
Max Q Clear Time (g_c+I1), s	4.1	22.4		11.7	8.5	14.2		9.7				
Green Ext Time (p_c), s	0.0	0.7		2.8	0.0	0.4		0.4				

Intersection Summary			
HCM 6th Ctrl Delay			44.1
HCM 6th LOS			D

Notes

User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	122	182	147	307	167	168	160	39	404	202	644	98
Future Volume (veh/h)	122	182	147	307	167	168	160	39	404	202	644	98
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1441	1441	1441	1618	1618	1618	1796	1796	1796	1811	1811	1811
Adj Flow Rate, veh/h	107	222	0	323	176	0	168	41	0	213	678	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	31	31	31	19	19	19	7	7	7	6	6	6
Cap, veh/h	148	311		471	247		198	870		523	1551	
Arrive On Green	0.11	0.11	0.00	0.05	0.05	0.00	0.12	0.25	0.00	0.30	0.45	0.00
Sat Flow, veh/h	1372	2881	1221	3083	1618	1372	1711	3503	0	1725	3441	1535
Grp Volume(v), veh/h	107	222	0	323	176	0	168	41	0	213	678	0
Grp Sat Flow(s),veh/h/ln	1372	1441	1221	1541	1618	1372	1711	1706	0	1725	1721	1535
Q Serve(g_s), s	7.9	7.8	0.0	10.8	11.2	0.0	10.1	1.0	0.0	10.3	14.2	0.0
Cycle Q Clear(g_c), s	7.9	7.8	0.0	10.8	11.2	0.0	10.1	1.0	0.0	10.3	14.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	148	311		471	247		198	870		523	1551	
V/C Ratio(X)	0.72	0.71		0.69	0.71		0.85	0.05		0.41	0.44	
Avail Cap(c_a), veh/h	289	606		611	321		293	870		523	1551	
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.88	0.88	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	45.3	45.3	0.0	47.4	47.6	0.0	45.5	29.5	0.0	29.1	19.7	0.0
Incr Delay (d2), s/veh	2.5	1.1	0.0	1.9	4.5	0.0	9.5	0.0	0.0	0.2	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	2.8	0.0	4.6	5.2	0.0	4.7	0.4	0.0	4.2	5.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.8	46.4	0.0	49.3	52.0	0.0	55.0	29.5	0.0	29.3	20.6	0.0
LnGrp LOS	D	D		D	D		D	C		C	C	
Approach Vol, veh/h		329	A		499	A		209	A		891	A
Approach Delay, s/veh		46.8			50.2			50.0			22.7	
Approach LOS		D			D			D			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	16.2	52.2		15.9	36.7	31.7		20.7				
Change Period (Y+Rc), s	4.0	4.9		4.6	4.9	* 4.9		4.6				
Max Green Setting (Gmax), s	18.0	26.0		22.1	19.1	* 25		20.8				
Max Q Clear Time (g_c+I1), s	12.1	16.2		9.9	12.3	3.0		13.2				
Green Ext Time (p_c), s	0.2	3.5		0.9	0.2	0.1		1.6				

Intersection Summary			
HCM 6th Ctrl Delay			36.9
HCM 6th LOS			D

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	0	6	3	0	12	18	329	5	18	500	45
Future Volume (veh/h)	25	0	6	3	0	12	18	329	5	18	500	45
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.95		1.00	0.95		1.00	1.00		0.96	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1752	1752	1752	1500	1500	1500	1707	1707	1707	1796	1796	1796
Adj Flow Rate, veh/h	27	0	0	3	0	0	19	354	5	19	538	45
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	10	10	10	27	27	27	13	13	13	7	7	7
Cap, veh/h	264	0	194	245	0	0	28	2230	31	30	2165	181
Arrive On Green	0.13	0.00	0.00	0.13	0.00	0.00	0.02	0.68	0.68	0.02	0.68	0.68
Sat Flow, veh/h	1266	0	1485	1123	0	0	1626	3273	46	1711	3178	265
Grp Volume(v), veh/h	27	0	0	3	0	0	19	175	184	19	288	295
Grp Sat Flow(s),veh/h/ln	1266	0	1485	1123	0	0	1626	1622	1697	1711	1706	1736
Q Serve(g_s), s	1.2	0.0	0.0	0.0	0.0	0.0	0.9	2.8	2.8	0.8	4.8	4.8
Cycle Q Clear(g_c), s	1.4	0.0	0.0	0.1	0.0	0.0	0.9	2.8	2.8	0.8	4.8	4.8
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.03	1.00		0.15
Lane Grp Cap(c), veh/h	264	0	194	245	0	0	28	1105	1156	30	1163	1183
V/C Ratio(X)	0.10	0.00	0.00	0.01	0.00	0.00	0.67	0.16	0.16	0.63	0.25	0.25
Avail Cap(c_a), veh/h	511	0	486	458	0	0	532	1105	1156	559	1163	1183
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.3	0.0	0.0	27.8	0.0	0.0	35.8	4.2	4.2	35.8	4.5	4.5
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.0	0.0	0.0	9.6	0.3	0.3	8.0	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	0.0	0.0	0.0	0.4	0.8	0.8	0.4	1.4	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.4	0.0	0.0	27.8	0.0	0.0	45.4	4.5	4.5	43.8	5.0	5.0
LnGrp LOS	C	A	A	C	A	A	D	A	A	D	A	A
Approach Vol, veh/h		27			3			378			602	
Approach Delay, s/veh		28.4			27.8			6.5			6.2	
Approach LOS		C			C			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.3	54.5		13.6	5.3	54.5		13.6				
Change Period (Y+Rc), s	4.0	4.5		4.0	4.0	4.5		4.0				
Max Green Setting (Gmax), s	24.0	30.0		24.0	24.0	50.0		24.0				
Max Q Clear Time (g_c+I1), s	2.8	4.8		3.4	2.9	6.8		2.1				
Green Ext Time (p_c), s	0.0	1.4		0.0	0.0	2.5		0.0				

Intersection Summary			
HCM 6th Ctrl Delay			7.0
HCM 6th LOS			A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	501	1134	558	197	153	249	215	55	733	0	0	0
Future Volume (veh/h)	501	1134	558	197	153	249	215	55	733	0	0	0
Initial Q (Qb), veh	16	8	16	0	0	0	0	0	10			
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	1870	1648	1648	1648	1856	1856	1856			
Adj Flow Rate, veh/h	516	1169	287	203	158	89	222	57	756			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	2	2	2	17	17	17	3	3	3			
Cap, veh/h	723	1687	694	294	564	841	991	536	1067			
Arrive On Green	0.19	0.45	0.45	0.10	0.36	0.36	0.29	0.29	0.29			
Sat Flow, veh/h	3563	3741	1542	3045	1648	2458	3428	1856	2768			
Grp Volume(v), veh/h	516	1169	287	203	158	89	222	57	756			
Grp Sat Flow(s),veh/h/ln	1781	1870	1542	1522	1648	1229	1714	1856	1384			
Q Serve(g_s), s	10.4	18.8	9.5	4.9	5.1	1.8	3.7	1.7	17.5			
Cycle Q Clear(g_c), s	10.4	18.8	9.5	4.9	5.1	1.8	3.7	1.7	17.5			
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	723	1687	694	294	564	841	991	536	1067			
V/C Ratio(X)	0.71	0.69	0.41	0.69	0.28	0.11	0.22	0.11	0.71			
Avail Cap(c_a), veh/h	1371	1886	777	1091	831	1239	1228	665	1259			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	28.9	17.0	15.5	33.4	18.5	17.4	20.6	19.9	20.3			
Incr Delay (d2), s/veh	1.0	1.1	0.6	1.1	0.4	0.1	0.0	0.0	1.1			
Initial Q Delay(d3),s/veh	12.3	0.5	6.5	0.0	0.0	0.0	0.0	0.0	2.2			
%ile BackOfQ(50%),veh/ln	6.4	8.4	6.1	1.8	2.0	0.5	1.5	0.7	11.9			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.2	18.6	22.6	34.5	18.9	17.5	20.7	19.9	23.6			
LnGrp LOS	D	B	C	C	B	B	C	B	C			
Approach Vol, veh/h		1972			450			1035				
Approach Delay, s/veh		25.4			25.7			22.8				
Approach LOS		C			C			C				
Timer - Assigned Phs	1	2		4	5	6						
Phs Duration (G+Y+Rc), s	10.8	39.0		25.6	17.7	32.1						
Change Period (Y+Rc), s	3.5	5.0		4.0	3.5	5.0						
Max Green Setting (Gmax), s	27.0	38.0		27.0	29.0	38.0						
Max Q Clear Time (g_c+I1), s	6.9	20.8		19.5	12.4	7.1						
Green Ext Time (p_c), s	0.5	13.2		2.1	1.9	2.6						
Intersection Summary												
HCM 6th Ctrl Delay			24.6									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	386	1615	94	4	317	25	59	4	6	36	2	92
Future Volume (veh/h)	386	1615	94	4	317	25	59	4	6	36	2	92
Initial Q (Qb), veh	0	32	0	0	26	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1574	1574	1574	1366	1366	1366	1678	1678	1678
Adj Flow Rate, veh/h	420	1755	100	4	345	24	64	4	0	39	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	22	22	22	36	36	36	15	15	15
Cap, veh/h	494	2333	117	9	1558	100	156	163	0	59	3	97
Arrive On Green	0.14	0.68	0.68	0.01	0.55	0.55	0.12	0.12	0.00	0.04	0.04	0.00
Sat Flow, veh/h	3428	3384	191	1499	2835	196	1301	1366	0	1523	78	2502
Grp Volume(v), veh/h	420	906	949	4	181	188	64	4	0	41	0	0
Grp Sat Flow(s),veh/h/ln	1714	1763	1812	1499	1495	1535	1301	1366	0	1602	0	1251
Q Serve(g_s), s	13.1	36.7	38.2	0.3	6.9	7.0	5.0	0.3	0.0	2.8	0.0	0.0
Cycle Q Clear(g_c), s	13.1	36.7	38.2	0.3	6.9	7.0	5.0	0.3	0.0	2.8	0.0	0.0
Prop In Lane	1.00		0.11	1.00		0.13	1.00		0.00	0.95		1.00
Lane Grp Cap(c), veh/h	494	1206	1243	9	817	840	156	163	0	62	0	97
V/C Ratio(X)	0.85	0.75	0.76	0.43	0.22	0.22	0.41	0.02	0.00	0.66	0.00	0.00
Avail Cap(c_a), veh/h	686	1206	1240	123	817	839	367	385	0	160	0	250
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.09	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	45.9	12.6	12.7	54.5	13.9	13.8	44.8	42.8	0.0	52.1	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.4	0.4	10.9	0.6	0.6	0.6	0.0	0.0	4.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	5.1	5.0	0.0	2.3	2.2	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	16.8	17.7	0.1	4.3	4.4	1.7	0.1	0.0	1.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.4	18.1	18.2	65.4	16.8	16.7	45.5	42.8	0.0	56.4	0.0	0.0
LnGrp LOS	D	B	B	E	B	B	D	D	A	E	A	A
Approach Vol, veh/h		2275			373			68			41	
Approach Delay, s/veh		23.4			17.3			45.3			56.4	
Approach LOS		C			B			D			E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	19.9	64.7		17.2	4.7	79.9		8.3				
Change Period (Y+Rc), s	4.0	4.6		4.0	4.0	4.6		4.0				
Max Green Setting (Gmax), s	22.0	29.4		31.0	9.0	42.4		11.0				
Max Q Clear Time (g_c+I1), s	15.1	9.0		7.0	2.3	40.2		4.8				
Green Ext Time (p_c), s	0.7	1.9		0.1	0.0	1.7		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			23.6									
HCM 6th LOS			C									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	1423	35	74	155	139	23	188	378	392	328	211
Future Volume (veh/h)	142	1423	35	74	155	139	23	188	378	392	328	211
Initial Q (Qb), veh	0	50	0	0	0	0	0	0	12	24	24	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1826	1826	1826	1870	1870	1870	1826	1826	1826
Adj Flow Rate, veh/h	149	1498	34	78	163	47	24	198	398	413	345	47
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	5	5	5	2	2	2	5	5	5
Cap, veh/h	186	1895	28	325	984	275	83	272	687	549	848	387
Arrive On Green	0.10	0.36	0.36	0.12	0.39	0.39	0.05	0.14	0.14	0.15	0.24	0.24
Sat Flow, veh/h	1795	5174	117	3374	2677	749	1781	1870	2790	3374	3469	1501
Grp Volume(v), veh/h	149	993	539	78	104	106	24	198	398	413	345	47
Grp Sat Flow(s),veh/h/ln	1795	1716	1861	1687	1735	1691	1781	1870	1395	1687	1735	1501
Q Serve(g_s), s	6.5	20.8	20.8	1.7	3.1	3.3	1.0	8.2	2.6	9.5	6.7	2.0
Cycle Q Clear(g_c), s	6.5	20.8	20.8	1.7	3.1	3.3	1.0	8.2	2.6	9.5	6.7	2.0
Prop In Lane	1.00		0.06	1.00		0.44	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	186	1244	678	325	638	622	83	272	687	549	848	387
V/C Ratio(X)	0.80	0.80	0.80	0.24	0.16	0.17	0.29	0.73	0.58	0.75	0.41	0.12
Avail Cap(c_a), veh/h	292	1244	675	394	673	656	200	304	779	590	821	355
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.98	0.98	0.98	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.0	24.3	24.1	33.5	17.0	17.1	36.9	32.7	11.6	33.0	26.2	22.8
Incr Delay (d2), s/veh	3.7	5.4	9.4	0.1	0.5	0.6	0.7	6.0	0.4	4.3	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	25.7	21.3	0.0	0.0	0.0	0.0	0.0	5.2	55.8	9.7	0.0
%ile BackOfQ(50%),veh/ln	3.0	15.1	16.1	0.7	1.3	1.3	0.5	3.9	2.4	9.2	4.7	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.8	55.4	54.7	33.6	17.6	17.7	37.6	38.7	17.2	93.1	36.1	22.9
LnGrp LOS	D	E	D	C	B	B	D	D	B	F	D	C
Approach Vol, veh/h		1681			288			620			805	
Approach Delay, s/veh		53.7			22.0			24.9			64.6	
Approach LOS		D			C			C			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.7	23.9	12.3	36.1	15.8	15.8	14.3	34.0				
Change Period (Y+Rc), s	4.0	5.0	4.0	5.0	4.0	5.0	5.0	* 5				
Max Green Setting (Gmax), s	9.0	18.0	13.0	22.0	14.0	13.0	6.0	* 29				
Max Q Clear Time (g_c+I1), s	3.0	8.7	8.5	5.3	11.5	10.2	3.7	22.8				
Green Ext Time (p_c), s	0.0	1.0	0.1	0.6	0.3	0.6	0.0	3.8				
Intersection Summary												
HCM 6th Ctrl Delay			48.3									
HCM 6th LOS			D									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

User approved changes to right turn type.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	889	2	74	1	0	5	40	109	1	2	150	603
Future Volume (veh/h)	889	2	74	1	0	5	40	109	1	2	150	603
Initial Q (Qb), veh	24	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1411	1411	1411	1781	1781	1781	1767	1767	1767
Adj Flow Rate, veh/h	967	0	40	1	0	0	43	118	0	2	163	465
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	33	33	33	8	8	8	9	9	9
Cap, veh/h	1375	0	612	3	0	0	65	656	0	94	447	1695
Arrive On Green	0.37	0.00	0.37	0.00	0.00	0.00	0.04	0.38	0.00	0.26	0.26	0.26
Sat Flow, veh/h	3534	0	1572	1344	0	0	1697	1781	0	5	1759	2635
Grp Volume(v), veh/h	967	0	40	1	0	0	43	118	0	165	0	465
Grp Sat Flow(s),veh/h/ln	1767	0	1572	1344	0	0	1697	1781	0	1764	0	1317
Q Serve(g_s), s	9.0	0.0	0.6	0.0	0.0	0.0	1.0	1.7	0.0	0.0	0.0	3.0
Cycle Q Clear(g_c), s	9.0	0.0	0.6	0.0	0.0	0.0	1.0	1.7	0.0	2.9	0.0	3.0
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.00	0.01		1.00
Lane Grp Cap(c), veh/h	1375	0	612	3	0	0	65	656	0	541	0	1695
V/C Ratio(X)	0.70	0.00	0.07	0.29	0.00	0.00	0.67	0.18	0.00	0.30	0.00	0.27
Avail Cap(c_a), veh/h	2776	0	1235	704	0	0	889	2706	0	1707	0	3393
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.6	0.0	7.5	19.8	0.0	0.0	18.9	8.6	0.0	12.3	0.0	3.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	41.7	0.0	0.0	11.2	0.1	0.0	0.3	0.0	0.1
Initial Q Delay(d3),s/veh	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	0.0	0.2	0.0	0.0	0.0	0.5	0.5	0.0	1.0	0.0	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.2	0.0	7.6	61.5	0.0	0.0	30.1	8.7	0.0	12.6	0.0	3.1
LnGrp LOS	B	A	A	E	A	A	C	A	A	B	A	A
Approach Vol, veh/h		1007			1			161			630	
Approach Delay, s/veh		17.8			61.5			14.4			5.6	
Approach LOS		B			E			B			A	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	4.5	13.5		3.0		18.0		17.2				
Change Period (Y+Rc), s	3.0	3.5		3.0		3.5		3.0				
Max Green Setting (Gmax), s	20.0	35.0		20.0		58.0		30.0				
Max Q Clear Time (g_c+I1), s	3.0	5.0		2.0		3.7		11.0				
Green Ext Time (p_c), s	0.1	2.7		0.0		0.3		3.1				
Intersection Summary												
HCM 6th Ctrl Delay			13.3									
HCM 6th LOS			B									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	186	205	82	192	110	59	33	333	282	383	391	124
Future Volume (vph)	186	205	82	192	110	59	33	333	282	383	391	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
Lane Util. Factor		0.95		0.97	1.00	1.00	1.00	0.95	1.00	0.91	0.91	1.00
Frpb, ped/bikes		0.98		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92
Flpb, ped/bikes		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.99	1.00
Satd. Flow (prot)		2996		2814	1527	1298	1464	2927	1309	1421	2956	1281
Flt Permitted		0.98		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.99	1.00
Satd. Flow (perm)		2996		2814	1527	1298	1464	2927	1309	1421	2956	1281
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	196	216	86	202	116	62	35	351	297	403	412	131
RTOR Reduction (vph)	0	18	0	0	0	56	0	0	0	0	0	85
Lane Group Flow (vph)	0	480	0	202	116	6	35	351	297	266	549	46
Confl. Peds. (#/hr)			58									20
Confl. Bikes (#/hr)			9						3			3
Heavy Vehicles (%)	2%	2%	2%	12%	12%	12%	11%	11%	11%	4%	4%	4%
Turn Type	Split	NA		Split	NA	Perm	Split	NA	custom	Split	NA	Perm
Protected Phases	4	4		7	7		6	6	2 6 7!	2!	2	
Permitted Phases						7						2
Actuated Green, G (s)		22.6		11.0	11.0	11.0	16.2	16.2	73.5	36.5	36.5	36.5
Effective Green, g (s)		22.6		11.0	11.0	11.0	16.2	16.2	73.5	36.5	36.5	36.5
Actuated g/C Ratio		0.22		0.10	0.10	0.10	0.15	0.15	0.70	0.35	0.35	0.35
Clearance Time (s)		4.0		4.9	4.9	4.9	4.9	4.9		4.9	4.9	4.9
Vehicle Extension (s)		2.0		3.0	3.0	3.0	2.5	2.5		2.0	2.0	2.0
Lane Grp Cap (vph)		644		294	159	135	225	451	916	493	1027	445
v/s Ratio Prot		c0.16		0.07	c0.08		0.02	c0.12	0.23	c0.19	0.19	
v/s Ratio Perm						0.01						0.04
v/c Ratio		0.75		0.69	0.73	0.05	0.16	0.78	0.32	0.54	0.53	0.10
Uniform Delay, d1		38.5		45.3	45.6	42.3	38.5	42.7	6.1	27.5	27.4	23.2
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		4.1		6.5	15.4	0.1	0.2	7.9	0.2	4.2	2.0	0.5
Delay (s)		42.6		51.9	61.0	42.4	38.7	50.6	6.3	31.7	29.4	23.6
Level of Service		D		D	E	D	D	D	A	C	C	C
Approach Delay (s)		42.6			53.1			30.7			29.3	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	35.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	18.7
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	37	833	504	40	54	19
Future Volume (vph)	37	833	504	40	54	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9	4.9		4.2	4.2
Lane Util. Factor	1.00	0.91	0.91		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1736	4988	4540		1703	1524
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1736	4988	4540		1703	1524
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	40	896	542	43	58	20
RTOR Reduction (vph)	0	0	3	0	0	18
Lane Group Flow (vph)	40	896	582	0	58	2
Heavy Vehicles (%)	4%	4%	13%	13%	6%	6%
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	5	2	6		3	
Permitted Phases						3
Actuated Green, G (s)	5.5	81.3	71.8		9.6	9.6
Effective Green, g (s)	5.5	81.3	71.8		9.6	9.6
Actuated g/C Ratio	0.06	0.81	0.72		0.10	0.10
Clearance Time (s)	4.0	4.9	4.9		4.2	4.2
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	95	4055	3259		163	146
v/s Ratio Prot	c0.02	c0.18	0.13		c0.03	
v/s Ratio Perm						0.00
v/c Ratio	0.42	0.22	0.18		0.36	0.01
Uniform Delay, d1	45.7	2.1	4.6		42.3	40.9
Progression Factor	1.00	1.00	0.96		1.00	1.00
Incremental Delay, d2	1.1	0.1	0.1		0.5	0.0
Delay (s)	46.8	2.3	4.5		42.8	40.9
Level of Service	D	A	A		D	D
Approach Delay (s)		4.2	4.5		42.3	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	6.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.1
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBU	EBL	EBT	EBR	WBL2	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	1	318	1257	291	46	402	20	172	92	127	7	16
Future Volume (vph)	1	318	1257	291	46	402	20	172	92	127	7	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.6		4.0	4.6		4.0	4.0	4.0		4.0
Lane Util. Factor		1.00	0.91		1.00	0.91		0.91	0.91	1.00		0.95
Frpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00	0.93		0.99
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00
Frt		1.00	0.97		1.00	0.99		1.00	1.00	0.85		0.92
Flt Protected		0.95	1.00		0.95	1.00		0.95	0.99	1.00		0.99
Satd. Flow (prot)		1752	4877		1480	4213		3042	1588	1395		2789
Flt Permitted		0.95	1.00		0.95	1.00		0.95	0.99	1.00		0.99
Satd. Flow (perm)		1752	4877		1480	4213		3042	1588	1395		2789
Peak-hour factor, PHF	0.92	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	1	361	1428	331	52	457	23	195	105	144	8	18
RTOR Reduction (vph)	0	0	0	0	0	4	0	0	0	116	0	51
Lane Group Flow (vph)	0	362	1759	0	52	476	0	175	125	28	0	2
Confl. Peds. (#/hr)							9			51		
Confl. Bikes (#/hr)				9			1			4		
Heavy Vehicles (%)	2%	3%	3%	3%	22%	22%	22%	8%	8%	8%	17%	17%
Turn Type	Prot	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA
Protected Phases	1	1	6		5	2		4	4		7	7
Permitted Phases										4		
Actuated Green, G (s)		14.6	36.4		7.3	29.1		22.8	22.8	22.8		3.4
Effective Green, g (s)		14.6	36.4		7.3	29.1		22.8	22.8	22.8		3.4
Actuated g/C Ratio		0.12	0.31		0.06	0.24		0.19	0.19	0.19		0.03
Clearance Time (s)		4.0	4.6		4.0	4.6		4.0	4.0	4.0		4.0
Vehicle Extension (s)		2.0	3.0		2.0	3.0		2.0	2.0	2.0		2.0
Lane Grp Cap (vph)		214	1491		90	1030		582	304	267		79
v/s Ratio Prot		c0.21	c0.36		0.04	0.11		0.06	c0.08			c0.00
v/s Ratio Perm										0.02		
v/c Ratio		1.69	1.18		0.58	0.46		0.30	0.41	0.10		0.02
Uniform Delay, d1		52.2	41.3		54.4	38.3		41.3	42.2	39.7		56.2
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00
Incremental Delay, d2		330.6	88.2		5.5	0.3		0.1	0.3	0.1		0.0
Delay (s)		382.8	129.5		59.8	38.6		41.4	42.5	39.7		56.2
Level of Service		F	F		E	D		D	D	D		E
Approach Delay (s)			172.7			40.7			41.2			56.2
Approach LOS			F			D			D			E

Intersection Summary			
HCM 2000 Control Delay	111.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	119.0	Sum of lost time (s)	21.1
Intersection Capacity Utilization	97.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR2	NER	NER2
Lane Configurations			
Traffic Volume (vph)	24	704	319
Future Volume (vph)	24	704	319
Ideal Flow (vphpl)	1900	1990	1900
Total Lost time (s)		4.5	4.5
Lane Util. Factor		*0.95	1.00
Frpb, ped/bikes		1.00	1.00
Flpb, ped/bikes		1.00	1.00
Frt		1.00	0.85
Flt Protected		1.00	1.00
Satd. Flow (prot)		3781	1615
Flt Permitted		1.00	1.00
Satd. Flow (perm)		3781	1615
Peak-hour factor, PHF	0.88	0.88	0.88
Adj. Flow (vph)	27	800	362
RTOR Reduction (vph)	0	0	0
Lane Group Flow (vph)	0	800	363
Confl. Peds. (#/hr)			63
Confl. Bikes (#/hr)	2		
Heavy Vehicles (%)	17%	0%	0%
Turn Type		Prot	Prot
Protected Phases		3	3
Permitted Phases			
Actuated Green, G (s)		28.0	28.0
Effective Green, g (s)		28.0	28.0
Actuated g/C Ratio		0.24	0.24
Clearance Time (s)		4.5	4.5
Vehicle Extension (s)		2.0	2.0
Lane Grp Cap (vph)		889	380
v/s Ratio Prot		0.21	c0.22
v/s Ratio Perm			
v/c Ratio		0.90	0.96
Uniform Delay, d1		44.1	44.9
Progression Factor		1.00	1.00
Incremental Delay, d2		11.6	34.1
Delay (s)		55.7	79.0
Level of Service		E	E
Approach Delay (s)			
Approach LOS			

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	477	3	1	116	24	2	2	0	51	2	70
Future Volume (vph)	135	477	3	1	116	24	2	2	0	51	2	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.97			1.00			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.95	1.00
Satd. Flow (prot)	1752	3502		1378	2670			1854			1523	1357
Flt Permitted	0.95	1.00		0.95	1.00			1.00			0.73	1.00
Satd. Flow (perm)	1752	3502		1378	2670			1900			1167	1357
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	157	555	3	1	135	28	2	2	0	59	2	81
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	71
Lane Group Flow (vph)	157	558	0	1	163	0	0	4	0	0	61	10
Confl. Peds. (#/hr)						11						
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	3%	3%	3%	31%	31%	31%	0%	0%	0%	19%	19%	19%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			3			4	
Permitted Phases							3			4		4
Actuated Green, G (s)	9.1	27.5		0.6	19.0			0.6			6.2	6.2
Effective Green, g (s)	9.1	27.5		0.6	19.0			0.6			6.2	6.2
Actuated g/C Ratio	0.18	0.54		0.01	0.37			0.01			0.12	0.12
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Vehicle Extension (s)	2.0	2.5		2.0	2.5			2.0			2.0	2.0
Lane Grp Cap (vph)	313	1892		16	996			22			142	165
v/s Ratio Prot	c0.09	c0.16		0.00	0.06							
v/s Ratio Perm								c0.00			c0.05	0.01
v/c Ratio	0.50	0.29		0.06	0.16			0.18			0.43	0.06
Uniform Delay, d1	18.9	6.4		24.9	10.6			24.9			20.7	19.8
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.5	0.1		0.6	0.1			1.4			0.8	0.1
Delay (s)	19.3	6.5		25.5	10.7			26.4			21.5	19.8
Level of Service	B	A		C	B			C			C	B
Approach Delay (s)		9.3			10.8			26.4			20.5	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	50.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	35.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Intersection Delay, s/veh	21.1
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	79	24	104	419	2	318	0	73	0	1	0
Future Vol, veh/h	3	79	24	104	419	2	318	0	73	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	22	22	22	10	10	10	7	7	7	100	100	100
Mvmt Flow	3	83	25	109	441	2	335	0	77	0	1	0
Number of Lanes	0	1	1	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	11	24.1	19.9	12.2
HCM LOS	B	C	C	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	100%	0%	4%	0%	100%	0%	0%
Vol Thru, %	0%	0%	96%	0%	0%	100%	100%
Vol Right, %	0%	100%	0%	100%	0%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	318	73	82	24	104	421	1
LT Vol	318	0	3	0	104	0	0
Through Vol	0	0	79	0	0	419	1
RT Vol	0	73	0	24	0	2	0
Lane Flow Rate	335	77	86	25	109	443	1
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.656	0.125	0.173	0.045	0.207	0.773	0.003
Departure Headway (Hd)	7.059	5.846	7.199	6.464	6.791	6.28	9.069
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	512	612	497	552	529	576	393
Service Time	4.808	3.595	4.966	4.23	4.535	4.025	7.152
HCM Lane V/C Ratio	0.654	0.126	0.173	0.045	0.206	0.769	0.003
HCM Control Delay	22.3	9.4	11.5	9.5	11.3	27.3	12.2
HCM Lane LOS	C	A	B	A	B	D	B
HCM 95th-tile Q	4.7	0.4	0.6	0.1	0.8	7.1	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	4	61	8	4	12	27	572	5	8	197	12
Future Volume (veh/h)	130	4	61	8	4	12	27	572	5	8	197	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	22	0	0	0	0
Ped-Bike Adj(A_pbT)	0.96		0.96	0.96		0.95	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1648	1648	1648	1796	1796	1796	1811	1811	1811
Adj Flow Rate, veh/h	141	4	6	9	4	1	29	622	5	9	214	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	17	17	17	7	7	7	6	6	6
Cap, veh/h	334	117	176	301	222	56	83	2160	17	31	1979	92
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.05	0.62	0.62	0.02	0.59	0.59
Sat Flow, veh/h	1370	664	996	1193	1257	314	1711	3469	28	1725	3342	155
Grp Volume(v), veh/h	141	0	10	9	0	5	29	306	321	9	110	114
Grp Sat Flow(s),veh/h/ln	1370	0	1660	1193	0	1572	1711	1706	1790	1725	1721	1777
Q Serve(g_s), s	7.1	0.0	0.4	0.5	0.0	0.2	1.2	6.2	6.2	0.4	2.1	2.1
Cycle Q Clear(g_c), s	7.3	0.0	0.4	0.8	0.0	0.2	1.2	6.2	6.2	0.4	2.1	2.1
Prop In Lane	1.00		0.60	1.00		0.20	1.00		0.02	1.00		0.09
Lane Grp Cap(c), veh/h	334	0	293	301	0	278	83	1062	1114	31	1019	1052
V/C Ratio(X)	0.42	0.00	0.03	0.03	0.00	0.02	0.35	0.29	0.29	0.29	0.11	0.11
Avail Cap(c_a), veh/h	657	0	684	582	0	647	237	1062	1114	239	1019	1052
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.5	0.0	25.6	25.9	0.0	25.5	34.5	7.0	6.9	36.3	6.7	6.7
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.0	0.0	0.0	0.9	0.7	0.7	1.8	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	0.1	0.1	0.0	0.1	0.5	3.1	3.2	0.2	0.7	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.8	0.0	25.6	25.9	0.0	25.5	35.5	8.7	8.6	38.2	6.9	6.9
LnGrp LOS	C	A	C	C	A	C	D	A	A	D	A	A
Approach Vol, veh/h		151			14			656			233	
Approach Delay, s/veh		28.6			25.8			9.8			8.1	
Approach LOS		C			C			A			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.4	51.8		17.9	7.6	49.5		17.9				
Change Period (Y+Rc), s	4.0	5.1		4.6	4.0	5.1		4.6				
Max Green Setting (Gmax), s	10.4	20.0		30.9	10.4	20.0		30.9				
Max Q Clear Time (g_c+I1), s	2.4	8.2		9.3	3.2	4.1		2.8				
Green Ext Time (p_c), s	0.0	2.1		0.2	0.0	0.7		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			12.4									
HCM 6th LOS			B									

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	214	28	11	1381	233	229
Future Volume (veh/h)	214	28	11	1381	233	229
Initial Q (Qb), veh	0	0	0	0	5	0
Ped-Bike Adj(A_pbT)		0.96	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1781	1781	1856	1856	1781	1781
Adj Flow Rate, veh/h	216	19	11	1395	235	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	8	8	3	3	8	8
Cap, veh/h	3136	269	28	3778	296	
Arrive On Green	1.00	1.00	0.02	0.76	0.16	0.00
Sat Flow, veh/h	4706	390	1767	5233	1697	2657
Grp Volume(v), veh/h	152	83	11	1395	235	0
Grp Sat Flow(s),veh/h/ln	1621	1693	1767	1689	1697	1329
Q Serve(g_s), s	0.0	0.0	0.6	9.3	13.4	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.6	9.3	13.4	0.0
Prop In Lane		0.23	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2237	1168	28	3778	296	
V/C Ratio(X)	0.07	0.07	0.39	0.37	0.79	
Avail Cap(c_a), veh/h	2272	1186	141	3832	696	
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.84	0.84	1.00	0.00
Uniform Delay (d), s/veh	0.1	0.1	48.7	4.6	40.1	0.0
Incr Delay (d2), s/veh	0.1	0.1	2.8	0.2	4.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	10.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.3	2.8	7.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.2	0.2	51.5	4.9	55.0	0.0
LnGrp LOS	A	A	D	A	E	
Approach Vol, veh/h	235			1406	235	A
Approach Delay, s/veh	0.2			5.2	55.0	
Approach LOS	A			A	E	

Timer - Assigned Phs	1	2	6	8
Phs Duration (G+Y+Rc), s	5.6	74.1	79.6	20.4
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	8.0	39.0	51.0	41.0
Max Q Clear Time (g_c+I1), s	2.6	2.0	11.3	15.4
Green Ext Time (p_c), s	0.0	0.9	8.4	0.9

Intersection Summary	
HCM 6th Ctrl Delay	10.8
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	267	76	351	1134	177	75	122	70	59	289	183
Future Volume (veh/h)	100	267	76	351	1134	177	75	122	70	59	289	183
Initial Q (Qb), veh	0	0	0	0	34	0	0	0	0	0	32	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.95	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1722	1722	1722	1870	1870	1870	1767	1767	1767	1856	1856	1856
Adj Flow Rate, veh/h	103	275	51	362	1169	171	77	126	0	61	298	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	12	12	12	2	2	2	9	9	9	3	3	3
Cap, veh/h	415	1728	308	381	1776	219	151	502		152	505	
Arrive On Green	0.28	0.46	0.46	0.43	0.77	0.77	0.09	0.12	0.00	0.09	0.11	0.00
Sat Flow, veh/h	1640	4003	714	1781	4461	652	1682	3445	0	1767	3618	0
Grp Volume(v), veh/h	103	213	113	362	892	448	77	126	0	61	298	0
Grp Sat Flow(s),veh/h/ln	1640	1567	1583	1781	1702	1710	1682	1678	0	1767	1763	0
Q Serve(g_s), s	7.2	5.9	6.2	29.4	18.7	18.7	6.5	5.1	0.0	4.9	12.3	0.0
Cycle Q Clear(g_c), s	7.2	5.9	6.2	29.4	18.7	18.7	6.5	5.1	0.0	4.9	12.3	0.0
Prop In Lane	1.00		0.45	1.00		0.38	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	415	1353	683	381	1316	669	151	502		152	505	
V/C Ratio(X)	0.25	0.16	0.17	0.95	0.68	0.67	0.51	0.25		0.40	0.59	
Avail Cap(c_a), veh/h	463	1444	729	539	1316	661	214	866		225	917	
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.99	0.99	0.99	0.67	0.67	0.67	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	44.9	26.3	26.4	42.1	13.5	13.3	65.1	56.6	0.0	64.9	62.6	0.0
Incr Delay (d2), s/veh	0.1	0.2	0.5	14.4	1.9	3.6	1.0	0.1	0.0	0.6	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	6.6	6.3	0.0	0.0	0.0	0.0	70.3	0.0
%ile BackOfQ(50%),veh/ln	3.1	2.4	2.6	12.5	7.1	7.3	2.9	2.1	0.0	2.2	12.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.0	26.5	26.9	56.5	22.0	23.1	66.1	56.7	0.0	65.5	133.3	0.0
LnGrp LOS	D	C	C	E	C	C	E	E		E	F	
Approach Vol, veh/h		429			1702			203	A		359	A
Approach Delay, s/veh		31.1			29.6			60.3			121.8	
Approach LOS		C			C			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	36.1	74.0	18.3	21.5	47.2	62.9	16.9	23.0
Change Period (Y+Rc), s	4.0	4.9	4.9	* 4.6	4.9	* 4.9	4.0	4.9
Max Green Setting (Gmax), s	45.4	29.0	19.1	* 39	16.4	* 58	19.1	38.7
Max Q Clear Time (g_c+I1), s	31.4	8.2	8.5	14.3	9.2	20.7	6.9	7.1
Green Ext Time (p_c), s	0.7	1.3	0.1	1.1	0.1	7.3	0.1	0.5

Intersection Summary		
HCM 6th Ctrl Delay		44.5
HCM 6th LOS		D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	109	216	71	86	1100	14	188	34	29	36	186	374
Future Volume (veh/h)	109	216	71	86	1100	14	188	34	29	36	186	374
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.88	1.00		0.97	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1663	1663	1663	1856	1856	1856	1767	1767	1767	1826	1826	1826
Adj Flow Rate, veh/h	115	227	75	91	1158	14	224	0	2	38	196	166
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	16	16	16	3	3	3	9	9	9	5	5	5
Cap, veh/h	916	1266	406	161	1189	14	302	0	130	278	291	238
Arrive On Green	0.20	0.36	0.36	0.09	0.33	0.33	0.09	0.00	0.09	0.16	0.16	0.16
Sat Flow, veh/h	3072	2341	751	1767	3561	43	3365	0	1452	1739	1826	1493
Grp Volume(v), veh/h	115	151	151	91	573	599	224	0	2	38	196	166
Grp Sat Flow(s),veh/h/ln	1536	1580	1512	1767	1763	1841	1682	0	1452	1739	1826	1493
Q Serve(g_s), s	4.6	9.8	10.2	7.4	48.1	48.2	9.7	0.0	0.2	2.8	15.2	15.8
Cycle Q Clear(g_c), s	4.6	9.8	10.2	7.4	48.1	48.2	9.7	0.0	0.2	2.8	15.2	15.8
Prop In Lane	1.00		0.50	1.00		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	916	854	818	161	589	615	302	0	130	278	291	238
V/C Ratio(X)	0.13	0.18	0.18	0.56	0.97	0.97	0.74	0.00	0.02	0.14	0.67	0.70
Avail Cap(c_a), veh/h	916	854	818	284	589	615	628	0	271	475	499	408
HCM Platoon Ratio	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.98	0.98	0.98	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.0	25.1	25.2	65.3	49.3	49.3	66.6	0.0	62.2	54.2	59.3	59.6
Incr Delay (d2), s/veh	0.1	0.4	0.5	1.2	31.1	30.4	1.4	0.0	0.0	0.1	1.0	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	4.0	4.0	3.4	26.2	27.3	4.2	0.0	0.1	1.3	7.1	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.0	25.5	25.7	66.5	80.4	79.7	67.9	0.0	62.3	54.2	60.3	61.0
LnGrp LOS	D	C	C	E	F	E	E	A	E	D	E	E
Approach Vol, veh/h		417			1263			226			400	
Approach Delay, s/veh		30.7			79.1			67.9			60.0	
Approach LOS		C			E			E			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	48.7	55.0		27.9	18.6	85.1		18.3				
Change Period (Y+Rc), s	4.0	4.9		4.0	4.9	4.0		4.9				
Max Green Setting (Gmax), s	13.1	50.1		41.0	24.1	39.1		28.0				
Max Q Clear Time (g_c+I1), s	6.6	50.2		17.8	9.4	12.2		11.7				
Green Ext Time (p_c), s	0.2	0.0		1.2	0.1	1.7		0.5				

Intersection Summary			
HCM 6th Ctrl Delay			65.9
HCM 6th LOS			E

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	100	391	58	355	14	486	192	61	5	189	521
Future Volume (veh/h)	50	100	391	58	355	14	486	192	61	5	189	521
Initial Q (Qb), veh	0	0	0	0	25	0	0	0	0	0	72	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		1.00	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1781	1781	1811	1811	1811	1767	1767	1767	1841	1841	1841
Adj Flow Rate, veh/h	53	143	131	62	378	13	517	204	0	5	201	319
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	8	8	8	6	6	6	9	9	9	4	4	4
Cap, veh/h	127	481	402	137	493	4	833	856		391	410	332
Arrive On Green	0.07	0.23	0.23	0.08	0.24	0.24	0.29	0.29	0.00	0.22	0.22	0.22
Sat Flow, veh/h	1697	1781	1484	1725	1739	60	3264	3445	0	1753	1841	1489
Grp Volume(v), veh/h	53	143	131	62	0	391	517	204	0	5	201	319
Grp Sat Flow(s),veh/h/ln	1697	1781	1484	1725	0	1798	1632	1678	0	1753	1841	1489
Q Serve(g_s), s	3.1	7.0	7.8	3.6	0.0	22.2	14.0	4.8	0.0	0.2	10.0	22.2
Cycle Q Clear(g_c), s	3.1	7.0	7.8	3.6	0.0	22.2	14.0	4.8	0.0	0.2	10.0	22.2
Prop In Lane	1.00		1.00	1.00		0.03	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	127	481	402	137	0	494	833	856		391	410	332
V/C Ratio(X)	0.42	0.30	0.33	0.45	0.00	0.79	0.62	0.24		0.01	0.49	0.96
Avail Cap(c_a), veh/h	179	492	410	182	0	497	955	982		391	410	332
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.73	0.73	0.73	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.4	30.4	30.7	46.1	0.0	38.1	34.6	31.0	0.0	31.8	40.8	40.3
Incr Delay (d2), s/veh	0.6	0.2	0.3	0.9	0.0	7.8	3.5	0.7	0.0	0.0	0.3	38.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	88.7	0.0	0.0	0.0	0.0	402.4	0.0
%ile BackOfQ(50%),veh/ln	1.3	2.9	2.7	1.6	0.0	25.6	6.1	2.1	0.0	0.1	56.3	11.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.0	30.6	30.9	47.0	0.0	134.5	38.1	31.7	0.0	31.8	443.5	79.1
LnGrp LOS	D	C	C	D	A	F	D	C		C	F	E
Approach Vol, veh/h		327			453			721	A		525	
Approach Delay, s/veh		33.4			122.5			36.3			218.1	
Approach LOS		C			F			D			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.4	29.0		35.3	11.9	29.5		28.3
Change Period (Y+Rc), s	4.0	4.6		4.6	4.0	4.6		4.9
Max Green Setting (Gmax), s	11.1	29.0		23.4	11.1	29.0		23.4
Max Q Clear Time (g_c+I1), s	5.6	9.8		16.0	5.1	24.2		24.2
Green Ext Time (p_c), s	0.0	1.0		1.5	0.0	0.7		0.0

Intersection Summary	
HCM 6th Ctrl Delay	102.2
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	169	169	200	760	224	378	101	15	269	158	827	130
Future Volume (veh/h)	169	169	200	760	224	378	101	15	269	158	827	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1811	1811	1678	1678	1678	1856	1856	1856
Adj Flow Rate, veh/h	199	148	0	800	236	0	106	16	0	166	871	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	6	6	6	6	6	6	15	15	15	3	3	3
Cap, veh/h	381	200		878	461		142	821		387	1393	
Arrive On Green	0.11	0.11	0.00	0.25	0.25	0.00	0.09	0.26	0.00	0.22	0.40	0.00
Sat Flow, veh/h	3450	1811	1535	3450	1811	1535	1598	3272	0	1767	3526	1572
Grp Volume(v), veh/h	199	148	0	800	236	0	106	16	0	166	871	0
Grp Sat Flow(s),veh/h/ln	1725	1811	1535	1725	1811	1535	1598	1594	0	1767	1763	1572
Q Serve(g_s), s	6.5	9.5	0.0	27.0	13.4	0.0	7.8	0.4	0.0	9.7	23.8	0.0
Cycle Q Clear(g_c), s	6.5	9.5	0.0	27.0	13.4	0.0	7.8	0.4	0.0	9.7	23.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	381	200		878	461		142	821		387	1393	
V/C Ratio(X)	0.52	0.74		0.91	0.51		0.75	0.02		0.43	0.63	
Avail Cap(c_a), veh/h	635	334		914	480		160	821		387	1393	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.47	0.47	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	50.4	51.7	0.0	43.4	38.3	0.0	53.3	33.2	0.0	40.4	29.1	0.0
Incr Delay (d2), s/veh	0.4	2.0	0.0	6.8	0.4	0.0	12.7	0.0	0.0	0.3	2.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	4.4	0.0	12.4	6.1	0.0	3.6	0.2	0.0	4.2	10.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.8	53.7	0.0	50.2	38.8	0.0	66.0	33.3	0.0	40.6	31.3	0.0
LnGrp LOS	D	D		D	D		E	C		D	C	
Approach Vol, veh/h		347	A		1036	A		122	A		1037	A
Approach Delay, s/veh		52.1			47.6			61.7			32.8	
Approach LOS		D			D			E			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	14.7	52.3		17.8	31.2	35.8		35.1
Change Period (Y+Rc), s	4.0	4.9		4.6	4.9	* 4.9		4.6
Max Green Setting (Gmax), s	12.0	36.0		22.1	17.1	* 31		31.8
Max Q Clear Time (g_c+I1), s	9.8	25.8		11.5	11.7	2.4		29.0
Green Ext Time (p_c), s	0.0	4.6		0.8	0.1	0.0		1.5

Intersection Summary	
HCM 6th Ctrl Delay	42.8
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	203	0	20	4	0	27	3	887	3	31	151	9
Future Volume (veh/h)	203	0	20	4	0	27	3	887	3	31	151	9
Initial Q (Qb), veh	0	0	0	0	0	0	0	44	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1841	1841	1841	1796	1796	1796
Adj Flow Rate, veh/h	231	0	3	5	0	4	3	1008	3	35	172	5
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	4	4	4	7	7	7
Cap, veh/h	359	0	387	96	19	38	6	2074	5	46	2042	59
Arrive On Green	0.24	0.00	0.24	0.24	0.00	0.24	0.00	0.58	0.58	0.03	0.60	0.60
Sat Flow, veh/h	1120	0	1594	119	77	157	1753	3577	11	1711	3385	98
Grp Volume(v), veh/h	231	0	3	9	0	0	3	493	518	35	86	91
Grp Sat Flow(s),veh/h/ln	1120	0	1594	353	0	0	1753	1749	1839	1711	1706	1777
Q Serve(g_s), s	0.0	0.0	0.1	0.1	0.0	0.0	0.1	13.7	13.7	1.7	1.8	1.8
Cycle Q Clear(g_c), s	17.3	0.0	0.1	17.4	0.0	0.0	0.1	13.7	13.7	1.7	1.8	1.8
Prop In Lane	1.00		1.00	0.56		0.44	1.00		0.01	1.00		0.06
Lane Grp Cap(c), veh/h	359	0	387	153	0	0	6	1014	1066	46	1029	1072
V/C Ratio(X)	0.64	0.00	0.01	0.06	0.00	0.00	0.53	0.49	0.49	0.77	0.08	0.08
Avail Cap(c_a), veh/h	426	0	462	223	0	0	508	1014	1066	495	1029	1072
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.3	0.0	23.8	25.4	0.0	0.0	41.3	11.4	11.4	40.1	6.9	6.9
Incr Delay (d2), s/veh	1.4	0.0	0.0	0.1	0.0	0.0	25.8	1.7	1.6	9.5	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.6	6.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	0.0	0.0	0.1	0.0	0.0	0.1	9.0	9.1	0.8	0.6	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.7	0.0	23.8	25.4	0.0	0.0	67.1	19.7	18.9	49.6	7.0	7.0
LnGrp LOS	C	A	C	C	A	A	E	B	B	D	A	A
Approach Vol, veh/h		234			9			1014			212	
Approach Delay, s/veh		31.6			25.4			19.4			14.1	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.2	52.6		24.1	4.3	54.5		24.1				
Change Period (Y+Rc), s	4.0	4.5		4.0	4.0	4.5		4.0				
Max Green Setting (Gmax), s	24.0	30.0		24.0	24.0	50.0		24.0				
Max Q Clear Time (g_c+I1), s	3.7	15.7		19.3	2.1	3.8		19.4				
Green Ext Time (p_c), s	0.0	3.9		0.3	0.0	0.7		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			20.6									
HCM 6th LOS			C									
Notes												

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary
16: Dubuque Ave./101 NB On Ramp & Oyster Point Blvd. 01/27/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	245	209	295	808	662	986	490	153	173	0	0	0
Future Volume (veh/h)	245	209	295	808	662	986	490	153	173	0	0	0
Initial Q (Qb), veh	0	0	0	32	16	0	10	0	5			
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1841	1841	1841	1870	1870	1870	1826	1826	1826			
Adj Flow Rate, veh/h	258	220	80	851	697	642	516	161	182			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	4	4	4	2	2	2	5	5	5			
Cap, veh/h	387	1062	434	1048	868	1328	741	441	1377			
Arrive On Green	0.11	0.31	0.31	0.29	0.49	0.49	0.21	0.21	0.21			
Sat Flow, veh/h	3506	3681	1508	3456	1870	2790	3374	1826	2723			
Grp Volume(v), veh/h	258	220	80	851	697	642	516	161	182			
Grp Sat Flow(s),veh/h/ln	1753	1841	1508	1728	1870	1395	1687	1826	1362			
Q Serve(g_s), s	4.8	3.0	2.6	15.7	20.5	10.3	9.7	5.2	2.4			
Cycle Q Clear(g_c), s	4.8	3.0	2.6	15.7	20.5	10.3	9.7	5.2	2.4			
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	387	1062	434	1048	868	1328	741	441	1377			
V/C Ratio(X)	0.67	0.21	0.18	0.81	0.80	0.48	0.70	0.37	0.13			
Avail Cap(c_a), veh/h	1496	2059	843	1373	1046	1560	1340	726	1877			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	31.4	20.0	19.9	26.6	19.3	13.3	25.3	22.9	9.1			
Incr Delay (d2), s/veh	1.5	0.1	0.3	2.2	4.3	0.4	0.4	0.2	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	35.8	12.4	0.0	4.3	0.0	0.1			
%ile BackOfQ(50%),veh/ln	2.2	1.4	1.0	14.3	15.9	3.4	4.7	2.3	2.6			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.9	20.2	20.2	64.6	36.0	13.6	30.0	23.1	9.2			
LnGrp LOS	C	C	C	E	D	B	C	C	A			
Approach Vol, veh/h		558			2190			859				
Approach Delay, s/veh		26.0			40.6			24.3				
Approach LOS		C			D			C				
Timer - Assigned Phs	1	2		4	5	6						
Phs Duration (G+Y+Rc), s	23.3	26.2		18.4	11.2	38.4						
Change Period (Y+Rc), s	3.5	5.0		4.0	3.5	5.0						
Max Green Setting (Gmax), s	27.0	38.0		27.0	29.0	38.0						
Max Q Clear Time (g_c+I1), s	17.7	5.0		11.7	6.8	22.5						
Green Ext Time (p_c), s	2.1	3.4		2.7	0.9	10.8						

Intersection Summary			
HCM 6th Ctrl Delay			34.4
HCM 6th LOS			C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	121	292	30	5	931	41	99	1	18	27	0	274
Future Volume (veh/h)	121	292	30	5	931	41	99	1	18	27	0	274
Initial Q (Qb), veh	0	32	0	0	140	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1678	1678	1678	1870	1870	1870	1841	1841	1841	1870	1870	1870
Adj Flow Rate, veh/h	133	321	30	5	1023	43	109	1	0	30	0	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	15	15	15	2	2	2	4	4	4	2	2	2
Cap, veh/h	176	2172	189	11	2410	73	195	204	0	53	0	82
Arrive On Green	0.06	0.73	0.73	0.01	0.68	0.68	0.11	0.11	0.00	0.03	0.00	0.00
Sat Flow, veh/h	3100	2937	272	1781	3473	146	1753	1841	0	1781	0	2790
Grp Volume(v), veh/h	133	173	178	5	523	543	109	1	0	30	0	0
Grp Sat Flow(s),veh/h/ln	1550	1594	1615	1781	1777	1842	1753	1841	0	1781	0	1395
Q Serve(g_s), s	5.9	4.5	4.6	0.4	18.5	18.5	8.3	0.1	0.0	2.3	0.0	0.0
Cycle Q Clear(g_c), s	5.9	4.5	4.6	0.4	18.5	18.5	8.3	0.1	0.0	2.3	0.0	0.0
Prop In Lane	1.00		0.17	1.00		0.08	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	176	1171	1189	11	1216	1265	195	204	0	53	0	82
V/C Ratio(X)	0.76	0.15	0.15	0.44	0.43	0.43	0.56	0.00	0.00	0.57	0.00	0.00
Avail Cap(c_a), veh/h	221	1171	1187	102	1216	1260	388	408	0	140	0	219
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.99	0.99	0.99	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	65.1	6.4	6.3	69.3	14.8	14.6	59.0	55.3	0.0	67.1	0.0	0.0
Incr Delay (d2), s/veh	7.8	0.3	0.3	9.9	1.1	1.1	0.9	0.0	0.0	3.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	1.6	1.5	0.0	41.9	38.6	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	3.9	4.0	0.2	32.9	32.5	3.8	0.0	0.0	1.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.9	8.2	8.1	79.2	57.9	54.2	59.9	55.3	0.0	70.6	0.0	0.0
LnGrp LOS	E	A	A	E	E	D	E	E	A	E	A	A
Approach Vol, veh/h		484			1071			110			30	
Approach Delay, s/veh		26.0			56.1			59.9			70.6	
Approach LOS		C			E			E			E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.9	100.4		19.6	4.9	107.4		8.1				
Change Period (Y+Rc), s	4.0	4.6		4.0	4.0	4.6		4.0				
Max Green Setting (Gmax), s	10.0	71.4		31.0	8.0	73.4		11.0				
Max Q Clear Time (g_c+I1), s	7.9	20.5		10.3	2.4	6.6		4.3				
Green Ext Time (p_c), s	0.1	8.2		0.2	0.0	2.1		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			48.0									
HCM 6th LOS			D									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	357	28	196	879	77	68	285	212	180	468	521
Future Volume (veh/h)	118	357	28	196	879	77	68	285	212	180	468	521
Initial Q (Qb), veh	0	0	0	0	10	0	0	0	32	0	36	18
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1885	1885	1885	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	120	364	23	200	897	75	69	291	216	184	478	224
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	1	1	1	2	2	2	2	2	2
Cap, veh/h	150	1739	109	389	1284	100	114	365	851	574	1088	468
Arrive On Green	0.08	0.35	0.35	0.11	0.38	0.38	0.06	0.18	0.18	0.18	0.31	0.31
Sat Flow, veh/h	1781	4906	306	3483	3340	279	1781	1870	2790	3456	3554	1529
Grp Volume(v), veh/h	120	251	136	200	481	491	69	291	216	184	478	224
Grp Sat Flow(s),veh/h/ln	1781	1702	1808	1742	1791	1828	1781	1870	1395	1728	1777	1529
Q Serve(g_s), s	7.3	5.7	5.8	6.0	25.0	25.0	4.1	16.6	0.0	5.1	11.9	10.0
Cycle Q Clear(g_c), s	7.3	5.7	5.8	6.0	25.0	25.0	4.1	16.6	0.0	5.1	11.9	10.0
Prop In Lane	1.00		0.17	1.00		0.15	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	150	1207	641	389	684	699	114	365	851	574	1088	468
V/C Ratio(X)	0.80	0.21	0.21	0.51	0.70	0.70	0.61	0.80	0.25	0.32	0.44	0.48
Avail Cap(c_a), veh/h	162	1207	641	412	684	698	130	493	1047	624	1088	468
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.61	0.61	0.61	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.4	24.7	24.8	46.0	29.3	29.2	50.1	42.3	30.6	40.5	32.4	19.1
Incr Delay (d2), s/veh	20.2	0.4	0.8	0.2	3.7	3.6	3.4	16.5	0.7	0.1	1.3	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	1.3	1.2	0.0	0.0	13.6	0.0	14.1	20.4
%ile BackOfQ(50%),veh/ln	4.1	2.4	2.6	2.5	11.8	12.0	1.9	9.0	5.0	2.2	9.5	8.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.6	25.1	25.5	46.3	34.3	34.0	53.5	58.8	44.9	40.6	47.7	43.0
LnGrp LOS	E	C	C	D	C	C	D	E	D	D	D	D
Approach Vol, veh/h		507			1172			576			886	
Approach Delay, s/veh		35.8			36.2			52.9			45.1	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	38.7	13.3	47.0	24.9	24.9	16.3	44.0
Change Period (Y+Rc), s	4.0	5.0	4.0	5.0	5.0	* 5	4.0	5.0
Max Green Setting (Gmax), s	8.0	32.0	10.0	42.0	11.0	* 29	13.0	39.0
Max Q Clear Time (g_c+I1), s	6.1	13.9	9.3	27.0	7.1	18.6	8.0	7.8
Green Ext Time (p_c), s	0.0	2.5	0.0	3.2	0.2	1.2	0.2	1.7

Intersection Summary	
HCM 6th Ctrl Delay	41.7
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	563	2	50	2	0	2	63	251	3	0	122	981
Future Volume (veh/h)	563	2	50	2	0	2	63	251	3	0	122	981
Initial Q (Qb), veh	0	0	0	0	0	0	12	12	0	0	0	24
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.95	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1900	1900	1900	1841	1841	1841	0	1856	1856
Adj Flow Rate, veh/h	594	0	19	2	0	0	66	264	2	0	128	674
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	0	0	0	4	4	4	0	3	3
Cap, veh/h	903	0	402	5	0	0	140	862	6	0	586	1587
Arrive On Green	0.26	0.00	0.26	0.00	0.00	0.00	0.05	0.45	0.45	0.00	0.31	0.31
Sat Flow, veh/h	3506	0	1560	1809	0	0	1753	1824	14	0	1856	2768
Grp Volume(v), veh/h	594	0	19	2	0	0	66	0	266	0	128	674
Grp Sat Flow(s),veh/h/ln	1753	0	1560	1810	0	0	1753	0	1837	0	1856	1384
Q Serve(g_s), s	5.0	0.0	0.3	0.0	0.0	0.0	1.2	0.0	3.1	0.0	1.7	4.6
Cycle Q Clear(g_c), s	5.0	0.0	0.3	0.0	0.0	0.0	1.2	0.0	3.1	0.0	1.7	4.6
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.01	0.00		1.00
Lane Grp Cap(c), veh/h	903	0	402	5	0	0	140	0	849	0	586	1587
V/C Ratio(X)	0.66	0.00	0.05	0.38	0.00	0.00	0.47	0.00	0.31	0.00	0.22	0.42
Avail Cap(c_a), veh/h	3146	0	1400	1083	0	0	1049	0	3188	0	1943	3625
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	12.9	0.0	10.9	19.1	0.0	0.0	17.9	0.0	6.3	0.0	9.3	4.9
Incr Delay (d2), s/veh	0.3	0.0	0.0	39.5	0.0	0.0	2.5	0.0	0.2	0.0	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	100.2	0.0	2.1	0.0	0.0	2.9
%ile BackOfQ(50%),veh/ln	1.9	0.0	0.1	0.1	0.0	0.0	5.5	0.0	2.1	0.0	0.6	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.2	0.0	10.9	58.5	0.0	0.0	120.5	0.0	8.5	0.0	9.5	8.0
LnGrp LOS	B	A	B	E	A	A	F	A	A	A	A	A
Approach Vol, veh/h		613			2			332			802	
Approach Delay, s/veh		13.2			58.5			30.8			8.2	
Approach LOS		B			E			C			A	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	4.8	13.7		3.1		18.6		11.8				
Change Period (Y+Rc), s	3.0	3.5		3.0		3.5		3.0				
Max Green Setting (Gmax), s	20.0	35.0		20.0		58.0		30.0				
Max Q Clear Time (g_c+I1), s	3.2	6.6		2.0		5.1		7.0				
Green Ext Time (p_c), s	0.1	3.6		0.0		0.8		1.8				

Intersection Summary			
HCM 6th Ctrl Delay			14.3
HCM 6th LOS			B

Notes
User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	152	50	85	638	233	232	59	455	120	108	447	102
Future Volume (vph)	152	50	85	638	233	232	59	455	120	108	447	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
Lane Util. Factor		0.95		0.97	1.00	1.00	1.00	0.95	1.00	0.91	0.91	1.00
Frpb, ped/bikes		0.97		1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	0.96
Flpb, ped/bikes		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		2893		3060	1660	1387	1547	3094	1384	1408	2961	1333
Flt Permitted		0.97		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		2893		3060	1660	1387	1547	3094	1384	1408	2961	1333
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	157	52	88	658	240	239	61	469	124	111	461	105
RTOR Reduction (vph)	0	41	0	0	0	175	0	0	0	0	0	81
Lane Group Flow (vph)	0	256	0	658	240	64	61	469	124	100	472	24
Confl. Peds. (#/hr)			74									5
Confl. Bikes (#/hr)			2			6			4			
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	5%	5%	5%	5%	5%	5%
Turn Type	Split	NA		Split	NA	Perm	Split	NA	custom	Split	NA	Perm
Protected Phases	4	4		7	7		6	6	2 6 7!	2!	2	
Permitted Phases						7						2
Actuated Green, G (s)		20.5		32.2	32.2	32.2	21.0	21.0	90.6	27.6	27.6	27.6
Effective Green, g (s)		20.5		32.2	32.2	32.2	21.0	21.0	90.6	27.6	27.6	27.6
Actuated g/C Ratio		0.17		0.27	0.27	0.27	0.18	0.18	0.75	0.23	0.23	0.23
Clearance Time (s)		4.0		4.9	4.9	4.9	4.9	4.9		4.9	4.9	4.9
Vehicle Extension (s)		3.0		3.0	3.0	3.0	2.5	2.5		2.0	2.0	2.0
Lane Grp Cap (vph)		494		821	445	372	270	541	1044	323	681	306
v/s Ratio Prot		c0.09		c0.22	0.14		0.04	c0.15	0.09	0.07	c0.16	
v/s Ratio Perm						0.05						0.02
v/c Ratio		0.52		0.80	0.54	0.17	0.23	0.87	0.12	0.31	0.69	0.08
Uniform Delay, d1		45.2		40.9	37.6	33.7	42.5	48.1	4.0	38.3	42.3	36.2
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.9		5.7	1.3	0.2	0.3	13.6	0.0	2.5	5.7	0.5
Delay (s)		46.2		46.6	38.8	33.9	42.8	61.7	4.0	40.8	48.1	36.7
Level of Service		D		D	D	C	D	E	A	D	D	D
Approach Delay (s)		46.2			42.3			49.0			45.2	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	45.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.7
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	66	212	1498	116	30	60
Future Volume (vph)	66	212	1498	116	30	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9	4.9		4.2	4.2
Lane Util. Factor	1.00	0.91	0.91		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1687	4848	2700		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1687	4848	5022		1770	1583
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	67	216	1529	118	31	61
RTOR Reduction (vph)	0	0	5	0	0	55
Lane Group Flow (vph)	67	216	1642	0	31	6
Confl. Peds. (#/hr)				1		
Confl. Bikes (#/hr)				6		
Heavy Vehicles (%)	7%	7%	2%	2%	2%	2%
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	5	2	6		3	
Permitted Phases						3
Actuated Green, G (s)	8.0	70.9	58.9		9.6	9.6
Effective Green, g (s)	8.0	70.9	58.9		9.6	9.6
Actuated g/C Ratio	0.08	0.71	0.59		0.10	0.10
Clearance Time (s)	4.0	4.9	4.9		4.2	4.2
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	134	3437	1590		169	151
v/s Ratio Prot	c0.04	0.04	c0.61		c0.02	
v/s Ratio Perm						0.00
v/c Ratio	0.50	0.06	1.03		0.18	0.04
Uniform Delay, d1	44.1	4.4	20.6		41.6	41.0
Progression Factor	1.00	1.00	0.79		1.00	1.00
Incremental Delay, d2	1.1	0.0	30.8		0.2	0.0
Delay (s)	45.2	4.5	47.1		41.8	41.1
Level of Service	D	A	D		D	D
Approach Delay (s)		14.1	47.1		41.3	
Approach LOS		B	D		D	

Intersection Summary			
HCM 2000 Control Delay	42.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.1
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBU	EBL	EBT	EBR	WBL2	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	4	49	266	63	30	1255	19	2	766	32	49	8
Future Volume (vph)	4	49	266	63	30	1255	19	2	766	32	49	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.6		4.0	4.6			4.0	4.0	4.0	
Lane Util. Factor		1.00	0.91		1.00	0.91			0.91	0.91	1.00	
Frpb, ped/bikes		1.00	1.00		1.00	1.00			1.00	1.00	0.94	
Flpb, ped/bikes		1.00	1.00		1.00	1.00			1.00	1.00	1.00	
Frt		1.00	0.97		1.00	1.00			1.00	1.00	0.85	
Flt Protected		0.95	1.00		0.95	1.00			0.95	0.96	1.00	
Satd. Flow (prot)		1597	4446		1770	5070			3189	1608	1480	
Flt Permitted		0.28	1.00		0.95	1.00			0.95	0.96	1.00	
Satd. Flow (perm)		467	4446		1770	5070			3189	1608	1480	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	4	51	277	66	31	1307	20	2	798	33	51	8
RTOR Reduction (vph)	0	0	0	0	0	1	0	0	0	0	40	0
Lane Group Flow (vph)	0	55	343	0	31	1326	0	0	553	280	11	0
Confl. Peds. (#/hr)							8				37	
Confl. Bikes (#/hr)				2			5				4	
Heavy Vehicles (%)	13%	13%	13%	13%	2%	2%	2%	3%	3%	3%	3%	1%
Turn Type	custom	Prot	NA		Prot	NA		Split	Split	NA	Perm	Split
Protected Phases		1	6		5	2		4	4	4		7
Permitted Phases	1										4	
Actuated Green, G (s)		14.4	48.2		4.4	38.2			28.4	28.4	28.4	
Effective Green, g (s)		14.4	48.2		4.4	38.2			28.4	28.4	28.4	
Actuated g/C Ratio		0.11	0.37		0.03	0.30			0.22	0.22	0.22	
Clearance Time (s)		4.0	4.6		4.0	4.6			4.0	4.0	4.0	
Vehicle Extension (s)		2.0	3.0		2.0	3.0			2.0	2.0	2.0	
Lane Grp Cap (vph)		51	1656		60	1496			699	352	324	
v/s Ratio Prot			0.08		0.02	c0.26			0.17	c0.17		
v/s Ratio Perm		c0.12									0.01	
v/c Ratio		1.08	0.21		0.52	0.89			0.79	0.80	0.03	
Uniform Delay, d1		57.5	27.6		61.5	43.5			47.7	47.8	39.7	
Progression Factor		1.00	1.00		1.00	1.00			1.00	1.00	1.00	
Incremental Delay, d2		149.7	0.1		3.1	6.7			5.7	11.0	0.0	
Delay (s)		207.2	27.7		64.6	50.2			53.4	58.8	39.7	
Level of Service		F	C		E	D			D	E	D	
Approach Delay (s)			52.5			50.6				54.3		
Approach LOS			D			D				D		

Intersection Summary			
HCM 2000 Control Delay	53.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	129.4	Sum of lost time (s)	21.1
Intersection Capacity Utilization	96.8%	ICU Level of Service	F
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	SBT	SBR2	NER	NER2
Lane Configurations				
Traffic Volume (vph)	27	431	120	57
Future Volume (vph)	27	431	120	57
Ideal Flow (vphpl)	1900	1900	1990	1900
Total Lost time (s)	4.0		4.5	4.5
Lane Util. Factor	0.95		*0.95	1.00
Frpb, ped/bikes	0.97		1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00
Frt	0.86		1.00	0.85
Flt Protected	1.00		1.00	1.00
Satd. Flow (prot)	2969		3376	1442
Flt Permitted	1.00		1.00	1.00
Satd. Flow (perm)	2969		3376	1442
Peak-hour factor, PHF	0.96	0.96	0.96	0.96
Adj. Flow (vph)	28	449	125	59
RTOR Reduction (vph)	373	0	0	0
Lane Group Flow (vph)	112	0	125	59
Confl. Peds. (#/hr)				54
Confl. Bikes (#/hr)		8		
Heavy Vehicles (%)	1%	1%	12%	12%
Turn Type	NA		Prot	Prot
Protected Phases	7		3	3
Permitted Phases				
Actuated Green, G (s)	9.1		18.2	18.2
Effective Green, g (s)	9.1		18.2	18.2
Actuated g/C Ratio	0.07		0.14	0.14
Clearance Time (s)	4.0		4.5	4.5
Vehicle Extension (s)	2.0		2.0	2.0
Lane Grp Cap (vph)	208		474	202
v/s Ratio Prot	c0.04		0.04	c0.04
v/s Ratio Perm				
v/c Ratio	0.93dr		0.26	0.29
Uniform Delay, d1	58.1		49.6	49.8
Progression Factor	1.00		1.00	1.00
Incremental Delay, d2	1.3		0.1	0.3
Delay (s)	59.5		49.7	50.1
Level of Service	E		D	D
Approach Delay (s)	59.5			
Approach LOS	E			

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	105	1	0	682	48	3	1	0	17	0	268
Future Volume (vph)	68	105	1	0	682	48	3	1	0	17	0	268
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0			4.0	4.0
Lane Util. Factor	1.00	0.95			0.95			1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	1.00
Frt	1.00	1.00			0.99			1.00			1.00	0.85
Flt Protected	0.95	1.00			1.00			0.96			0.95	1.00
Satd. Flow (prot)	1492	2979			3273			1831			1719	1538
Flt Permitted	0.95	1.00			1.00			0.66			0.76	1.00
Satd. Flow (perm)	1492	2979			3273			1252			1366	1538
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	73	113	1	0	733	52	3	1	0	18	0	288
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	0	0	0	258
Lane Group Flow (vph)	73	113	0	0	785	0	0	4	0	0	18	30
Confl. Peds. (#/hr)			1			2						
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	21%	21%	21%	9%	9%	9%	0%	0%	0%	5%	5%	5%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			3			4	
Permitted Phases							3			4		4
Actuated Green, G (s)	7.2	35.7			24.5			19.9			7.8	7.8
Effective Green, g (s)	7.2	35.7			24.5			19.9			7.8	7.8
Actuated g/C Ratio	0.10	0.47			0.32			0.26			0.10	0.10
Clearance Time (s)	4.0	4.0			4.0			4.0			4.0	4.0
Vehicle Extension (s)	2.0	2.5			2.5			2.0			2.0	2.0
Lane Grp Cap (vph)	142	1410			1063			330			141	159
v/s Ratio Prot	c0.05	0.04			c0.24							
v/s Ratio Perm								c0.00			0.01	c0.02
v/c Ratio	0.51	0.08			0.74			0.01			0.13	0.19
Uniform Delay, d1	32.4	10.9			22.6			20.5			30.7	30.9
Progression Factor	1.00	1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2	1.3	0.0			2.6			0.1			0.1	0.2
Delay (s)	33.7	10.9			25.2			20.6			30.9	31.1
Level of Service	C	B			C			C			C	C
Approach Delay (s)		19.8			25.2			20.6			31.1	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	25.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	75.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	50.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Intersection Delay, s/veh	12.4
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	324	114	194	76	1	57	16	135	0	2	0
Future Vol, veh/h	5	324	114	194	76	1	57	16	135	0	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles, %	4	4	4	10	10	10	16	16	16	50	50	50
Mvmt Flow	5	345	121	206	81	1	61	17	144	0	2	0
Number of Lanes	0	1	1	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	13.5	12	10.8	10.9
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	78%	0%	2%	0%	100%	0%	0%
Vol Thru, %	22%	0%	98%	0%	0%	99%	100%
Vol Right, %	0%	100%	0%	100%	0%	1%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	73	135	329	114	194	77	2
LT Vol	57	0	5	0	194	0	0
Through Vol	16	0	324	0	0	76	2
RT Vol	0	135	0	114	0	1	0
Lane Flow Rate	78	144	350	121	206	82	2
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.154	0.24	0.553	0.167	0.37	0.135	0.005
Departure Headway (Hd)	7.119	6.015	5.686	4.971	6.456	5.941	7.802
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	505	597	637	723	557	605	459
Service Time	4.853	3.748	3.412	2.697	4.186	3.67	5.849
HCM Lane V/C Ratio	0.154	0.241	0.549	0.167	0.37	0.136	0.004
HCM Control Delay	11.2	10.6	15.2	8.7	12.9	9.6	10.9
HCM Lane LOS	B	B	C	A	B	A	B
HCM 95th-tile Q	0.5	0.9	3.4	0.6	1.7	0.5	0

HCM 6th Signalized Intersection Summary
1: Gateway & Gatewa Business Pkwy/Larkspur Landing Dwy

02/11/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	0	43	14	0	24	42	356	3	18	415	95
Future Volume (veh/h)	34	0	43	14	0	24	42	356	3	18	415	95
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.96		0.95	0.96		0.95	1.00		0.96	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1781	1781	1781	1796	1796	1796	1767	1767	1767
Adj Flow Rate, veh/h	35	0	5	14	0	2	43	367	3	19	428	83
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	5	8	8	8	7	7	7	9	9	9
Cap, veh/h	261	0	186	254	0	182	108	2276	19	59	1750	336
Arrive On Green	0.13	0.00	0.13	0.13	0.00	0.13	0.06	0.66	0.66	0.03	0.63	0.63
Sat Flow, veh/h	1319	0	1477	1284	0	1441	1711	3468	28	1682	2786	535
Grp Volume(v), veh/h	35	0	5	14	0	2	43	180	190	19	256	255
Grp Sat Flow(s),veh/h/ln	1319	0	1477	1284	0	1441	1711	1706	1790	1682	1678	1642
Q Serve(g_s), s	1.8	0.0	0.2	0.7	0.0	0.1	1.8	3.0	3.1	0.8	5.0	5.1
Cycle Q Clear(g_c), s	1.9	0.0	0.2	0.9	0.0	0.1	1.8	3.0	3.1	0.8	5.0	5.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.02	1.00		0.33
Lane Grp Cap(c), veh/h	261	0	186	254	0	182	108	1120	1175	59	1054	1031
V/C Ratio(X)	0.13	0.00	0.03	0.06	0.00	0.01	0.40	0.16	0.16	0.32	0.24	0.25
Avail Cap(c_a), veh/h	620	0	589	604	0	575	237	1120	1175	233	1054	1031
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.96	0.96	0.96
Uniform Delay (d), s/veh	29.5	0.0	28.7	29.1	0.0	28.7	33.8	5.0	5.0	35.3	6.1	6.1
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.0	0.0	0.0	0.9	0.3	0.3	1.1	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.1	0.2	0.0	0.0	0.8	1.0	1.0	0.3	1.6	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.6	0.0	28.8	29.2	0.0	28.7	34.6	5.3	5.2	36.5	6.6	6.7
LnGrp LOS	C	A	C	C	A	C	C	A	A	D	A	A
Approach Vol, veh/h		40			16			413			530	
Approach Delay, s/veh		29.5			29.1			8.3			7.7	
Approach LOS		C			C			A			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.6	54.3		14.1	8.7	52.2		14.1
Change Period (Y+Rc), s	4.0	5.1		4.6	4.0	5.1		4.6
Max Green Setting (Gmax), s	10.4	21.0		29.9	10.4	21.0		29.9
Max Q Clear Time (g_c+I1), s	2.8	5.1		3.9	3.8	7.1		2.9
Green Ext Time (p_c), s	0.0	1.2		0.0	0.0	1.8		0.0

Intersection Summary	
HCM 6th Ctrl Delay	9.2
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	842	54	12	427	131	639
Future Volume (veh/h)	842	54	12	427	131	639
Initial Q (Qb), veh	45	0	0	0	10	51
Ped-Bike Adj(A_pbT)		0.96	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1707	1707	1811	1811
Adj Flow Rate, veh/h	915	52	13	464	142	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	13	13	6	6
Cap, veh/h	3604	193	30	3719	214	
Arrive On Green	0.51	0.51	0.02	0.82	0.10	0.00
Sat Flow, veh/h	5017	275	1626	4815	1725	2701
Grp Volume(v), veh/h	631	336	13	464	142	0
Grp Sat Flow(s),veh/h/ln	1675	1776	1626	1554	1725	1351
Q Serve(g_s), s	10.6	10.6	0.8	2.0	8.0	0.0
Cycle Q Clear(g_c), s	10.6	10.6	0.8	2.0	8.0	0.0
Prop In Lane		0.15	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2479	1320	30	3719	214	
V/C Ratio(X)	0.25	0.25	0.44	0.12	0.66	
Avail Cap(c_a), veh/h	2542	1348	130	3808	517	
HCM Platoon Ratio	0.67	0.67	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.98	0.98	0.99	0.99	1.00	0.00
Uniform Delay (d), s/veh	10.7	10.5	48.6	2.5	42.9	0.0
Incr Delay (d2), s/veh	0.2	0.5	3.7	0.1	3.5	0.0
Initial Q Delay(d3),s/veh	1.4	1.2	0.0	0.0	46.7	0.0
%ile BackOfQ(50%),veh/ln	6.4	6.7	0.4	0.5	7.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.4	12.2	52.3	2.5	93.1	0.0
LnGrp LOS	B	B	D	A	F	
Approach Vol, veh/h	967			477	142	A
Approach Delay, s/veh	12.3			3.9	93.1	
Approach LOS	B			A	F	

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.8	79.9				85.7		14.3
Change Period (Y+Rc), s	4.0	4.0				4.0		4.0
Max Green Setting (Gmax), s	8.0	50.0				62.0		30.0
Max Q Clear Time (g_c+I1), s	2.8	12.6				4.0		10.0
Green Ext Time (p_c), s	0.0	4.6				2.2		0.5

Intersection Summary			
HCM 6th Ctrl Delay			17.0
HCM 6th LOS			B

Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	164	1247	70	113	295	104	42	162	304	192	131	102
Future Volume (veh/h)	164	1247	70	113	295	104	42	162	304	192	131	102
Initial Q (Qb), veh	5	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	969	1841	1633	1633	1633	1752	1752	1752	1767	1767	1767
Adj Flow Rate, veh/h	173	1313	71	119	311	76	44	171	0	202	138	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	18	18	18	10	10	10	9	9	9
Cap, veh/h	211	1479	80	138	1961	457	131	273		225	461	
Arrive On Green	0.11	0.58	0.58	0.09	0.55	0.55	0.08	0.08	0.00	0.13	0.14	0.00
Sat Flow, veh/h	1753	2564	139	1555	3597	838	1668	3416	0	1682	3445	0
Grp Volume(v), veh/h	173	903	481	119	254	133	44	171	0	202	138	0
Grp Sat Flow(s),veh/h/ln	1753	882	939	1555	1486	1462	1668	1664	0	1682	1678	0
Q Serve(g_s), s	14.6	66.6	66.6	11.3	6.3	6.7	3.7	7.5	0.0	17.7	5.5	0.0
Cycle Q Clear(g_c), s	14.6	66.6	66.6	11.3	6.3	6.7	3.7	7.5	0.0	17.7	5.5	0.0
Prop In Lane	1.00		0.15	1.00		0.57	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	211	1017	542	138	1621	797	131	273		225	461	
V/C Ratio(X)	0.82	0.89	0.89	0.86	0.16	0.17	0.34	0.63		0.90	0.30	
Avail Cap(c_a), veh/h	270	1017	542	170	1647	810	157	710		371	1141	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.85	0.85	0.85	0.96	0.96	0.96	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	65.2	27.5	27.5	67.5	17.0	17.1	65.4	66.6	0.0	64.0	58.2	0.0
Incr Delay (d2), s/veh	9.9	9.9	16.8	25.2	0.2	0.4	0.6	0.9	0.0	9.4	0.1	0.0
Initial Q Delay(d3),s/veh	22.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.2	15.0	17.1	5.5	2.3	2.4	1.6	3.2	0.0	8.2	2.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	97.5	37.4	44.3	92.6	17.2	17.5	66.0	67.5	0.0	73.4	58.4	0.0
LnGrp LOS	F	D	D	F	B	B	E	E		E	E	
Approach Vol, veh/h		1557			506			215	A		340	A
Approach Delay, s/veh		46.2			35.0			67.2			67.3	
Approach LOS		D			D			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.3	91.5	15.8	25.5	20.8	88.0	24.1	17.2
Change Period (Y+Rc), s	4.0	4.9	4.0	* 4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	16.4	50.7	14.1	* 51	23.1	44.0	33.1	32.0
Max Q Clear Time (g_c+I1), s	13.3	68.6	5.7	7.5	16.6	8.7	19.7	9.5
Green Ext Time (p_c), s	0.1	0.0	0.0	0.5	0.2	1.7	0.3	0.6

Intersection Summary	
HCM 6th Ctrl Delay	48.5
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	378	1225	140	34	337	17	79	114	173	104	84	96
Future Volume (veh/h)	378	1225	140	34	337	17	79	114	173	104	84	96
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.89	1.00		0.98	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1618	1618	1618	1752	1752	1752	1663	1663	1663
Adj Flow Rate, veh/h	394	1276	146	35	351	16	82	119	14	108	88	17
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	6	6	6	19	19	19	10	10	10	16	16	16
Cap, veh/h	1510	1867	213	110	643	29	148	156	129	182	192	156
Arrive On Green	0.45	0.60	0.60	0.07	0.22	0.22	0.09	0.09	0.09	0.12	0.12	0.12
Sat Flow, veh/h	3346	3104	353	1541	2977	135	1668	1752	1448	1584	1663	1350
Grp Volume(v), veh/h	394	705	717	35	180	187	82	119	14	108	88	17
Grp Sat Flow(s),veh/h/ln	1673	1721	1737	1541	1537	1575	1668	1752	1448	1584	1663	1350
Q Serve(g_s), s	11.0	41.4	42.1	3.2	15.6	15.8	7.1	10.0	1.3	9.7	7.4	1.7
Cycle Q Clear(g_c), s	11.0	41.4	42.1	3.2	15.6	15.8	7.1	10.0	1.3	9.7	7.4	1.7
Prop In Lane	1.00		0.20	1.00		0.09	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1510	1035	1045	110	332	340	148	156	129	182	192	156
V/C Ratio(X)	0.26	0.68	0.69	0.32	0.54	0.55	0.55	0.76	0.11	0.59	0.46	0.11
Avail Cap(c_a), veh/h	1510	1035	1045	144	332	340	301	316	262	433	455	369
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.09	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.6	20.2	20.3	66.1	52.2	52.3	65.5	66.8	62.9	63.0	62.0	59.5
Incr Delay (d2), s/veh	0.0	0.3	0.3	0.6	6.3	6.2	1.2	2.9	0.1	1.1	0.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	16.2	16.6	1.3	6.7	6.9	3.1	4.6	0.5	4.0	3.2	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.6	20.5	20.6	66.7	58.5	58.5	66.7	69.7	63.0	64.2	62.6	59.6
LnGrp LOS	C	C	C	E	E	E	E	E	E	E	E	E
Approach Vol, veh/h		1816			402			215			213	
Approach Delay, s/veh		21.7			59.2			68.1			63.2	
Approach LOS		C			E			E			E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	72.6	37.3		22.2	14.7	95.1		17.9				
Change Period (Y+Rc), s	4.9	* 4.9		4.9	4.0	4.9		4.6				
Max Green Setting (Gmax), s	31.1	* 32		41.0	14.0	50.0		27.1				
Max Q Clear Time (g_c+I1), s	13.0	17.8		11.7	5.2	44.1		12.0				
Green Ext Time (p_c), s	1.7	1.2		0.6	0.0	4.1		0.5				

Intersection Summary		
HCM 6th Ctrl Delay		34.5
HCM 6th LOS		C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
9: So. Airport Blvd. & Mitchell Ave. & Gateway Blvd.

02/11/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	314	368	29	159	18	330	467	349	22	116	200
Future Volume (veh/h)	96	314	368	29	159	18	330	467	349	22	116	200
Initial Q (Qb), veh	0	13	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		1.00	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1722	1722	1722	1574	1574	1574	1811	1811	1811	1663	1663	1663
Adj Flow Rate, veh/h	103	338	116	31	171	15	355	502	0	24	125	27
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	12	12	12	22	22	22	6	6	6	16	16	16
Cap, veh/h	226	408	339	85	213	19	1439	1480		165	173	139
Arrive On Green	0.04	0.07	0.07	0.06	0.15	0.15	0.45	0.45	0.00	0.10	0.10	0.10
Sat Flow, veh/h	1640	1722	1430	1499	1422	125	3346	3532	0	1584	1663	1338
Grp Volume(v), veh/h	103	338	116	31	0	186	355	502	0	24	125	27
Grp Sat Flow(s),veh/h/ln	1640	1722	1430	1499	0	1546	1673	1721	0	1584	1663	1338
Q Serve(g_s), s	6.5	20.4	8.1	2.1	0.0	12.2	6.9	9.9	0.0	1.4	7.6	1.9
Cycle Q Clear(g_c), s	6.5	20.4	8.1	2.1	0.0	12.2	6.9	9.9	0.0	1.4	7.6	1.9
Prop In Lane	1.00		1.00	1.00		0.08	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	226	408	339	85	0	232	1439	1480		165	173	139
V/C Ratio(X)	0.46	0.83	0.34	0.36	0.00	0.80	0.25	0.34		0.15	0.72	0.19
Avail Cap(c_a), veh/h	201	426	354	144	0	364	1491	1533		353	371	298
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.89	0.89	0.89	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.3	47.9	40.7	47.7	0.0	43.1	19.1	20.0	0.0	42.8	45.6	43.0
Incr Delay (d2), s/veh	0.6	10.9	0.4	1.0	0.0	3.1	0.4	0.6	0.0	0.1	2.1	0.2
Initial Q Delay(d3),s/veh	0.0	42.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	17.0	3.0	0.8	0.0	4.8	2.8	4.1	0.0	0.6	3.2	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.9	101.5	41.1	48.7	0.0	46.2	19.5	20.6	0.0	42.9	47.7	43.2
LnGrp LOS	D	F	D	D	A	D	B	C		D	D	D
Approach Vol, veh/h		557			217			857	A		176	
Approach Delay, s/veh		78.8			46.6			20.1			46.4	
Approach LOS		E			D			C			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.0	27.8		51.4	17.4	20.3		15.8
Change Period (Y+Rc), s	4.0	4.6		4.6	4.6	* 4.6		4.9
Max Green Setting (Gmax), s	10.1	26.0		27.4	11.4	* 25		23.4
Max Q Clear Time (g_c+I1), s	4.1	22.4		11.9	8.5	14.2		9.6
Green Ext Time (p_c), s	0.0	0.7		2.8	0.0	0.4		0.4

Intersection Summary			
HCM 6th Ctrl Delay			44.0
HCM 6th LOS			D

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	122	182	147	320	167	168	160	39	404	202	650	98
Future Volume (veh/h)	122	182	147	320	167	168	160	39	404	202	650	98
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1441	1441	1441	1618	1618	1618	1796	1796	1796	1811	1811	1811
Adj Flow Rate, veh/h	107	222	0	337	176	0	168	41	0	213	684	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	31	31	31	19	19	19	7	7	7	6	6	6
Cap, veh/h	148	311		474	249		198	868		523	1548	
Arrive On Green	0.11	0.11	0.00	0.05	0.05	0.00	0.12	0.25	0.00	0.30	0.45	0.00
Sat Flow, veh/h	1372	2881	1221	3083	1618	1372	1711	3503	0	1725	3441	1535
Grp Volume(v), veh/h	107	222	0	337	176	0	168	41	0	213	684	0
Grp Sat Flow(s),veh/h/ln	1372	1441	1221	1541	1618	1372	1711	1706	0	1725	1721	1535
Q Serve(g_s), s	7.9	7.8	0.0	11.3	11.2	0.0	10.1	1.0	0.0	10.3	14.3	0.0
Cycle Q Clear(g_c), s	7.9	7.8	0.0	11.3	11.2	0.0	10.1	1.0	0.0	10.3	14.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	148	311		474	249		198	868		523	1548	
V/C Ratio(X)	0.72	0.71		0.71	0.71		0.85	0.05		0.41	0.44	
Avail Cap(c_a), veh/h	289	606		611	321		293	868		523	1548	
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.87	0.87	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	45.3	45.3	0.0	47.5	47.5	0.0	45.5	29.6	0.0	29.1	19.8	0.0
Incr Delay (d2), s/veh	2.5	1.1	0.0	2.4	4.3	0.0	9.5	0.0	0.0	0.2	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	2.8	0.0	4.8	5.2	0.0	4.7	0.4	0.0	4.2	5.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.8	46.4	0.0	49.9	51.8	0.0	55.0	29.6	0.0	29.3	20.7	0.0
LnGrp LOS	D	D		D	D		D	C		C	C	
Approach Vol, veh/h		329	A		513	A		209	A		897	A
Approach Delay, s/veh		46.8			50.6			50.0			22.8	
Approach LOS		D			D			D			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	16.2	52.1		15.9	36.7	31.6		20.7
Change Period (Y+Rc), s	4.0	4.9		4.6	4.9	* 4.9		4.6
Max Green Setting (Gmax), s	18.0	26.0		22.1	19.1	* 25		20.8
Max Q Clear Time (g_c+I1), s	12.1	16.3		9.9	12.3	3.0		13.3
Green Ext Time (p_c), s	0.2	3.5		0.9	0.2	0.1		1.7

Intersection Summary	
HCM 6th Ctrl Delay	37.1
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	0	34	3	0	12	41	329	5	18	500	155
Future Volume (veh/h)	61	0	34	3	0	12	41	329	5	18	500	155
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.96		0.96	0.96		1.00	1.00		0.96	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1752	1752	1752	1500	1500	1500	1707	1707	1707	1796	1796	1796
Adj Flow Rate, veh/h	66	0	31	3	0	0	44	354	5	19	538	164
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	10	10	10	27	27	27	13	13	13	7	7	7
Cap, veh/h	298	0	213	215	0	0	53	2190	31	30	1669	506
Arrive On Green	0.15	0.00	0.15	0.15	0.00	0.00	0.03	0.67	0.67	0.02	0.65	0.65
Sat Flow, veh/h	1362	0	1419	805	0	0	1626	3273	46	1711	2552	774
Grp Volume(v), veh/h	66	0	31	3	0	0	44	175	184	19	359	343
Grp Sat Flow(s),veh/h/ln	1362	0	1419	805	0	0	1626	1622	1697	1711	1706	1620
Q Serve(g_s), s	0.0	0.0	1.5	0.2	0.0	0.0	2.1	3.1	3.1	0.8	7.0	7.1
Cycle Q Clear(g_c), s	2.8	0.0	1.5	3.0	0.0	0.0	2.1	3.1	3.1	0.8	7.0	7.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.03	1.00		0.48
Lane Grp Cap(c), veh/h	298	0	213	215	0	0	53	1085	1136	30	1116	1060
V/C Ratio(X)	0.22	0.00	0.15	0.01	0.00	0.00	0.83	0.16	0.16	0.64	0.32	0.32
Avail Cap(c_a), veh/h	508	0	446	390	0	0	511	1085	1136	537	1116	1060
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.8	0.0	28.2	30.1	0.0	0.0	36.8	4.7	4.7	37.3	5.8	5.8
Incr Delay (d2), s/veh	0.1	0.0	0.1	0.0	0.0	0.0	11.7	0.3	0.3	8.2	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.5	0.0	0.0	0.0	1.0	0.9	0.9	0.4	2.3	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.9	0.0	28.4	30.1	0.0	0.0	48.5	5.0	5.0	45.5	6.6	6.6
LnGrp LOS	C	A	C	C	A	A	D	A	A	D	A	A
Approach Vol, veh/h		97			3			403			721	
Approach Delay, s/veh		28.8			30.1			9.8			7.6	
Approach LOS		C			C			A			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.3	55.7		15.5	6.5	54.5		15.5				
Change Period (Y+Rc), s	4.0	4.5		4.0	4.0	4.5		4.0				
Max Green Setting (Gmax), s	24.0	30.0		24.0	24.0	50.0		24.0				
Max Q Clear Time (g_c+I1), s	2.8	5.1		4.8	4.1	9.1		5.0				
Green Ext Time (p_c), s	0.0	1.4		0.2	0.0	3.2		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			10.0									
HCM 6th LOS			B									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	501	1143	558	210	155	270	215	55	787	0	0	0
Future Volume (veh/h)	501	1143	558	210	155	270	215	55	787	0	0	0
Initial Q (Qb), veh	16	8	16	0	0	0	0	0	10			
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	1870	1648	1648	1648	1856	1856	1856			
Adj Flow Rate, veh/h	516	1178	287	216	160	110	222	57	811			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	2	2	2	17	17	17	3	3	3			
Cap, veh/h	717	1652	681	306	557	831	1028	556	1108			
Arrive On Green	0.19	0.44	0.44	0.10	0.35	0.35	0.30	0.30	0.30			
Sat Flow, veh/h	3563	3741	1541	3045	1648	2458	3428	1856	2768			
Grp Volume(v), veh/h	516	1178	287	216	160	110	222	57	811			
Grp Sat Flow(s),veh/h/ln	1781	1870	1541	1522	1648	1229	1714	1856	1384			
Q Serve(g_s), s	10.8	20.1	10.0	5.4	5.4	2.4	3.8	1.7	19.5			
Cycle Q Clear(g_c), s	10.8	20.1	10.0	5.4	5.4	2.4	3.8	1.7	19.5			
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	717	1652	681	306	557	831	1028	556	1108			
V/C Ratio(X)	0.72	0.71	0.42	0.71	0.29	0.13	0.22	0.10	0.73			
Avail Cap(c_a), veh/h	1321	1817	749	1051	801	1194	1183	640	1234			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	30.0	18.2	16.4	34.4	19.4	18.3	20.7	20.0	20.6			
Incr Delay (d2), s/veh	1.0	1.4	0.6	1.1	0.4	0.1	0.0	0.0	1.6			
Initial Q Delay(d3),s/veh	12.8	0.6	6.9	0.0	0.0	0.0	0.0	0.0	2.2			
%ile BackOfQ(50%),veh/ln	6.6	9.1	6.3	2.0	2.2	0.7	1.5	0.8	0.6			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.9	20.2	23.9	35.6	19.8	18.4	20.8	20.0	24.5			
LnGrp LOS	D	C	C	D	B	B	C	C	C			
Approach Vol, veh/h		1981			486			1090				
Approach Delay, s/veh		26.9			26.5			23.5				
Approach LOS		C			C			C				
Timer - Assigned Phs	1	2		4	5	6						
Phs Duration (G+Y+Rc), s	11.4	39.5		27.3	18.1	32.8						
Change Period (Y+Rc), s	3.5	5.0		4.0	3.5	5.0						
Max Green Setting (Gmax), s	27.0	38.0		27.0	29.0	38.0						
Max Q Clear Time (g_c+I1), s	7.4	22.1		21.5	12.8	7.4						
Green Ext Time (p_c), s	0.6	12.5		1.8	1.9	2.8						
Intersection Summary												
HCM 6th Ctrl Delay			25.8									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	386	1615	94	4	317	25	59	4	6	36	2	92
Future Volume (veh/h)	386	1615	94	4	317	25	59	4	6	36	2	92
Initial Q (Qb), veh	0	32	0	0	26	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1574	1574	1574	1366	1366	1366	1678	1678	1678
Adj Flow Rate, veh/h	420	1755	100	4	345	24	64	4	0	39	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	22	22	22	36	36	36	15	15	15
Cap, veh/h	494	2333	117	9	1558	100	156	163	0	59	3	97
Arrive On Green	0.14	0.68	0.68	0.01	0.55	0.55	0.12	0.12	0.00	0.04	0.04	0.00
Sat Flow, veh/h	3428	3384	191	1499	2835	196	1301	1366	0	1523	78	2502
Grp Volume(v), veh/h	420	906	949	4	181	188	64	4	0	41	0	0
Grp Sat Flow(s),veh/h/ln	1714	1763	1812	1499	1495	1535	1301	1366	0	1602	0	1251
Q Serve(g_s), s	13.1	36.7	38.2	0.3	6.9	7.0	5.0	0.3	0.0	2.8	0.0	0.0
Cycle Q Clear(g_c), s	13.1	36.7	38.2	0.3	6.9	7.0	5.0	0.3	0.0	2.8	0.0	0.0
Prop In Lane	1.00		0.11	1.00		0.13	1.00		0.00	0.95		1.00
Lane Grp Cap(c), veh/h	494	1206	1243	9	817	840	156	163	0	62	0	97
V/C Ratio(X)	0.85	0.75	0.76	0.43	0.22	0.22	0.41	0.02	0.00	0.66	0.00	0.00
Avail Cap(c_a), veh/h	686	1206	1240	123	817	839	367	385	0	160	0	250
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.09	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	45.9	12.6	12.7	54.5	13.9	13.8	44.8	42.8	0.0	52.1	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.4	0.4	10.9	0.6	0.6	0.6	0.0	0.0	4.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	5.1	5.0	0.0	2.3	2.2	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	16.8	17.7	0.1	4.3	4.4	1.7	0.1	0.0	1.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.4	18.1	18.2	65.4	16.8	16.7	45.5	42.8	0.0	56.4	0.0	0.0
LnGrp LOS	D	B	B	E	B	B	D	D	A	E	A	A
Approach Vol, veh/h		2275			373			68			41	
Approach Delay, s/veh		23.4			17.3			45.3			56.4	
Approach LOS		C			B			D			E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	19.9	64.7		17.2	4.7	79.9		8.3				
Change Period (Y+Rc), s	4.0	4.6		4.0	4.0	4.6		4.0				
Max Green Setting (Gmax), s	22.0	29.4		31.0	9.0	42.4		11.0				
Max Q Clear Time (g_c+I1), s	15.1	9.0		7.0	2.3	40.2		4.8				
Green Ext Time (p_c), s	0.7	1.9		0.1	0.0	1.7		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			23.6									
HCM 6th LOS			C									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	1432	35	74	157	139	23	188	378	392	328	211
Future Volume (veh/h)	142	1432	35	74	157	139	23	188	378	392	328	211
Initial Q (Qb), veh	0	50	0	0	0	0	0	0	12	24	24	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1826	1826	1826	1870	1870	1870	1826	1826	1826
Adj Flow Rate, veh/h	149	1507	34	78	165	47	24	198	398	413	345	47
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	5	5	5	2	2	2	5	5	5
Cap, veh/h	186	1896	28	324	986	273	83	272	687	549	848	387
Arrive On Green	0.10	0.36	0.36	0.12	0.39	0.39	0.05	0.14	0.14	0.15	0.24	0.24
Sat Flow, veh/h	1795	5175	117	3374	2684	743	1781	1870	2790	3374	3469	1501
Grp Volume(v), veh/h	149	999	542	78	105	107	24	198	398	413	345	47
Grp Sat Flow(s),veh/h/ln	1795	1716	1861	1687	1735	1692	1781	1870	1395	1687	1735	1501
Q Serve(g_s), s	6.5	21.0	21.0	1.7	3.2	3.3	1.0	8.2	2.6	9.5	6.7	2.0
Cycle Q Clear(g_c), s	6.5	21.0	21.0	1.7	3.2	3.3	1.0	8.2	2.6	9.5	6.7	2.0
Prop In Lane	1.00		0.06	1.00		0.44	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	186	1244	678	324	637	622	83	272	687	549	848	387
V/C Ratio(X)	0.80	0.80	0.80	0.24	0.16	0.17	0.29	0.73	0.58	0.75	0.41	0.12
Avail Cap(c_a), veh/h	292	1244	675	394	673	657	200	304	779	590	821	355
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.98	0.98	0.98	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.0	24.3	24.2	33.5	17.1	17.1	36.9	32.7	11.6	33.0	26.2	22.8
Incr Delay (d2), s/veh	3.7	5.6	9.6	0.1	0.5	0.6	0.7	6.0	0.4	4.3	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	26.3	21.8	0.0	0.0	0.0	0.0	0.0	5.2	55.8	9.7	0.0
%ile BackOfQ(50%),veh/ln	3.0	15.3	16.4	0.7	1.3	1.3	0.5	3.9	2.4	9.2	4.7	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.8	56.2	55.5	33.6	17.6	17.7	37.6	38.7	17.2	93.1	36.1	22.8
LnGrp LOS	D	E	E	C	B	B	D	D	B	F	D	C
Approach Vol, veh/h		1690			290			620			805	
Approach Delay, s/veh		54.4			22.0			24.8			64.6	
Approach LOS		D			C			C			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.7	23.9	12.3	36.1	15.8	15.8	14.3	34.0
Change Period (Y+Rc), s	4.0	5.0	4.0	5.0	4.0	5.0	5.0	* 5
Max Green Setting (Gmax), s	9.0	18.0	13.0	22.0	14.0	13.0	6.0	* 29
Max Q Clear Time (g_c+I1), s	3.0	8.7	8.5	5.3	11.5	10.2	3.7	23.0
Green Ext Time (p_c), s	0.0	1.0	0.1	0.6	0.3	0.6	0.0	3.7

Intersection Summary			
HCM 6th Ctrl Delay			48.7
HCM 6th LOS			D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

User approved changes to right turn type.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	938	2	74	1	0	5	40	114	1	2	150	616
Future Volume (veh/h)	938	2	74	1	0	5	40	114	1	2	150	616
Initial Q (Qb), veh	24	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1411	1411	1411	1781	1781	1781	1767	1767	1767
Adj Flow Rate, veh/h	1021	0	40	1	0	0	43	124	0	2	163	480
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	33	33	33	8	8	8	9	9	9
Cap, veh/h	1424	0	633	3	0	0	64	642	0	92	436	1715
Arrive On Green	0.39	0.00	0.39	0.00	0.00	0.00	0.04	0.37	0.00	0.26	0.26	0.26
Sat Flow, veh/h	3534	0	1572	1344	0	0	1697	1781	0	5	1759	2635
Grp Volume(v), veh/h	1021	0	40	1	0	0	43	124	0	165	0	480
Grp Sat Flow(s),veh/h/ln	1767	0	1572	1344	0	0	1697	1781	0	1764	0	1317
Q Serve(g_s), s	9.8	0.0	0.6	0.0	0.0	0.0	1.0	1.8	0.0	0.0	0.0	3.1
Cycle Q Clear(g_c), s	9.8	0.0	0.6	0.0	0.0	0.0	1.0	1.8	0.0	3.0	0.0	3.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.00	0.01		1.00
Lane Grp Cap(c), veh/h	1424	0	633	3	0	0	64	642	0	528	0	1715
V/C Ratio(X)	0.72	0.00	0.06	0.30	0.00	0.00	0.67	0.19	0.00	0.31	0.00	0.28
Avail Cap(c_a), veh/h	2710	0	1206	687	0	0	867	2641	0	1666	0	3373
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.6	0.0	7.4	20.3	0.0	0.0	19.3	9.1	0.0	12.8	0.0	3.0
Incr Delay (d2), s/veh	0.3	0.0	0.0	43.9	0.0	0.0	11.4	0.1	0.0	0.3	0.0	0.1
Initial Q Delay(d3),s/veh	7.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	0.0	0.2	0.0	0.0	0.0	0.6	0.6	0.0	1.1	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.1	0.0	7.4	64.2	0.0	0.0	30.7	9.2	0.0	13.1	0.0	3.1
LnGrp LOS	B	A	A	E	A	A	C	A	A	B	A	A
Approach Vol, veh/h		1061			1			167			645	
Approach Delay, s/veh		17.7			64.2			14.7			5.7	
Approach LOS		B			E			B			A	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	4.5	13.5		3.0		18.0		18.1				
Change Period (Y+Rc), s	3.0	3.5		3.0		3.5		3.0				
Max Green Setting (Gmax), s	20.0	35.0		20.0		58.0		30.0				
Max Q Clear Time (g_c+I1), s	3.0	5.1		2.0		3.8		11.8				
Green Ext Time (p_c), s	0.1	2.8		0.0		0.4		3.3				
Intersection Summary												
HCM 6th Ctrl Delay			13.3									
HCM 6th LOS			B									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	186	214	82	198	114	63	33	333	282	388	391	124
Future Volume (vph)	186	214	82	198	114	63	33	333	282	388	391	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
Lane Util. Factor		0.95		0.97	1.00	1.00	1.00	0.95	1.00	0.91	0.91	1.00
Frpb, ped/bikes		0.98		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92
Flpb, ped/bikes		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.99	1.00
Satd. Flow (prot)		2999		2814	1527	1298	1464	2927	1309	1421	2954	1281
Flt Permitted		0.98		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.99	1.00
Satd. Flow (perm)		2999		2814	1527	1298	1464	2927	1309	1421	2954	1281
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	196	225	86	208	120	66	35	351	297	408	412	131
RTOR Reduction (vph)	0	17	0	0	0	59	0	0	0	0	0	86
Lane Group Flow (vph)	0	490	0	208	120	7	35	351	297	265	555	45
Confl. Peds. (#/hr)			58									20
Confl. Bikes (#/hr)			9						3			3
Heavy Vehicles (%)	2%	2%	2%	12%	12%	12%	11%	11%	11%	4%	4%	4%
Turn Type	Split	NA		Split	NA	Perm	Split	NA	custom	Split	NA	Perm
Protected Phases	4	4		7	7		6	6	2 6 7!	2!	2	
Permitted Phases						7						2
Actuated Green, G (s)		22.7		11.0	11.0	11.0	16.2	16.2	73.4	36.4	36.4	36.4
Effective Green, g (s)		22.7		11.0	11.0	11.0	16.2	16.2	73.4	36.4	36.4	36.4
Actuated g/C Ratio		0.22		0.10	0.10	0.10	0.15	0.15	0.70	0.35	0.35	0.35
Clearance Time (s)		4.0		4.9	4.9	4.9	4.9	4.9		4.9	4.9	4.9
Vehicle Extension (s)		2.0		3.0	3.0	3.0	2.5	2.5		2.0	2.0	2.0
Lane Grp Cap (vph)		648		294	159	135	225	451	915	492	1024	444
v/s Ratio Prot		c0.16		0.07	c0.08		0.02	c0.12	0.23	0.19	c0.19	
v/s Ratio Perm						0.01						0.04
v/c Ratio		0.76		0.71	0.75	0.05	0.16	0.78	0.32	0.54	0.54	0.10
Uniform Delay, d1		38.6		45.4	45.7	42.3	38.5	42.7	6.2	27.6	27.6	23.2
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		4.5		7.6	18.2	0.2	0.2	7.9	0.2	4.2	2.1	0.5
Delay (s)		43.0		53.0	63.9	42.5	38.7	50.6	6.3	31.7	29.7	23.7
Level of Service		D		D	E	D	D	D	A	C	C	C
Approach Delay (s)		43.0			54.6			30.7			29.4	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	36.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	18.7
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	42	842	518	40	54	19
Future Volume (vph)	42	842	518	40	54	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9	4.9		4.2	4.2
Lane Util. Factor	1.00	0.91	0.91		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1736	4988	4541		1703	1524
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1736	4988	4541		1703	1524
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	45	905	557	43	58	20
RTOR Reduction (vph)	0	0	3	0	0	18
Lane Group Flow (vph)	45	905	597	0	58	2
Heavy Vehicles (%)	4%	4%	13%	13%	6%	6%
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	5	2	6		3	
Permitted Phases						3
Actuated Green, G (s)	5.6	81.3	71.7		9.6	9.6
Effective Green, g (s)	5.6	81.3	71.7		9.6	9.6
Actuated g/C Ratio	0.06	0.81	0.72		0.10	0.10
Clearance Time (s)	4.0	4.9	4.9		4.2	4.2
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	97	4055	3255		163	146
v/s Ratio Prot	c0.03	c0.18	0.13		c0.03	
v/s Ratio Perm						0.00
v/c Ratio	0.46	0.22	0.18		0.36	0.01
Uniform Delay, d1	45.7	2.1	4.6		42.3	40.9
Progression Factor	1.00	1.00	0.96		1.00	1.00
Incremental Delay, d2	1.3	0.1	0.1		0.5	0.0
Delay (s)	47.0	2.3	4.5		42.8	40.9
Level of Service	D	A	A		D	D
Approach Delay (s)		4.4	4.5		42.3	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	6.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.1
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBU	EBL	EBT	EBR	WBL2	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	1	318	1257	354	46	402	20	208	92	127	7	16
Future Volume (vph)	1	318	1257	354	46	402	20	208	92	127	7	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.6		4.0	4.6		4.0	4.0	4.0		4.0
Lane Util. Factor		1.00	0.91		1.00	0.91		0.91	0.91	1.00		0.95
Frpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00	0.93		0.99
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00
Frt		1.00	0.97		1.00	0.99		1.00	1.00	0.85		0.92
Flt Protected		0.95	1.00		0.95	1.00		0.95	0.99	1.00		0.99
Satd. Flow (prot)		1752	4850		1480	4213		3042	1586	1395		2789
Flt Permitted		0.95	1.00		0.95	1.00		0.95	0.99	1.00		0.99
Satd. Flow (perm)		1752	4850		1480	4213		3042	1586	1395		2789
Peak-hour factor, PHF	0.92	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	1	361	1428	402	52	457	23	236	105	144	8	18
RTOR Reduction (vph)	0	0	0	0	0	4	0	0	0	116	0	51
Lane Group Flow (vph)	0	362	1830	0	52	476	0	212	129	28	0	2
Confl. Peds. (#/hr)							9			51		
Confl. Bikes (#/hr)				9			1			4		
Heavy Vehicles (%)	2%	3%	3%	3%	22%	22%	22%	8%	8%	8%	17%	17%
Turn Type	Prot	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA
Protected Phases	1	1	6		5	2		4	4		7	7
Permitted Phases										4		
Actuated Green, G (s)		14.6	36.4		7.3	29.1		23.0	23.0	23.0		3.4
Effective Green, g (s)		14.6	36.4		7.3	29.1		23.0	23.0	23.0		3.4
Actuated g/C Ratio		0.12	0.31		0.06	0.24		0.19	0.19	0.19		0.03
Clearance Time (s)		4.0	4.6		4.0	4.6		4.0	4.0	4.0		4.0
Vehicle Extension (s)		2.0	3.0		2.0	3.0		2.0	2.0	2.0		2.0
Lane Grp Cap (vph)		214	1482		90	1029		587	306	269		79
v/s Ratio Prot		c0.21	c0.38		0.04	0.11		0.07	c0.08			c0.00
v/s Ratio Perm										0.02		
v/c Ratio		1.69	1.23		0.58	0.46		0.36	0.42	0.10		0.02
Uniform Delay, d1		52.2	41.4		54.4	38.3		41.7	42.2	39.6		56.2
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00
Incremental Delay, d2		330.6	111.7		5.5	0.3		0.1	0.3	0.1		0.0
Delay (s)		382.8	153.1		59.9	38.7		41.8	42.5	39.6		56.3
Level of Service		F	F		E	D		D	D	D		E
Approach Delay (s)			191.0			40.7			41.4			56.3
Approach LOS			F			D			D			E

Intersection Summary			
HCM 2000 Control Delay	124.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	119.1	Sum of lost time (s)	21.1
Intersection Capacity Utilization	99.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR2	NER	NER2
Lane Configurations			
Traffic Volume (vph)	24	704	366
Future Volume (vph)	24	704	366
Ideal Flow (vphpl)	1900	1990	1900
Total Lost time (s)		4.5	4.5
Lane Util. Factor		*0.95	1.00
Frpb, ped/bikes		1.00	1.00
Flpb, ped/bikes		1.00	1.00
Frt		1.00	0.85
Flt Protected		1.00	1.00
Satd. Flow (prot)		3781	1615
Flt Permitted		1.00	1.00
Satd. Flow (perm)		3781	1615
Peak-hour factor, PHF	0.88	0.88	0.88
Adj. Flow (vph)	27	800	416
RTOR Reduction (vph)	0	0	0
Lane Group Flow (vph)	0	800	416
Confl. Peds. (#/hr)			63
Confl. Bikes (#/hr)	2		
Heavy Vehicles (%)	17%	0%	0%
Turn Type		Prot	Prot
Protected Phases		3	3
Permitted Phases			
Actuated Green, G (s)		27.9	27.9
Effective Green, g (s)		27.9	27.9
Actuated g/C Ratio		0.23	0.23
Clearance Time (s)		4.5	4.5
Vehicle Extension (s)		2.0	2.0
Lane Grp Cap (vph)		885	378
v/s Ratio Prot		0.21	c0.26
v/s Ratio Perm			
v/c Ratio		0.90	1.10
Uniform Delay, d1		44.3	45.6
Progression Factor		1.00	1.00
Incremental Delay, d2		12.2	76.2
Delay (s)		56.5	121.8
Level of Service		E	F
Approach Delay (s)			
Approach LOS			

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	477	3	1	116	24	2	2	0	51	2	70
Future Volume (vph)	135	477	3	1	116	24	2	2	0	51	2	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.97			1.00			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.95	1.00
Satd. Flow (prot)	1752	3502		1378	2670			1854			1523	1357
Flt Permitted	0.95	1.00		0.95	1.00			1.00			0.73	1.00
Satd. Flow (perm)	1752	3502		1378	2670			1900			1167	1357
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	157	555	3	1	135	28	2	2	0	59	2	81
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	71
Lane Group Flow (vph)	157	558	0	1	163	0	0	4	0	0	61	10
Confl. Peds. (#/hr)						11						
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	3%	3%	3%	31%	31%	31%	0%	0%	0%	19%	19%	19%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			3			4	
Permitted Phases							3			4		4
Actuated Green, G (s)	9.1	27.5		0.6	19.0			0.6			6.2	6.2
Effective Green, g (s)	9.1	27.5		0.6	19.0			0.6			6.2	6.2
Actuated g/C Ratio	0.18	0.54		0.01	0.37			0.01			0.12	0.12
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Vehicle Extension (s)	2.0	2.5		2.0	2.5			2.0			2.0	2.0
Lane Grp Cap (vph)	313	1892		16	996			22			142	165
v/s Ratio Prot	c0.09	c0.16		0.00	0.06							
v/s Ratio Perm								c0.00			c0.05	0.01
v/c Ratio	0.50	0.29		0.06	0.16			0.18			0.43	0.06
Uniform Delay, d1	18.9	6.4		24.9	10.6			24.9			20.7	19.8
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.5	0.1		0.6	0.1			1.4			0.8	0.1
Delay (s)	19.3	6.5		25.5	10.7			26.4			21.5	19.8
Level of Service	B	A		C	B			C			C	B
Approach Delay (s)		9.3			10.8			26.4			20.5	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	50.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	35.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Intersection Delay, s/veh	21.1
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	79	24	104	419	2	318	0	73	0	1	0
Future Vol, veh/h	3	79	24	104	419	2	318	0	73	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	22	22	22	10	10	10	7	7	7	100	100	100
Mvmt Flow	3	83	25	109	441	2	335	0	77	0	1	0
Number of Lanes	0	1	1	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	11	24.1	19.9	12.2
HCM LOS	B	C	C	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	100%	0%	4%	0%	100%	0%	0%
Vol Thru, %	0%	0%	96%	0%	0%	100%	100%
Vol Right, %	0%	100%	0%	100%	0%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	318	73	82	24	104	421	1
LT Vol	318	0	3	0	104	0	0
Through Vol	0	0	79	0	0	419	1
RT Vol	0	73	0	24	0	2	0
Lane Flow Rate	335	77	86	25	109	443	1
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.656	0.125	0.173	0.045	0.207	0.773	0.003
Departure Headway (Hd)	7.059	5.846	7.199	6.464	6.791	6.28	9.069
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	512	612	497	552	529	576	393
Service Time	4.808	3.595	4.966	4.23	4.535	4.025	7.152
HCM Lane V/C Ratio	0.654	0.126	0.173	0.045	0.206	0.769	0.003
HCM Control Delay	22.3	9.4	11.5	9.5	11.3	27.3	12.2
HCM Lane LOS	C	A	B	A	B	D	B
HCM 95th-tile Q	4.7	0.4	0.6	0.1	0.8	7.1	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	4	61	8	4	12	27	579	5	8	253	12
Future Volume (veh/h)	130	4	61	8	4	12	27	579	5	8	253	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	22	0	0	0	0
Ped-Bike Adj(A_pbT)	0.96		0.96	0.96		0.95	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1648	1648	1648	1796	1796	1796	1811	1811	1811
Adj Flow Rate, veh/h	141	4	6	9	4	1	29	629	5	9	275	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	17	17	17	7	7	7	6	6	6
Cap, veh/h	334	117	176	301	222	56	83	2160	16	31	2003	73
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.05	0.62	0.62	0.02	0.59	0.59
Sat Flow, veh/h	1370	664	996	1193	1257	314	1711	3469	28	1725	3382	123
Grp Volume(v), veh/h	141	0	10	9	0	5	29	309	325	9	139	146
Grp Sat Flow(s),veh/h/ln	1370	0	1660	1193	0	1572	1711	1706	1790	1725	1721	1784
Q Serve(g_s), s	7.1	0.0	0.4	0.5	0.0	0.2	1.2	6.3	6.3	0.4	2.7	2.7
Cycle Q Clear(g_c), s	7.3	0.0	0.4	0.8	0.0	0.2	1.2	6.3	6.3	0.4	2.7	2.7
Prop In Lane	1.00		0.60	1.00		0.20	1.00		0.02	1.00		0.07
Lane Grp Cap(c), veh/h	334	0	293	301	0	278	83	1062	1114	31	1019	1057
V/C Ratio(X)	0.42	0.00	0.03	0.03	0.00	0.02	0.35	0.29	0.29	0.29	0.14	0.14
Avail Cap(c_a), veh/h	657	0	684	582	0	647	237	1062	1114	239	1019	1057
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.5	0.0	25.6	25.9	0.0	25.5	34.5	7.0	7.0	36.3	6.8	6.8
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.0	0.0	0.0	0.9	0.7	0.7	1.8	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	0.1	0.1	0.0	0.1	0.5	3.1	3.2	0.2	0.9	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.8	0.0	25.6	25.9	0.0	25.5	35.5	8.8	8.6	38.2	7.1	7.1
LnGrp LOS	C	A	C	C	A	C	D	A	A	D	A	A
Approach Vol, veh/h		151			14			663			294	
Approach Delay, s/veh		28.6			25.8			9.9			8.0	
Approach LOS		C			C			A			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.4	51.8		17.9	7.6	49.5		17.9				
Change Period (Y+Rc), s	4.0	5.1		4.6	4.0	5.1		4.6				
Max Green Setting (Gmax), s	10.4	20.0		30.9	10.4	20.0		30.9				
Max Q Clear Time (g_c+I1), s	2.4	8.3		9.3	3.2	4.7		2.8				
Green Ext Time (p_c), s	0.0	2.1		0.2	0.0	0.9		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			12.1									
HCM 6th LOS			B									

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	217	28	11	1409	233	229
Future Volume (veh/h)	217	28	11	1409	233	229
Initial Q (Qb), veh	0	0	0	30	5	0
Ped-Bike Adj(A_pbT)		0.96	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1781	1781	1856	1856	1781	1781
Adj Flow Rate, veh/h	219	19	11	1423	235	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	8	8	3	3	8	8
Cap, veh/h	3106	263	28	3703	296	
Arrive On Green	1.00	1.00	0.02	0.76	0.16	0.00
Sat Flow, veh/h	4712	385	1767	5233	1697	2657
Grp Volume(v), veh/h	154	84	11	1423	235	0
Grp Sat Flow(s),veh/h/ln	1621	1694	1767	1689	1697	1329
Q Serve(g_s), s	0.0	0.0	0.6	9.5	13.4	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.6	9.5	13.4	0.0
Prop In Lane		0.23	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2213	1156	28	3703	296	
V/C Ratio(X)	0.07	0.07	0.39	0.38	0.79	
Avail Cap(c_a), veh/h	2272	1187	141	3832	696	
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.83	0.83	1.00	0.00
Uniform Delay (d), s/veh	0.2	0.2	48.7	6.2	40.1	0.0
Incr Delay (d2), s/veh	0.1	0.1	2.8	0.3	4.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.8	10.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.3	4.6	7.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.2	0.3	51.5	7.3	55.0	0.0
LnGrp LOS	A	A	D	A	E	
Approach Vol, veh/h	238			1434	235	A
Approach Delay, s/veh	0.3			7.6	55.0	
Approach LOS	A			A	E	

Timer - Assigned Phs	1	2	6	8
Phs Duration (G+Y+Rc), s	5.6	74.1	79.6	20.4
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	8.0	39.0	51.0	41.0
Max Q Clear Time (g_c+I1), s	2.6	2.0	11.5	15.4
Green Ext Time (p_c), s	0.0	1.0	8.7	0.9

Intersection Summary	
HCM 6th Ctrl Delay	12.5
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	103	267	76	351	1134	177	75	125	70	59	314	211
Future Volume (veh/h)	103	267	76	351	1134	177	75	125	70	59	314	211
Initial Q (Qb), veh	0	0	0	0	34	0	0	0	0	0	32	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.95	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1722	1722	1722	1870	1870	1870	1767	1767	1767	1856	1856	1856
Adj Flow Rate, veh/h	106	275	51	362	1169	171	77	129	0	61	324	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	12	12	12	2	2	2	9	9	9	3	3	3
Cap, veh/h	405	1703	304	381	1776	219	151	523		152	530	
Arrive On Green	0.27	0.45	0.45	0.43	0.77	0.77	0.09	0.13	0.00	0.09	0.12	0.00
Sat Flow, veh/h	1640	4003	714	1781	4461	652	1682	3445	0	1767	3618	0
Grp Volume(v), veh/h	106	213	113	362	892	448	77	129	0	61	324	0
Grp Sat Flow(s),veh/h/ln	1640	1567	1583	1781	1702	1710	1682	1678	0	1767	1763	0
Q Serve(g_s), s	7.5	6.0	6.3	29.4	18.7	18.7	6.5	5.2	0.0	4.9	13.4	0.0
Cycle Q Clear(g_c), s	7.5	6.0	6.3	29.4	18.7	18.7	6.5	5.2	0.0	4.9	13.4	0.0
Prop In Lane	1.00		0.45	1.00		0.38	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	405	1333	673	381	1316	669	151	523		152	530	
V/C Ratio(X)	0.26	0.16	0.17	0.95	0.68	0.67	0.51	0.25		0.40	0.61	
Avail Cap(c_a), veh/h	451	1422	718	539	1316	661	214	866		225	917	
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.99	0.99	0.99	0.67	0.67	0.67	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	45.7	26.8	26.9	42.1	13.5	13.3	65.1	55.8	0.0	64.9	62.1	0.0
Incr Delay (d2), s/veh	0.1	0.3	0.5	14.4	1.9	3.6	1.0	0.1	0.0	0.6	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	6.6	6.3	0.0	0.0	0.0	0.0	67.5	0.0
%ile BackOfQ(50%),veh/ln	3.2	2.5	2.7	12.5	7.1	7.3	2.9	2.2	0.0	2.2	13.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.9	27.1	27.5	56.5	22.0	23.1	66.1	55.9	0.0	65.5	130.1	0.0
LnGrp LOS	D	C	C	E	C	C	E	E		E	F	
Approach Vol, veh/h		432			1702			206	A		385	A
Approach Delay, s/veh		31.8			29.6			59.7			119.8	
Approach LOS		C			C			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	36.1	72.9	18.3	22.6	46.1	62.9	16.9	24.1
Change Period (Y+Rc), s	4.0	4.9	4.9	* 4.6	4.9	* 4.9	4.0	4.9
Max Green Setting (Gmax), s	45.4	29.0	19.1	* 39	16.4	* 58	19.1	38.7
Max Q Clear Time (g_c+I1), s	31.4	8.3	8.5	15.4	9.5	20.7	6.9	7.2
Green Ext Time (p_c), s	0.7	1.3	0.1	1.2	0.1	7.3	0.1	0.5

Intersection Summary	
HCM 6th Ctrl Delay	45.0
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	109	216	71	86	1100	14	188	34	29	36	186	374
Future Volume (veh/h)	109	216	71	86	1100	14	188	34	29	36	186	374
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.88	1.00		0.97	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1663	1663	1663	1856	1856	1856	1767	1767	1767	1826	1826	1826
Adj Flow Rate, veh/h	115	227	75	91	1158	14	224	0	2	38	196	166
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	16	16	16	3	3	3	9	9	9	5	5	5
Cap, veh/h	916	1266	406	161	1189	14	302	0	130	278	291	238
Arrive On Green	0.20	0.36	0.36	0.09	0.33	0.33	0.09	0.00	0.09	0.16	0.16	0.16
Sat Flow, veh/h	3072	2341	751	1767	3561	43	3365	0	1452	1739	1826	1493
Grp Volume(v), veh/h	115	151	151	91	573	599	224	0	2	38	196	166
Grp Sat Flow(s),veh/h/ln	1536	1580	1512	1767	1763	1841	1682	0	1452	1739	1826	1493
Q Serve(g_s), s	4.6	9.8	10.2	7.4	48.1	48.2	9.7	0.0	0.2	2.8	15.2	15.8
Cycle Q Clear(g_c), s	4.6	9.8	10.2	7.4	48.1	48.2	9.7	0.0	0.2	2.8	15.2	15.8
Prop In Lane	1.00		0.50	1.00		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	916	854	818	161	589	615	302	0	130	278	291	238
V/C Ratio(X)	0.13	0.18	0.18	0.56	0.97	0.97	0.74	0.00	0.02	0.14	0.67	0.70
Avail Cap(c_a), veh/h	916	854	818	284	589	615	628	0	271	475	499	408
HCM Platoon Ratio	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.98	0.98	0.98	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.0	25.1	25.2	65.3	49.3	49.3	66.6	0.0	62.2	54.2	59.3	59.6
Incr Delay (d2), s/veh	0.1	0.4	0.5	1.2	31.1	30.4	1.4	0.0	0.0	0.1	1.0	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	4.0	4.0	3.4	26.2	27.3	4.2	0.0	0.1	1.3	7.1	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.0	25.5	25.7	66.5	80.4	79.7	67.9	0.0	62.3	54.2	60.3	61.0
LnGrp LOS	D	C	C	E	F	E	E	A	E	D	E	E
Approach Vol, veh/h		417			1263			226			400	
Approach Delay, s/veh		30.7			79.1			67.9			60.0	
Approach LOS		C			E			E			E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	48.7	55.0		27.9	18.6	85.1		18.3				
Change Period (Y+Rc), s	4.0	4.9		4.0	4.9	4.0		4.9				
Max Green Setting (Gmax), s	13.1	50.1		41.0	24.1	39.1		28.0				
Max Q Clear Time (g_c+I1), s	6.6	50.2		17.8	9.4	12.2		11.7				
Green Ext Time (p_c), s	0.2	0.0		1.2	0.1	1.7		0.5				
Intersection Summary												
HCM 6th Ctrl Delay			65.9									
HCM 6th LOS			E									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	100	391	58	355	14	486	195	61	5	189	546
Future Volume (veh/h)	50	100	391	58	355	14	486	195	61	5	189	546
Initial Q (Qb), veh	0	0	0	0	25	0	0	0	0	0	72	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		1.00	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1781	1781	1811	1811	1811	1767	1767	1767	1841	1841	1841
Adj Flow Rate, veh/h	53	143	131	62	378	13	517	207	0	5	201	346
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	8	8	8	6	6	6	9	9	9	4	4	4
Cap, veh/h	127	482	402	137	494	4	831	855		391	410	332
Arrive On Green	0.07	0.23	0.23	0.08	0.24	0.24	0.29	0.29	0.00	0.22	0.22	0.22
Sat Flow, veh/h	1697	1781	1484	1725	1739	60	3264	3445	0	1753	1841	1489
Grp Volume(v), veh/h	53	143	131	62	0	391	517	207	0	5	201	346
Grp Sat Flow(s),veh/h/ln	1697	1781	1484	1725	0	1798	1632	1678	0	1753	1841	1489
Q Serve(g_s), s	3.1	7.0	7.8	3.6	0.0	22.2	14.0	4.9	0.0	0.2	10.0	23.4
Cycle Q Clear(g_c), s	3.1	7.0	7.8	3.6	0.0	22.2	14.0	4.9	0.0	0.2	10.0	23.4
Prop In Lane	1.00		1.00	1.00		0.03	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	127	482	402	137	0	494	831	855		391	410	332
V/C Ratio(X)	0.42	0.30	0.33	0.45	0.00	0.79	0.62	0.24		0.01	0.49	1.04
Avail Cap(c_a), veh/h	179	492	410	182	0	497	955	982		391	410	332
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.73	0.73	0.73	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.4	30.4	30.6	46.1	0.0	38.1	34.7	31.1	0.0	31.8	40.8	40.8
Incr Delay (d2), s/veh	0.6	0.2	0.3	0.9	0.0	7.8	3.5	0.7	0.0	0.0	0.3	60.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	88.7	0.0	0.0	0.0	0.0	402.4	0.0
%ile BackOfQ(50%),veh/ln	1.3	2.9	2.7	1.6	0.0	25.6	6.1	2.1	0.0	0.1	56.3	14.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.0	30.6	30.9	47.0	0.0	134.5	38.2	31.8	0.0	31.8	443.5	101.7
LnGrp LOS	D	C	C	D	A	F	D	C		C	F	F
Approach Vol, veh/h		327			453			724	A		552	
Approach Delay, s/veh		33.4			122.5			36.3			225.5	
Approach LOS		C			F			D			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.4	29.0		35.3	11.9	29.5		28.3
Change Period (Y+Rc), s	4.0	4.6		4.6	4.0	4.6		4.9
Max Green Setting (Gmax), s	11.1	29.0		23.4	11.1	29.0		23.4
Max Q Clear Time (g_c+I1), s	5.6	9.8		16.0	5.1	24.2		25.4
Green Ext Time (p_c), s	0.0	1.0		1.6	0.0	0.7		0.0

Intersection Summary	
HCM 6th Ctrl Delay	105.6
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	169	169	200	785	224	378	101	15	269	158	839	130
Future Volume (veh/h)	169	169	200	785	224	378	101	15	269	158	839	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1811	1811	1678	1678	1678	1856	1856	1856
Adj Flow Rate, veh/h	199	148	0	826	236	0	106	16	0	166	883	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	6	6	6	6	6	6	15	15	15	3	3	3
Cap, veh/h	381	200		893	469		142	821		380	1378	
Arrive On Green	0.11	0.11	0.00	0.26	0.26	0.00	0.09	0.26	0.00	0.21	0.39	0.00
Sat Flow, veh/h	3450	1811	1535	3450	1811	1535	1598	3272	0	1767	3526	1572
Grp Volume(v), veh/h	199	148	0	826	236	0	106	16	0	166	883	0
Grp Sat Flow(s),veh/h/ln	1725	1811	1535	1725	1811	1535	1598	1594	0	1767	1763	1572
Q Serve(g_s), s	6.5	9.5	0.0	28.0	13.3	0.0	7.8	0.4	0.0	9.8	24.4	0.0
Cycle Q Clear(g_c), s	6.5	9.5	0.0	28.0	13.3	0.0	7.8	0.4	0.0	9.8	24.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	381	200		893	469		142	821		380	1378	
V/C Ratio(X)	0.52	0.74		0.93	0.50		0.75	0.02		0.44	0.64	
Avail Cap(c_a), veh/h	635	334		914	480		160	821		380	1378	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.44	0.44	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	50.4	51.7	0.0	43.3	37.9	0.0	53.3	33.2	0.0	40.8	29.7	0.0
Incr Delay (d2), s/veh	0.4	2.0	0.0	7.6	0.4	0.0	12.7	0.0	0.0	0.3	2.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	4.4	0.0	12.9	6.0	0.0	3.6	0.2	0.0	4.3	10.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.8	53.7	0.0	50.9	38.3	0.0	66.0	33.3	0.0	41.1	32.0	0.0
LnGrp LOS	D	D		D	D		E	C		D	C	
Approach Vol, veh/h		347	A		1062	A		122	A		1049	A
Approach Delay, s/veh		52.1			48.1			61.7			33.4	
Approach LOS		D			D			E			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.7	51.8		17.8	30.7	35.8		35.7				
Change Period (Y+Rc), s	4.0	4.9		4.6	4.9	* 4.9		4.6				
Max Green Setting (Gmax), s	12.0	36.0		22.1	17.1	* 31		31.8				
Max Q Clear Time (g_c+I1), s	9.8	26.4		11.5	11.8	2.4		30.0				
Green Ext Time (p_c), s	0.0	4.5		0.8	0.1	0.0		1.1				

Intersection Summary		
HCM 6th Ctrl Delay		43.3
HCM 6th LOS		D

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	274	0	76	4	0	27	10	887	3	31	151	44
Future Volume (veh/h)	274	0	76	4	0	27	10	887	3	31	151	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	44	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1841	1841	1841	1796	1796	1796
Adj Flow Rate, veh/h	311	0	66	5	0	4	11	1008	3	35	172	45
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	4	4	4	7	7	7
Cap, veh/h	372	0	438	64	18	14	19	1991	5	45	1536	390
Arrive On Green	0.27	0.00	0.27	0.27	0.00	0.27	0.01	0.56	0.56	0.03	0.57	0.57
Sat Flow, veh/h	1056	0	1596	0	65	52	1753	3577	11	1711	2685	682
Grp Volume(v), veh/h	311	0	66	9	0	0	11	493	518	35	107	110
Grp Sat Flow(s),veh/h/ln	1056	0	1596	117	0	0	1753	1749	1839	1711	1706	1661
Q Serve(g_s), s	0.0	0.0	2.7	0.0	0.0	0.0	0.5	15.2	15.2	1.8	2.5	2.6
Cycle Q Clear(g_c), s	24.0	0.0	2.7	24.0	0.0	0.0	0.5	15.2	15.2	1.8	2.5	2.6
Prop In Lane	1.00		1.00	0.56		0.44	1.00		0.01	1.00		0.41
Lane Grp Cap(c), veh/h	372	0	438	96	0	0	19	973	1023	45	976	950
V/C Ratio(X)	0.84	0.00	0.15	0.09	0.00	0.00	0.59	0.51	0.51	0.78	0.11	0.12
Avail Cap(c_a), veh/h	372	0	438	96	0	0	481	973	1023	470	976	950
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.5	0.0	24.0	26.0	0.0	0.0	43.1	13.3	13.3	42.3	8.6	8.6
Incr Delay (d2), s/veh	14.4	0.0	0.1	0.2	0.0	0.0	10.3	1.9	1.8	10.4	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.5	6.7	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.0	0.0	1.0	0.1	0.0	0.0	0.3	10.1	10.3	0.9	0.9	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.9	0.0	24.1	26.2	0.0	0.0	53.3	22.7	21.8	52.7	8.8	8.8
LnGrp LOS	D	A	C	C	A	A	D	C	C	D	A	A
Approach Vol, veh/h		377			9			1022			252	
Approach Delay, s/veh		42.9			26.2			22.6			14.9	
Approach LOS		D			C			C			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.3	53.1		28.0	4.9	54.5		28.0				
Change Period (Y+Rc), s	4.0	4.5		4.0	4.0	4.5		4.0				
Max Green Setting (Gmax), s	24.0	30.0		24.0	24.0	50.0		24.0				
Max Q Clear Time (g_c+I1), s	3.8	17.2		26.0	2.5	4.6		26.0				
Green Ext Time (p_c), s	0.0	3.7		0.0	0.0	0.9		0.0				

Intersection Summary			
HCM 6th Ctrl Delay			26.0
HCM 6th LOS			C

Notes
User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	245	212	295	833	666	1028	490	153	190	0	0	0
Future Volume (veh/h)	245	212	295	833	666	1028	490	153	190	0	0	0
Initial Q (Qb), veh	0	0	0	32	16	0	10	0	5			
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1841	1841	1841	1870	1870	1870	1826	1826	1826			
Adj Flow Rate, veh/h	258	223	80	877	701	686	516	161	200			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	4	4	4	2	2	2	5	5	5			
Cap, veh/h	386	1042	426	1061	868	1328	741	445	1395			
Arrive On Green	0.11	0.31	0.31	0.30	0.49	0.49	0.21	0.21	0.21			
Sat Flow, veh/h	3506	3681	1507	3456	1870	2790	3374	1826	2723			
Grp Volume(v), veh/h	258	223	80	877	701	686	516	161	200			
Grp Sat Flow(s),veh/h/ln	1753	1841	1507	1728	1870	1395	1687	1826	1362			
Q Serve(g_s), s	4.8	3.1	2.7	16.3	20.8	11.3	9.7	5.2	2.7			
Cycle Q Clear(g_c), s	4.8	3.1	2.7	16.3	20.8	11.3	9.7	5.2	2.7			
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	386	1042	426	1061	868	1328	741	445	1395			
V/C Ratio(X)	0.67	0.21	0.19	0.83	0.81	0.52	0.70	0.36	0.14			
Avail Cap(c_a), veh/h	1485	2043	837	1363	1038	1548	1330	720	1887			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	31.7	20.6	20.4	27.2	19.5	13.7	25.4	23.0	8.9			
Incr Delay (d2), s/veh	1.5	0.1	0.3	2.7	4.5	0.4	0.4	0.2	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	37.7	12.7	0.0	4.3	0.0	0.1			
%ile BackOfQ(50%),veh/ln	2.3	1.5	1.1	15.2	16.3	3.8	4.8	2.3	2.8			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.2	20.7	20.7	67.5	36.8	14.1	30.2	23.2	9.1			
LnGrp LOS	C	C	C	E	D	B	C	C	A			
Approach Vol, veh/h		561			2264			877				
Approach Delay, s/veh		26.5			41.8			24.1				
Approach LOS		C			D			C				
Timer - Assigned Phs	1	2		4	5	6						
Phs Duration (G+Y+Rc), s	23.9	26.0		18.5	11.2	38.7						
Change Period (Y+Rc), s	3.5	5.0		4.0	3.5	5.0						
Max Green Setting (Gmax), s	27.0	38.0		27.0	29.0	38.0						
Max Q Clear Time (g_c+I1), s	18.3	5.1		11.7	6.8	22.8						
Green Ext Time (p_c), s	2.1	3.5		2.8	0.9	10.9						
Intersection Summary												
HCM 6th Ctrl Delay			35.3									
HCM 6th LOS			D									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	121	292	30	5	931	41	99	1	18	27	0	274
Future Volume (veh/h)	121	292	30	5	931	41	99	1	18	27	0	274
Initial Q (Qb), veh	0	32	0	0	140	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1678	1678	1678	1870	1870	1870	1841	1841	1841	1870	1870	1870
Adj Flow Rate, veh/h	133	321	30	5	1023	43	109	1	0	30	0	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	15	15	15	2	2	2	4	4	4	2	2	2
Cap, veh/h	176	2172	189	11	2410	73	195	204	0	53	0	82
Arrive On Green	0.06	0.73	0.73	0.01	0.68	0.68	0.11	0.11	0.00	0.03	0.00	0.00
Sat Flow, veh/h	3100	2937	272	1781	3473	146	1753	1841	0	1781	0	2790
Grp Volume(v), veh/h	133	173	178	5	523	543	109	1	0	30	0	0
Grp Sat Flow(s),veh/h/ln	1550	1594	1615	1781	1777	1842	1753	1841	0	1781	0	1395
Q Serve(g_s), s	5.9	4.5	4.6	0.4	18.5	18.5	8.3	0.1	0.0	2.3	0.0	0.0
Cycle Q Clear(g_c), s	5.9	4.5	4.6	0.4	18.5	18.5	8.3	0.1	0.0	2.3	0.0	0.0
Prop In Lane	1.00		0.17	1.00		0.08	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	176	1171	1189	11	1216	1265	195	204	0	53	0	82
V/C Ratio(X)	0.76	0.15	0.15	0.44	0.43	0.43	0.56	0.00	0.00	0.57	0.00	0.00
Avail Cap(c_a), veh/h	221	1171	1187	102	1216	1260	388	408	0	140	0	219
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.98	0.98	0.98	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	65.1	6.4	6.3	69.3	14.8	14.6	59.0	55.3	0.0	67.1	0.0	0.0
Incr Delay (d2), s/veh	7.8	0.3	0.3	9.9	1.1	1.1	0.9	0.0	0.0	3.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	1.6	1.5	0.0	41.9	38.6	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	3.9	4.0	0.2	32.9	32.5	3.8	0.0	0.0	1.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.9	8.2	8.1	79.2	57.9	54.2	59.9	55.3	0.0	70.6	0.0	0.0
LnGrp LOS	E	A	A	E	E	D	E	E	A	E	A	A
Approach Vol, veh/h		484			1071			110			30	
Approach Delay, s/veh		25.9			56.1			59.9			70.6	
Approach LOS		C			E			E			E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.9	100.4		19.6	4.9	107.4		8.1				
Change Period (Y+Rc), s	4.0	4.6		4.0	4.0	4.6		4.0				
Max Green Setting (Gmax), s	10.0	71.4		31.0	8.0	73.4		11.0				
Max Q Clear Time (g_c+I1), s	7.9	20.5		10.3	2.4	6.6		4.3				
Green Ext Time (p_c), s	0.1	8.2		0.2	0.0	2.1		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			48.0									
HCM 6th LOS			D									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	360	28	196	883	77	68	285	212	180	468	521
Future Volume (veh/h)	118	360	28	196	883	77	68	285	212	180	468	521
Initial Q (Qb), veh	0	0	0	0	10	0	0	0	32	0	36	18
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1885	1885	1885	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	120	367	23	200	901	75	69	291	216	184	478	224
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	1	1	1	2	2	2	2	2	2
Cap, veh/h	150	1740	108	389	1285	99	114	365	851	574	1088	468
Arrive On Green	0.08	0.35	0.35	0.11	0.38	0.38	0.06	0.18	0.18	0.18	0.31	0.31
Sat Flow, veh/h	1781	4908	304	3483	3341	278	1781	1870	2790	3456	3554	1529
Grp Volume(v), veh/h	120	253	137	200	483	493	69	291	216	184	478	224
Grp Sat Flow(s),veh/h/ln	1781	1702	1808	1742	1791	1828	1781	1870	1395	1728	1777	1529
Q Serve(g_s), s	7.3	5.7	5.8	6.0	25.1	25.1	4.1	16.6	0.0	5.1	11.9	10.0
Cycle Q Clear(g_c), s	7.3	5.7	5.8	6.0	25.1	25.1	4.1	16.6	0.0	5.1	11.9	10.0
Prop In Lane	1.00		0.17	1.00		0.15	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	150	1207	641	389	684	699	114	365	851	574	1088	468
V/C Ratio(X)	0.80	0.21	0.21	0.51	0.71	0.70	0.61	0.80	0.25	0.32	0.44	0.48
Avail Cap(c_a), veh/h	162	1207	641	412	684	698	130	493	1047	624	1088	468
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.60	0.60	0.60	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.4	24.8	24.8	46.0	29.3	29.3	50.1	42.3	30.6	40.5	32.4	19.1
Incr Delay (d2), s/veh	20.2	0.4	0.8	0.2	3.7	3.6	3.4	16.5	0.7	0.1	1.3	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	1.3	1.2	0.0	0.0	13.6	0.0	14.1	20.4
%ile BackOfQ(50%),veh/ln	4.1	2.4	2.7	2.5	11.9	12.1	1.9	9.0	5.0	2.2	9.5	8.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.6	25.1	25.6	46.3	34.3	34.1	53.5	58.8	44.9	40.6	47.7	43.0
LnGrp LOS	E	C	C	D	C	C	D	E	D	D	D	D
Approach Vol, veh/h		510			1176			576			886	
Approach Delay, s/veh		35.7			36.3			52.9			45.1	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	38.7	13.3	47.0	24.9	24.9	16.3	44.0
Change Period (Y+Rc), s	4.0	5.0	4.0	5.0	5.0	* 5	4.0	5.0
Max Green Setting (Gmax), s	8.0	32.0	10.0	42.0	11.0	* 29	13.0	39.0
Max Q Clear Time (g_c+I1), s	6.1	13.9	9.3	27.1	7.1	18.6	8.0	7.8
Green Ext Time (p_c), s	0.0	2.5	0.0	3.2	0.2	1.2	0.2	1.7

Intersection Summary	
HCM 6th Ctrl Delay	41.7
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	578	2	50	2	0	2	63	252	3	0	122	1006
Future Volume (veh/h)	578	2	50	2	0	2	63	252	3	0	122	1006
Initial Q (Qb), veh	0	0	0	0	0	0	12	12	0	0	0	24
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.95	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1900	1900	1900	1841	1841	1841	0	1856	1856
Adj Flow Rate, veh/h	609	0	19	2	0	0	66	265	2	0	128	700
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	0	0	0	4	4	4	0	3	3
Cap, veh/h	914	0	407	5	0	0	139	867	6	0	594	1608
Arrive On Green	0.27	0.00	0.27	0.00	0.00	0.00	0.05	0.45	0.45	0.00	0.31	0.31
Sat Flow, veh/h	3506	0	1560	1809	0	0	1753	1824	14	0	1856	2768
Grp Volume(v), veh/h	609	0	19	2	0	0	66	0	267	0	128	700
Grp Sat Flow(s),veh/h/ln	1753	0	1560	1810	0	0	1753	0	1837	0	1856	1384
Q Serve(g_s), s	5.3	0.0	0.3	0.0	0.0	0.0	1.3	0.0	3.2	0.0	1.7	4.9
Cycle Q Clear(g_c), s	5.3	0.0	0.3	0.0	0.0	0.0	1.3	0.0	3.2	0.0	1.7	4.9
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.01	0.00		1.00
Lane Grp Cap(c), veh/h	914	0	407	5	0	0	139	0	853	0	594	1608
V/C Ratio(X)	0.67	0.00	0.05	0.39	0.00	0.00	0.47	0.00	0.31	0.00	0.22	0.44
Avail Cap(c_a), veh/h	3080	0	1370	1060	0	0	1027	0	3121	0	1902	3573
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	13.1	0.0	11.0	19.4	0.0	0.0	18.2	0.0	6.3	0.0	9.4	4.9
Incr Delay (d2), s/veh	0.3	0.0	0.0	41.3	0.0	0.0	2.5	0.0	0.2	0.0	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	101.3	0.0	2.1	0.0	0.0	2.8
%ile BackOfQ(50%),veh/ln	1.9	0.0	0.1	0.1	0.0	0.0	5.5	0.0	2.1	0.0	0.6	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.5	0.0	11.0	60.7	0.0	0.0	122.0	0.0	8.6	0.0	9.6	8.0
LnGrp LOS	B	A	B	E	A	A	F	A	A	A	A	A
Approach Vol, veh/h		628			2			333			828	
Approach Delay, s/veh		13.4			60.7			31.1			8.2	
Approach LOS		B			E			C			A	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	4.9	14.1		3.1		19.0		12.1				
Change Period (Y+Rc), s	3.0	3.5		3.0		3.5		3.0				
Max Green Setting (Gmax), s	20.0	35.0		20.0		58.0		30.0				
Max Q Clear Time (g_c+I1), s	3.3	6.9		2.0		5.2		7.3				
Green Ext Time (p_c), s	0.1	3.7		0.0		0.8		1.8				
Intersection Summary												
HCM 6th Ctrl Delay			14.3									
HCM 6th LOS			B									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	152	53	85	650	241	240	59	455	120	109	447	102
Future Volume (vph)	152	53	85	650	241	240	59	455	120	109	447	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
Lane Util. Factor		0.95		0.97	1.00	1.00	1.00	0.95	1.00	0.91	0.91	1.00
Frpb, ped/bikes		0.97		1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	0.96
Flpb, ped/bikes		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		2896		3060	1660	1387	1547	3094	1384	1408	2961	1333
Flt Permitted		0.97		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		2896		3060	1660	1387	1547	3094	1384	1408	2961	1333
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	157	55	88	670	248	247	61	469	124	112	461	105
RTOR Reduction (vph)	0	40	0	0	0	180	0	0	0	0	0	81
Lane Group Flow (vph)	0	260	0	670	248	67	61	469	124	101	472	24
Confl. Peds. (#/hr)			74									5
Confl. Bikes (#/hr)			2			6			4			
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	5%	5%	5%	5%	5%	5%
Turn Type	Split	NA		Split	NA	Perm	Split	NA	custom	Split	NA	Perm
Protected Phases	4	4		7	7		6	6	2 6 7!	2!	2	
Permitted Phases						7						2
Actuated Green, G (s)		20.5		32.4	32.4	32.4	21.0	21.0	90.6	27.4	27.4	27.4
Effective Green, g (s)		20.5		32.4	32.4	32.4	21.0	21.0	90.6	27.4	27.4	27.4
Actuated g/C Ratio		0.17		0.27	0.27	0.27	0.18	0.18	0.75	0.23	0.23	0.23
Clearance Time (s)		4.0		4.9	4.9	4.9	4.9	4.9		4.9	4.9	4.9
Vehicle Extension (s)		3.0		3.0	3.0	3.0	2.5	2.5		2.0	2.0	2.0
Lane Grp Cap (vph)		494		826	448	374	270	541	1044	321	676	304
v/s Ratio Prot		c0.09		c0.22	0.15		0.04	c0.15	0.09	0.07	c0.16	
v/s Ratio Perm						0.05						0.02
v/c Ratio		0.53		0.81	0.55	0.18	0.23	0.87	0.12	0.31	0.70	0.08
Uniform Delay, d1		45.3		40.9	37.6	33.6	42.5	48.1	4.0	38.5	42.5	36.4
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.0		6.1	1.5	0.2	0.3	13.6	0.0	2.6	5.9	0.5
Delay (s)		46.3		47.0	39.1	33.8	42.8	61.7	4.0	41.0	48.4	36.9
Level of Service		D		D	D	C	D	E	A	D	D	D
Approach Delay (s)		46.3			42.5			49.0			45.5	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	45.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.7
Intersection Capacity Utilization	85.1%	ICU Level of Service	E
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	67	215	1526	116	30	60
Future Volume (vph)	67	215	1526	116	30	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9	4.9		4.2	4.2
Lane Util. Factor	1.00	0.91	0.91		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1687	4848	2700		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1687	4848	5023		1770	1583
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	68	219	1557	118	31	61
RTOR Reduction (vph)	0	0	5	0	0	55
Lane Group Flow (vph)	68	219	1670	0	31	6
Confl. Peds. (#/hr)				1		
Confl. Bikes (#/hr)				6		
Heavy Vehicles (%)	7%	7%	2%	2%	2%	2%
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	5	2	6		3	
Permitted Phases						3
Actuated Green, G (s)	8.0	70.9	58.9		9.6	9.6
Effective Green, g (s)	8.0	70.9	58.9		9.6	9.6
Actuated g/C Ratio	0.08	0.71	0.59		0.10	0.10
Clearance Time (s)	4.0	4.9	4.9		4.2	4.2
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	134	3437	1590		169	151
v/s Ratio Prot	c0.04	0.05	c0.62		c0.02	
v/s Ratio Perm						0.00
v/c Ratio	0.51	0.06	1.05		0.18	0.04
Uniform Delay, d1	44.1	4.4	20.6		41.6	41.0
Progression Factor	1.00	1.00	0.79		1.00	1.00
Incremental Delay, d2	1.1	0.0	36.5		0.2	0.0
Delay (s)	45.2	4.5	52.8		41.8	41.1
Level of Service	D	A	D		D	D
Approach Delay (s)		14.1	52.8		41.3	
Approach LOS		B	D		D	

Intersection Summary			
HCM 2000 Control Delay	46.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.1
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBU	EBL	EBT	EBR	WBL2	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	4	49	266	83	30	1255	19	2	837	32	49	8
Future Volume (vph)	4	49	266	83	30	1255	19	2	837	32	49	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.6		4.0	4.6			4.0	4.0	4.0	
Lane Util. Factor		1.00	0.91		1.00	0.91			0.91	0.91	1.00	
Frpb, ped/bikes		1.00	1.00		1.00	1.00			1.00	1.00	0.94	
Flpb, ped/bikes		1.00	1.00		1.00	1.00			1.00	1.00	1.00	
Frt		1.00	0.96		1.00	1.00			1.00	1.00	0.85	
Flt Protected		0.95	1.00		0.95	1.00			0.95	0.96	1.00	
Satd. Flow (prot)		1597	4413		1770	5070			3189	1607	1480	
Flt Permitted		0.28	1.00		0.95	1.00			0.95	0.96	1.00	
Satd. Flow (perm)		467	4413		1770	5070			3189	1607	1480	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	4	51	277	86	31	1307	20	2	872	33	51	8
RTOR Reduction (vph)	0	0	0	0	0	1	0	0	0	0	39	0
Lane Group Flow (vph)	0	55	363	0	31	1326	0	0	604	303	12	0
Confl. Peds. (#/hr)							8				37	
Confl. Bikes (#/hr)				2			5				4	
Heavy Vehicles (%)	13%	13%	13%	13%	2%	2%	2%	3%	3%	3%	3%	1%
Turn Type	custom	Prot	NA		Prot	NA		Split	Split	NA	Perm	Split
Protected Phases		1	6		5	2		4	4	4		7
Permitted Phases	1										4	
Actuated Green, G (s)		14.4	47.9		4.4	37.9			29.5	29.5	29.5	
Effective Green, g (s)		14.4	47.9		4.4	37.9			29.5	29.5	29.5	
Actuated g/C Ratio		0.11	0.37		0.03	0.29			0.23	0.23	0.23	
Clearance Time (s)		4.0	4.6		4.0	4.6			4.0	4.0	4.0	
Vehicle Extension (s)		2.0	3.0		2.0	3.0			2.0	2.0	2.0	
Lane Grp Cap (vph)		51	1619		59	1472			720	363	334	
v/s Ratio Prot			0.08		0.02	c0.26			c0.19	0.19		
v/s Ratio Perm		c0.12									0.01	
v/c Ratio		1.08	0.22		0.53	0.90			0.84	0.83	0.03	
Uniform Delay, d1		58.0	28.5		62.0	44.5			48.2	48.2	39.4	
Progression Factor		1.00	1.00		1.00	1.00			1.00	1.00	1.00	
Incremental Delay, d2		149.7	0.1		3.8	7.9			8.1	14.5	0.0	
Delay (s)		207.8	28.6		65.9	52.4			56.4	62.7	39.4	
Level of Service		F	C		E	D			E	E	D	
Approach Delay (s)			52.1			52.7				57.5		
Approach LOS			D			D				E		

Intersection Summary			
HCM 2000 Control Delay	54.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	130.5	Sum of lost time (s)	21.1
Intersection Capacity Utilization	97.2%	ICU Level of Service	F
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

Movement	SBT	SBR2	NER	NER2
Lane Configurations				
Traffic Volume (vph)	27	431	120	72
Future Volume (vph)	27	431	120	72
Ideal Flow (vphpl)	1900	1900	1990	1900
Total Lost time (s)	4.0		4.5	4.5
Lane Util. Factor	0.95		*0.95	1.00
Frpb, ped/bikes	0.97		1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00
Frt	0.86		1.00	0.85
Flt Protected	1.00		1.00	1.00
Satd. Flow (prot)	2969		3376	1442
Flt Permitted	1.00		1.00	1.00
Satd. Flow (perm)	2969		3376	1442
Peak-hour factor, PHF	0.96	0.96	0.96	0.96
Adj. Flow (vph)	28	449	125	75
RTOR Reduction (vph)	372	0	0	0
Lane Group Flow (vph)	113	0	125	75
Confl. Peds. (#/hr)				54
Confl. Bikes (#/hr)		8		
Heavy Vehicles (%)	1%	1%	12%	12%
Turn Type	NA		Prot	Prot
Protected Phases	7		3	3
Permitted Phases				
Actuated Green, G (s)	9.1		18.5	18.5
Effective Green, g (s)	9.1		18.5	18.5
Actuated g/C Ratio	0.07		0.14	0.14
Clearance Time (s)	4.0		4.5	4.5
Vehicle Extension (s)	2.0		2.0	2.0
Lane Grp Cap (vph)	207		478	204
v/s Ratio Prot	c0.04		0.04	c0.05
v/s Ratio Perm				
v/c Ratio	0.93dr		0.26	0.37
Uniform Delay, d1	58.7		49.9	50.7
Progression Factor	1.00		1.00	1.00
Incremental Delay, d2	1.6		0.1	0.4
Delay (s)	60.3		50.0	51.1
Level of Service	E		D	D
Approach Delay (s)	60.3			
Approach LOS	E			

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	105	1	0	682	48	3	1	0	17	0	268
Future Volume (vph)	68	105	1	0	682	48	3	1	0	17	0	268
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0			4.0	4.0
Lane Util. Factor	1.00	0.95			0.95			1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	1.00
Frt	1.00	1.00			0.99			1.00			1.00	0.85
Flt Protected	0.95	1.00			1.00			0.96			0.95	1.00
Satd. Flow (prot)	1492	2979			3273			1831			1719	1538
Flt Permitted	0.95	1.00			1.00			0.66			0.76	1.00
Satd. Flow (perm)	1492	2979			3273			1252			1366	1538
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	73	113	1	0	733	52	3	1	0	18	0	288
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	0	0	0	258
Lane Group Flow (vph)	73	113	0	0	785	0	0	4	0	0	18	30
Confl. Peds. (#/hr)			1			2						
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	21%	21%	21%	9%	9%	9%	0%	0%	0%	5%	5%	5%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			3			4	
Permitted Phases							3			4		4
Actuated Green, G (s)	7.2	35.7			24.5			19.9			7.8	7.8
Effective Green, g (s)	7.2	35.7			24.5			19.9			7.8	7.8
Actuated g/C Ratio	0.10	0.47			0.32			0.26			0.10	0.10
Clearance Time (s)	4.0	4.0			4.0			4.0			4.0	4.0
Vehicle Extension (s)	2.0	2.5			2.5			2.0			2.0	2.0
Lane Grp Cap (vph)	142	1410			1063			330			141	159
v/s Ratio Prot	c0.05	0.04			c0.24							
v/s Ratio Perm								c0.00			0.01	c0.02
v/c Ratio	0.51	0.08			0.74			0.01			0.13	0.19
Uniform Delay, d1	32.4	10.9			22.6			20.5			30.7	30.9
Progression Factor	1.00	1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2	1.3	0.0			2.6			0.1			0.1	0.2
Delay (s)	33.7	10.9			25.2			20.6			30.9	31.1
Level of Service	C	B			C			C			C	C
Approach Delay (s)		19.8			25.2			20.6			31.1	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	25.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	75.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	50.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Intersection Delay, s/veh	197.2
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	910	144	211	249	10	57	16	135	9	7	25
Future Vol, veh/h	21	910	144	211	249	10	57	16	135	9	7	25
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles, %	4	4	4	10	10	10	16	16	16	50	50	50
Mvmt Flow	22	968	153	224	265	11	61	17	144	10	7	27
Number of Lanes	0	1	1	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	318.3	17.2	14.2	14.2
HCM LOS	F	C	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	78%	0%	2%	0%	100%	0%	22%
Vol Thru, %	22%	0%	98%	0%	0%	96%	17%
Vol Right, %	0%	100%	0%	100%	0%	4%	61%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	73	135	931	144	211	259	41
LT Vol	57	0	21	0	211	0	9
Through Vol	16	0	910	0	0	249	7
RT Vol	0	135	0	144	0	10	25
Lane Flow Rate	78	144	990	153	224	276	44
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.178	0.286	1.761	0.242	0.447	0.508	0.105
Departure Headway (Hd)	9.37	8.238	6.402	5.678	7.957	7.416	10.009
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	385	439	574	633	456	490	360
Service Time	7.07	5.938	4.132	3.409	5.657	5.116	8.009
HCM Lane V/C Ratio	0.203	0.328	1.725	0.242	0.491	0.563	0.122
HCM Control Delay	14.1	14.2	365.9	10.2	16.9	17.5	14.2
HCM Lane LOS	B	B	F	B	C	C	B
HCM 95th-tile Q	0.6	1.2	59.5	0.9	2.3	2.8	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	0	43	14	0	44	42	571	3	52	1077	271
Future Volume (veh/h)	60	0	43	14	0	44	42	571	3	52	1077	271
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.96		0.96	0.96		0.96	1.00		0.96	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1781	1781	1781	1796	1796	1796	1767	1767	1767
Adj Flow Rate, veh/h	61	0	6	14	0	6	42	577	3	53	1088	258
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	5	5	5	8	8	8	7	7	7	9	9	9
Cap, veh/h	282	0	215	278	0	209	106	2094	11	120	1630	384
Arrive On Green	0.14	0.00	0.14	0.14	0.00	0.14	0.06	0.60	0.60	0.07	0.61	0.61
Sat Flow, veh/h	1323	0	1486	1291	0	1450	1711	3480	18	1682	2670	628
Grp Volume(v), veh/h	61	0	6	14	0	6	42	283	297	53	681	665
Grp Sat Flow(s),veh/h/ln	1323	0	1486	1291	0	1450	1711	1706	1792	1682	1678	1620
Q Serve(g_s), s	3.1	0.0	0.3	0.7	0.0	0.3	1.8	5.9	5.9	2.3	19.9	20.3
Cycle Q Clear(g_c), s	3.4	0.0	0.3	1.0	0.0	0.3	1.8	5.9	5.9	2.3	19.9	20.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.01	1.00		0.39
Lane Grp Cap(c), veh/h	282	0	215	278	0	209	106	1027	1078	120	1025	989
V/C Ratio(X)	0.22	0.00	0.03	0.05	0.00	0.03	0.39	0.28	0.28	0.44	0.66	0.67
Avail Cap(c_a), veh/h	619	0	593	606	0	578	237	1027	1078	233	1025	989
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.83	0.83	0.83
Uniform Delay (d), s/veh	29.0	0.0	27.6	28.0	0.0	27.6	33.8	7.1	7.1	33.4	9.6	9.6
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.0	0.0	0.0	0.9	0.7	0.6	0.8	2.8	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.1	0.2	0.0	0.1	0.7	2.0	2.1	0.9	6.8	6.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.2	0.0	27.6	28.0	0.0	27.6	34.7	7.8	7.8	34.2	12.4	12.7
LnGrp LOS	C	A	C	C	A	C	C	A	A	C	B	B
Approach Vol, veh/h		67			20			622			1399	
Approach Delay, s/veh		29.0			27.9			9.6			13.4	
Approach LOS		C			C			A			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.3	50.2		15.4	8.7	50.9		15.4
Change Period (Y+Rc), s	4.0	5.1		4.6	4.0	5.1		4.6
Max Green Setting (Gmax), s	10.4	21.0		29.9	10.4	21.0		29.9
Max Q Clear Time (g_c+I1), s	4.3	7.9		5.4	3.8	22.3		3.0
Green Ext Time (p_c), s	0.0	2.0		0.1	0.0	0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	12.9
HCM 6th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	2081	133	16	822	240	694
Future Volume (veh/h)	2081	133	16	822	240	694
Initial Q (Qb), veh	45	0	0	0	10	51
Ped-Bike Adj(A_pbT)		0.95	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1707	1707	1811	1811
Adj Flow Rate, veh/h	2102	128	16	830	242	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	4	4	13	13	6	6
Cap, veh/h	3199	168	35	3378	317	
Arrive On Green	0.23	0.23	0.02	0.76	0.16	0.00
Sat Flow, veh/h	4995	292	1626	4815	1725	2701
Grp Volume(v), veh/h	1453	777	16	830	242	0
Grp Sat Flow(s),veh/h/ln	1675	1771	1626	1554	1725	1351
Q Serve(g_s), s	39.0	39.5	1.0	5.3	13.6	0.0
Cycle Q Clear(g_c), s	39.0	39.5	1.0	5.3	13.6	0.0
Prop In Lane		0.16	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2195	1174	35	3378	317	
V/C Ratio(X)	0.66	0.66	0.46	0.25	0.76	
Avail Cap(c_a), veh/h	2326	1230	130	3523	517	
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.84	0.95	0.95	1.00	0.00
Uniform Delay (d), s/veh	30.8	30.5	48.3	4.8	39.8	0.0
Incr Delay (d2), s/veh	1.3	2.5	3.3	0.2	3.8	0.0
Initial Q Delay(d3),s/veh	4.0	3.5	0.0	0.0	30.2	0.0
%ile BackOfQ(50%),veh/ln	21.2	22.7	0.4	1.7	9.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	36.2	36.5	51.6	5.0	73.9	0.0
LnGrp LOS	D	D	D	A	E	
Approach Vol, veh/h	2230			846	242	A
Approach Delay, s/veh	36.3			5.9	73.9	
Approach LOS	D			A	E	

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.2	73.4				79.6		20.4
Change Period (Y+Rc), s	4.0	4.0				4.0		4.0
Max Green Setting (Gmax), s	8.0	50.0				62.0		30.0
Max Q Clear Time (g_c+I1), s	3.0	41.5				7.3		15.6
Green Ext Time (p_c), s	0.0	6.3				4.3		0.8

Intersection Summary			
HCM 6th Ctrl Delay			31.3
HCM 6th LOS			C

Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	163	2325	287	531	546	104	115	156	738	265	168	110
Future Volume (veh/h)	163	2325	287	531	546	104	115	156	738	265	168	110
Initial Q (Qb), veh	5	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1633	1633	1633	1752	1752	1752	1767	1767	1767
Adj Flow Rate, veh/h	165	2348	204	536	552	90	116	158	0	268	170	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	4	4	4	18	18	18	10	10	10	9	9	9
Cap, veh/h	204	2832	853	302	2000	320	154	195		179	420	
Arrive On Green	0.11	0.56	0.56	0.10	0.56	0.56	0.09	0.11	0.00	0.11	0.13	0.00
Sat Flow, veh/h	1753	5025	1514	3018	3862	618	1668	1752	1485	1682	3357	1497
Grp Volume(v), veh/h	165	2348	204	536	422	220	116	158	0	268	170	0
Grp Sat Flow(s),veh/h/ln	1753	1675	1514	1509	1486	1507	1668	1752	1485	1682	1678	1497
Q Serve(g_s), s	13.9	57.4	10.2	15.0	11.0	11.3	10.2	13.2	0.0	16.0	7.0	0.0
Cycle Q Clear(g_c), s	13.9	57.4	10.2	15.0	11.0	11.3	10.2	13.2	0.0	16.0	7.0	0.0
Prop In Lane	1.00		1.00	1.00		0.41	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	204	2832	853	302	1540	780	154	195		179	420	
V/C Ratio(X)	0.81	0.83	0.24	1.78	0.27	0.28	0.75	0.81		1.49	0.40	
Avail Cap(c_a), veh/h	280	2832	853	302	1653	838	200	445		179	815	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.59	0.59	0.59	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	65.5	26.8	16.5	67.5	20.4	20.4	66.4	65.1	0.0	67.0	60.5	0.0
Incr Delay (d2), s/veh	5.0	1.8	0.4	362.5	0.4	0.9	7.5	3.1	0.0	249.1	0.2	0.0
Initial Q Delay(d3),s/veh	22.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.6	22.9	3.6	21.0	4.3	4.6	4.6	6.1	0.0	19.3	3.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	93.0	28.6	16.9	430.0	20.8	21.3	73.8	68.2	0.0	316.1	60.7	0.0
LnGrp LOS	F	C	B	F	C	C	E	E		F	E	
Approach Vol, veh/h		2717			1178			274	A		438	A
Approach Delay, s/veh		31.6			207.1			70.6			216.9	
Approach LOS		C			F			E			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.0	89.4	17.9	23.7	20.1	88.3	20.0	21.6				
Change Period (Y+Rc), s	4.0	4.9	4.0	* 4.9	4.0	4.9	4.0	4.9				
Max Green Setting (Gmax), s	15.0	63.1	18.0	* 36	24.0	54.1	16.0	38.1				
Max Q Clear Time (g_c+I1), s	17.0	59.4	12.2	9.0	15.9	13.3	18.0	15.2				
Green Ext Time (p_c), s	0.0	3.2	0.1	0.6	0.2	2.9	0.0	0.5				

Intersection Summary		
HCM 6th Ctrl Delay		96.4
HCM 6th LOS		F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	156	366	456	37	417	30	466	1030	1265	22	116	653
Future Volume (veh/h)	156	366	456	37	417	30	466	1030	1265	22	116	653
Initial Q (Qb), veh	0	13	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		1.00	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1722	1722	1722	1574	1574	1574	1811	1811	1811	1663	1663	1663
Adj Flow Rate, veh/h	158	370	90	37	421	3	471	1040	0	22	117	266
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	12	12	12	22	22	22	6	6	6	16	16	16
Cap, veh/h	493	410	592	94	603	181	1285	1321		226	237	339
Arrive On Green	0.05	0.08	0.08	0.06	0.14	0.14	0.39	0.39	0.00	0.14	0.14	0.14
Sat Flow, veh/h	3182	1722	2485	1499	4297	1288	3346	3532	0	1584	1663	2375
Grp Volume(v), veh/h	158	370	90	37	421	3	471	1040	0	22	117	266
Grp Sat Flow(s),veh/h/ln	1591	1722	1242	1499	1432	1288	1673	1721	0	1584	1663	1188
Q Serve(g_s), s	5.0	22.4	3.6	2.5	9.8	0.2	10.5	27.8	0.0	1.3	6.8	11.4
Cycle Q Clear(g_c), s	5.0	22.4	3.6	2.5	9.8	0.2	10.5	27.8	0.0	1.3	6.8	11.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	493	410	592	94	603	181	1285	1321		226	237	339
V/C Ratio(X)	0.32	0.90	0.15	0.39	0.70	0.02	0.37	0.79		0.10	0.49	0.78
Avail Cap(c_a), veh/h	480	410	592	143	1023	307	1298	1335		347	364	520
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.63	0.63	0.63	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.5	48.4	38.5	47.3	43.0	38.9	23.2	28.6	0.0	39.1	41.5	43.5
Incr Delay (d2), s/veh	0.1	15.7	0.1	1.0	0.6	0.0	0.8	4.8	0.0	0.1	0.6	1.9
Initial Q Delay(d3),s/veh	0.0	70.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	21.3	1.1	1.0	3.5	0.1	4.2	11.9	0.0	0.5	2.8	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.6	134.3	38.5	48.3	43.6	38.9	24.0	33.4	0.0	39.2	42.1	45.4
LnGrp LOS	D	F	D	D	D	D	C	C		D	D	D
Approach Vol, veh/h		618			461			1511	A		405	
Approach Delay, s/veh		97.4			43.9			30.4			44.1	
Approach LOS		F			D			C			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.6	29.2		45.3	20.5	19.3		19.9
Change Period (Y+Rc), s	4.0	4.6		4.6	4.6	* 4.6		4.9
Max Green Setting (Gmax), s	10.0	25.0		28.9	10.0	* 25		23.0
Max Q Clear Time (g_c+I1), s	4.5	24.4		29.8	7.0	11.8		13.4
Green Ext Time (p_c), s	0.0	0.2		0.0	0.1	1.6		1.0

Intersection Summary	
HCM 6th Ctrl Delay	48.2
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	122	289	149	1020	261	282	192	46	520	202	782	99
Future Volume (veh/h)	122	289	149	1020	261	282	192	46	520	202	782	99
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1441	1441	1441	1618	1618	1618	1796	1796	1796	1811	1811	1811
Adj Flow Rate, veh/h	123	292	0	1030	264	0	194	46	0	204	790	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	31	31	31	19	19	19	7	7	7	6	6	6
Cap, veh/h	180	378		1093	407		196	453		524	1138	
Arrive On Green	0.13	0.13	0.00	0.08	0.08	0.00	0.11	0.13	0.00	0.30	0.33	0.00
Sat Flow, veh/h	1372	2881	1221	4347	1618	1372	1711	3413	1522	1725	3441	1535
Grp Volume(v), veh/h	123	292	0	1030	264	0	194	46	0	204	790	0
Grp Sat Flow(s),veh/h/ln	1372	1441	1221	1449	1618	1372	1711	1706	1522	1725	1721	1535
Q Serve(g_s), s	9.0	10.3	0.0	24.8	16.6	0.0	11.9	1.2	0.0	9.8	20.9	0.0
Cycle Q Clear(g_c), s	9.0	10.3	0.0	24.8	16.6	0.0	11.9	1.2	0.0	9.8	20.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	180	378		1093	407		196	453		524	1138	
V/C Ratio(X)	0.68	0.77		0.94	0.65		0.99	0.10		0.39	0.69	
Avail Cap(c_a), veh/h	287	604		1093	407		196	686		524	1138	
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.70	0.70	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	43.5	44.1	0.0	47.4	43.7	0.0	46.5	40.0	0.0	28.9	30.5	0.0
Incr Delay (d2), s/veh	1.7	1.3	0.0	11.8	2.5	0.0	61.9	0.0	0.0	0.2	3.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	3.7	0.0	10.8	7.5	0.0	8.3	0.5	0.0	4.0	9.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.2	45.4	0.0	59.2	46.2	0.0	108.4	40.1	0.0	29.1	34.0	0.0
LnGrp LOS	D	D		E	D		F	D		C	C	
Approach Vol, veh/h		415	A		1294	A		240	A		994	A
Approach Delay, s/veh		45.3			56.5			95.3			33.0	
Approach LOS		D			E			F			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	16.0	39.6		18.4	36.8	18.8		31.0
Change Period (Y+Rc), s	4.0	4.9		4.6	4.9	* 4.9		4.6
Max Green Setting (Gmax), s	12.0	26.5		22.0	17.4	* 21		26.4
Max Q Clear Time (g_c+I1), s	13.9	22.9		12.3	11.8	3.2		26.8
Green Ext Time (p_c), s	0.0	1.8		1.1	0.2	0.1		0.0

Intersection Summary	
HCM 6th Ctrl Delay	50.2
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	0	6	3	0	25	18	675	5	52	1419	45
Future Volume (veh/h)	25	0	6	3	0	25	18	675	5	52	1419	45
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.95		1.00	0.95		1.00	1.00		0.96	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1752	1752	1752	1500	1500	1500	1707	1707	1707	1796	1796	1796
Adj Flow Rate, veh/h	25	0	0	3	0	0	18	682	5	53	1433	44
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	10	10	10	27	27	27	13	13	13	7	7	7
Cap, veh/h	263	0	193	244	0	0	27	2180	16	66	2304	71
Arrive On Green	0.13	0.00	0.00	0.13	0.00	0.00	0.02	0.66	0.66	0.04	0.68	0.68
Sat Flow, veh/h	1266	0	1485	1119	0	0	1626	3300	24	1711	3376	103
Grp Volume(v), veh/h	25	0	0	3	0	0	18	335	352	53	723	754
Grp Sat Flow(s),veh/h/ln	1266	0	1485	1119	0	0	1626	1622	1702	1711	1706	1773
Q Serve(g_s), s	1.1	0.0	0.0	0.0	0.0	0.0	0.8	6.5	6.5	2.3	17.1	17.2
Cycle Q Clear(g_c), s	1.3	0.0	0.0	0.1	0.0	0.0	0.8	6.5	6.5	2.3	17.1	17.2
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.01	1.00		0.06
Lane Grp Cap(c), veh/h	263	0	193	244	0	0	27	1071	1124	66	1165	1210
V/C Ratio(X)	0.10	0.00	0.00	0.01	0.00	0.00	0.66	0.31	0.31	0.80	0.62	0.62
Avail Cap(c_a), veh/h	512	0	486	458	0	0	533	1071	1124	560	1165	1210
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.2	0.0	0.0	27.8	0.0	0.0	35.8	5.3	5.3	34.9	6.4	6.4
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.0	0.0	0.0	9.7	0.8	0.7	8.0	2.5	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	0.0	0.0	0.0	0.4	1.9	2.0	1.1	5.3	5.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.3	0.0	0.0	27.8	0.0	0.0	45.5	6.1	6.0	42.9	8.9	8.8
LnGrp LOS	C	A	A	C	A	A	D	A	A	D	A	A
Approach Vol, veh/h		25			3			705			1530	
Approach Delay, s/veh		28.3			27.8			7.1			10.1	
Approach LOS		C			C			A			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.8	52.9		13.5	5.2	54.5		13.5				
Change Period (Y+Rc), s	4.0	4.5		4.0	4.0	4.5		4.0				
Max Green Setting (Gmax), s	24.0	30.0		24.0	24.0	50.0		24.0				
Max Q Clear Time (g_c+I1), s	4.3	8.5		3.3	2.8	19.2		2.1				
Green Ext Time (p_c), s	0.0	2.8		0.0	0.0	8.6		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			9.4									
HCM 6th LOS			A									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	501	1975	642	452	220	748	226	64	1139	0	0	0
Future Volume (veh/h)	501	1975	642	452	220	748	226	64	1139	0	0	0
Initial Q (Qb), veh	16	8	16	0	0	0	0	0	10			
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	1870	1648	1648	1648	1856	1856	1856			
Adj Flow Rate, veh/h	506	1995	446	457	222	285	228	65	1151			
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99			
Percent Heavy Veh, %	2	2	2	17	17	17	3	3	3			
Cap, veh/h	642	1949	805	386	731	1090	805	828	1000			
Arrive On Green	0.17	0.52	0.52	0.13	0.48	0.48	0.23	0.23	0.23			
Sat Flow, veh/h	3563	3741	1545	3045	1648	2458	3428	3526	2768			
Grp Volume(v), veh/h	506	1995	446	457	222	285	228	65	1151			
Grp Sat Flow(s),veh/h/ln	1781	1870	1545	1522	1648	1229	1714	1763	1384			
Q Serve(g_s), s	14.7	55.5	20.7	13.5	8.6	7.3	5.8	1.5	25.0			
Cycle Q Clear(g_c), s	14.7	55.5	20.7	13.5	8.6	7.3	5.8	1.5	25.0			
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	642	1949	805	386	731	1090	805	828	1000			
V/C Ratio(X)	0.79	1.02	0.55	1.18	0.30	0.26	0.28	0.08	1.15			
Avail Cap(c_a), veh/h	789	1949	805	386	791	1180	805	828	1000			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	42.6	25.5	18.7	46.5	19.1	18.7	33.4	31.8	34.0			
Incr Delay (d2), s/veh	4.0	26.5	1.1	106.2	0.3	0.2	0.1	0.0	79.4			
Initial Q Delay(d3),s/veh	21.2	14.8	6.4	0.0	0.0	0.0	0.0	0.0	36.0			
%ile BackOfQ(50%),veh/ln	9.6	34.6	11.0	10.8	3.6	2.3	2.4	0.7	40.3			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.8	66.8	26.1	152.7	19.4	18.9	33.5	31.8	149.4			
LnGrp LOS	E	F	C	F	B	B	C	C	F			
Approach Vol, veh/h		2947			964			1444				
Approach Delay, s/veh		60.8			82.4			125.8				
Approach LOS		E			F			F				

Timer - Assigned Phs	1	2		4	5	6			
Phs Duration (G+Y+Rc), s	17.0	60.5		29.0	21.4	56.1			
Change Period (Y+Rc), s	3.5	5.0		4.0	3.5	5.0			
Max Green Setting (Gmax), s	13.5	55.5		25.0	23.6	45.4			
Max Q Clear Time (g_c+I1), s	15.5	57.5		27.0	16.7	10.6			
Green Ext Time (p_c), s	0.0	0.0		0.0	1.2	5.4			

Intersection Summary			
HCM 6th Ctrl Delay			82.2
HCM 6th LOS			F

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	1716	38	105	179	162	23	205	585	817	328	211
Future Volume (veh/h)	142	1716	38	105	179	162	23	205	585	817	328	211
Initial Q (Qb), veh	0	50	0	0	0	0	0	0	12	24	24	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1826	1826	1826	1870	1870	1870	1826	1826	1826
Adj Flow Rate, veh/h	143	1733	35	106	181	39	23	207	591	825	331	61
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	1	1	5	5	5	2	2	2	5	5	5
Cap, veh/h	180	1912	12	661	1343	283	80	274	641	919	523	435
Arrive On Green	0.10	0.36	0.36	0.07	0.35	0.35	0.05	0.14	0.14	0.19	0.28	0.28
Sat Flow, veh/h	1795	5190	105	3374	2851	601	1781	1870	2790	4904	1826	1505
Grp Volume(v), veh/h	143	1146	622	106	109	111	23	207	591	825	331	61
Grp Sat Flow(s),veh/h/ln	1795	1716	1863	1687	1735	1718	1781	1870	1395	1635	1826	1505
Q Serve(g_s), s	6.2	25.6	25.6	2.4	3.5	3.6	1.0	8.6	8.3	13.1	12.7	2.4
Cycle Q Clear(g_c), s	6.2	25.6	25.6	2.4	3.5	3.6	1.0	8.6	8.3	13.1	12.7	2.4
Prop In Lane	1.00		0.06	1.00		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	180	1244	681	661	817	809	80	274	641	919	523	435
V/C Ratio(X)	0.80	0.92	0.91	0.16	0.13	0.14	0.29	0.75	0.92	0.90	0.63	0.14
Avail Cap(c_a), veh/h	292	1244	675	253	606	600	200	281	625	919	513	423
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.97	0.97	0.97	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.2	25.5	25.5	26.9	12.2	12.2	37.0	32.8	16.3	32.5	26.7	21.1
Incr Delay (d2), s/veh	3.1	12.5	18.9	0.0	0.3	0.3	0.7	9.6	19.3	11.2	2.0	0.1
Initial Q Delay(d3),s/veh	0.0	60.9	49.6	0.0	0.0	0.0	0.0	0.0	32.6	47.7	41.4	0.0
%ile BackOfQ(50%),veh/ln	2.8	23.9	25.2	0.8	1.0	1.1	0.4	4.4	7.1	10.7	13.6	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.3	98.9	94.0	27.0	12.5	12.6	37.7	42.4	68.3	91.4	70.1	21.1
LnGrp LOS	D	F	F	C	B	B	D	D	E	F	E	C
Approach Vol, veh/h		1911			326			821			1217	
Approach Delay, s/veh		92.8			17.2			60.9			82.1	
Approach LOS		F			B			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.6	27.5	12.0	32.9	19.0	16.1	10.9	34.0
Change Period (Y+Rc), s	4.0	5.0	4.0	5.0	4.0	5.0	5.0	* 5
Max Green Setting (Gmax), s	9.0	18.0	13.0	22.0	15.0	12.0	6.0	* 29
Max Q Clear Time (g_c+I1), s	3.0	14.7	8.2	5.6	15.1	10.6	4.4	27.6
Green Ext Time (p_c), s	0.0	0.5	0.1	0.6	0.0	0.5	0.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	77.9
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

User approved changes to right turn type.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1315	2	74	1	0	5	40	109	3	2	150	942
Future Volume (veh/h)	1315	2	74	1	0	5	40	109	3	2	150	942
Initial Q (Qb), veh	24	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1411	1411	1411	1781	1781	1781	1767	1767	1767
Adj Flow Rate, veh/h	1328	2	34	1	0	0	40	110	2	2	152	666
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	3	3	3	33	33	33	8	8	8	9	9	9
Cap, veh/h	1720	44	751	3	0	0	58	531	10	75	369	1876
Arrive On Green	0.48	0.48	0.48	0.00	0.00	0.00	0.03	0.32	0.32	0.22	0.22	0.22
Sat Flow, veh/h	3428	88	1498	1344	0	0	1697	1743	32	6	1758	2635
Grp Volume(v), veh/h	1328	0	36	1	0	0	40	0	112	154	0	666
Grp Sat Flow(s),veh/h/ln	1714	0	1586	1344	0	0	1697	0	1774	1764	0	1317
Q Serve(g_s), s	15.5	0.0	0.6	0.0	0.0	0.0	1.1	0.0	2.2	0.0	0.0	4.8
Cycle Q Clear(g_c), s	15.5	0.0	0.6	0.0	0.0	0.0	1.1	0.0	2.2	3.5	0.0	4.8
Prop In Lane	1.00		0.94	1.00		0.00	1.00		0.02	0.01		1.00
Lane Grp Cap(c), veh/h	1720	0	796	3	0	0	58	0	541	444	0	1876
V/C Ratio(X)	0.77	0.00	0.05	0.37	0.00	0.00	0.69	0.00	0.21	0.35	0.00	0.36
Avail Cap(c_a), veh/h	4794	0	2218	199	0	0	216	0	1316	1046	0	2722
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.7	0.0	6.3	25.7	0.0	0.0	24.6	0.0	13.6	17.9	0.0	2.7
Incr Delay (d2), s/veh	0.3	0.0	0.0	67.0	0.0	0.0	13.7	0.0	0.1	0.5	0.0	0.1
Initial Q Delay(d3),s/veh	6.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.2	0.0	0.1	0.1	0.0	0.0	0.7	0.0	0.9	1.5	0.0	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.1	0.0	6.3	92.7	0.0	0.0	38.3	0.0	13.8	18.3	0.0	2.9
LnGrp LOS	B	A	A	F	A	A	D	A	B	B	A	A
Approach Vol, veh/h		1364			1			152			820	
Approach Delay, s/veh		16.8			92.7			20.2			5.8	
Approach LOS		B			F			C			A	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	4.6	13.8		3.1		18.4		25.8				
Change Period (Y+Rc), s	3.0	3.5		3.0		3.5		3.0				
Max Green Setting (Gmax), s	6.0	26.0		7.0		35.0		66.0				
Max Q Clear Time (g_c+I1), s	3.1	6.8		2.0		4.2		17.5				
Green Ext Time (p_c), s	0.0	3.5		0.0		0.3		5.3				
Intersection Summary												
HCM 6th Ctrl Delay			13.2									
HCM 6th LOS			B									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	186	292	119	430	191	146	35	434	469	1478	556	124
Future Volume (vph)	186	292	119	430	191	146	35	434	469	1478	556	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
Lane Util. Factor	1.00	1.00		0.97	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.97		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1593	1563		2814	1527	1298	1464	2927	1309	3030	3124	1281
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1593	1563		2814	1527	1298	1464	2927	1309	3030	3124	1281
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	188	295	120	434	193	147	35	438	474	1493	562	125
RTOR Reduction (vph)	0	14	0	0	0	129	0	0	0	0	0	83
Lane Group Flow (vph)	188	401	0	434	193	18	35	438	474	1493	562	42
Confl. Peds. (#/hr)			58									20
Confl. Bikes (#/hr)			9						3			3
Heavy Vehicles (%)	2%	2%	2%	12%	12%	12%	11%	11%	11%	4%	4%	4%
Turn Type	Split	NA		Split	NA	Perm	Split	NA	custom	Split	NA	Perm
Protected Phases	4	4		7	7		6	6	2 6 7!	2!	2	
Permitted Phases						7						2
Actuated Green, G (s)	26.0	26.0		13.1	13.1	13.1	12.1	12.1	70.1	35.1	35.1	35.1
Effective Green, g (s)	26.0	26.0		13.1	13.1	13.1	12.1	12.1	70.1	35.1	35.1	35.1
Actuated g/C Ratio	0.25	0.25		0.12	0.12	0.12	0.12	0.12	0.67	0.33	0.33	0.33
Clearance Time (s)	4.0	4.0		4.9	4.9	4.9	4.9	4.9		4.9	4.9	4.9
Vehicle Extension (s)	2.0	2.0		3.0	3.0	3.0	2.5	2.5		2.0	2.0	2.0
Lane Grp Cap (vph)	394	387		351	190	161	168	337	873	1012	1044	428
v/s Ratio Prot	0.12	c0.26		c0.15	0.13		0.02	c0.15	0.36	c0.49	0.18	
v/s Ratio Perm						0.01						0.03
v/c Ratio	0.48	1.04		1.24	1.02	0.11	0.21	1.30	0.54	1.48	0.54	0.10
Uniform Delay, d1	33.7	39.5		46.0	46.0	40.8	42.1	46.5	9.1	35.0	28.4	24.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	55.2		128.6	69.5	0.3	0.5	155.0	0.5	219.3	2.0	0.5
Delay (s)	34.0	94.7		174.5	115.4	41.1	42.6	201.5	9.6	254.2	30.4	24.5
Level of Service	C	F		F	F	D	D	F	A	F	C	C
Approach Delay (s)		75.8			134.5			99.6			183.3	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	142.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.28		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	18.7
Intersection Capacity Utilization	117.0%	ICU Level of Service	H
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	108	2159	1020	42	55	43
Future Volume (vph)	108	2159	1020	42	55	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9	4.9		4.2	4.2
Lane Util. Factor	1.00	0.91	0.91		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1736	4988	4563		1703	1524
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1736	4988	4563		1703	1524
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	109	2181	1030	42	56	43
RTOR Reduction (vph)	0	0	2	0	0	39
Lane Group Flow (vph)	109	2181	1070	0	56	4
Heavy Vehicles (%)	4%	4%	13%	13%	6%	6%
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	5	2	6		3	
Permitted Phases						3
Actuated Green, G (s)	10.1	81.3	67.2		9.6	9.6
Effective Green, g (s)	10.1	81.3	67.2		9.6	9.6
Actuated g/C Ratio	0.10	0.81	0.67		0.10	0.10
Clearance Time (s)	4.0	4.9	4.9		4.2	4.2
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	175	4055	3066		163	146
v/s Ratio Prot	c0.06	c0.44	0.23		c0.03	
v/s Ratio Perm						0.00
v/c Ratio	0.62	0.54	0.35		0.34	0.03
Uniform Delay, d1	43.1	3.1	7.0		42.3	41.0
Progression Factor	1.00	1.00	1.15		1.00	1.00
Incremental Delay, d2	4.9	0.5	0.3		0.5	0.0
Delay (s)	48.0	3.6	8.4		42.7	41.0
Level of Service	D	A	A		D	D
Approach Delay (s)		5.7	8.4		42.0	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	7.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.1
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBU	EBL	EBT	EBR	WBL2	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	1	321	2016	776	48	887	21	496	92	127	10	16
Future Volume (vph)	1	321	2016	776	48	887	21	496	92	127	10	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.6		4.0	4.6		4.0	4.0	4.0		4.0
Lane Util. Factor		1.00	0.91		1.00	0.91		0.91	0.91	1.00		0.95
Frpb, ped/bikes		1.00	0.99		1.00	1.00		1.00	1.00	0.93		0.98
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00
Frt		1.00	0.96		1.00	1.00		1.00	1.00	0.85		0.91
Flt Protected		0.95	1.00		0.95	1.00		0.95	0.97	1.00		0.99
Satd. Flow (prot)		1752	4802		1480	4233		3042	1559	1391		2748
Flt Permitted		0.95	1.00		0.95	1.00		0.95	0.97	1.00		0.99
Satd. Flow (perm)		1752	4802		1480	4233		3042	1559	1391		2748
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	1	324	2036	784	48	896	21	501	93	128	10	16
RTOR Reduction (vph)	0	0	0	0	0	1	0	0	0	101	0	60
Lane Group Flow (vph)	0	325	2820	0	48	916	0	391	203	27	0	2
Confl. Peds. (#/hr)							9			51		
Confl. Bikes (#/hr)				9			1			4		
Heavy Vehicles (%)	2%	3%	3%	3%	22%	22%	22%	8%	8%	8%	17%	17%
Turn Type	Prot	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA
Protected Phases	1	1	6		5	2		4	4		7	7
Permitted Phases										4		
Actuated Green, G (s)		14.3	40.9		7.3	33.9		26.4	26.4	26.4		3.4
Effective Green, g (s)		14.3	40.9		7.3	33.9		26.4	26.4	26.4		3.4
Actuated g/C Ratio		0.11	0.32		0.06	0.27		0.21	0.21	0.21		0.03
Clearance Time (s)		4.0	4.6		4.0	4.6		4.0	4.0	4.0		4.0
Vehicle Extension (s)		2.0	3.0		2.0	3.0		2.0	2.0	2.0		2.0
Lane Grp Cap (vph)		197	1551		85	1133		634	325	290		73
v/s Ratio Prot		c0.19	c0.59		0.03	0.22		0.13	c0.13			c0.00
v/s Ratio Perm										0.02		
v/c Ratio		1.65	1.82		0.56	0.81		0.62	0.62	0.09		0.02
Uniform Delay, d1		56.1	42.8		58.1	43.3		45.5	45.6	40.4		60.0
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00
Incremental Delay, d2		314.0	370.7		5.0	4.3		1.3	2.7	0.1		0.0
Delay (s)		370.1	413.6		63.1	47.6		46.8	48.3	40.5		60.0
Level of Service		F	F		E	D		D	D	D		E
Approach Delay (s)			409.1			48.4			46.1			60.0
Approach LOS			F			D			D			E

Intersection Summary			
HCM 2000 Control Delay	377.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.59		
Actuated Cycle Length (s)	126.6	Sum of lost time (s)	21.1
Intersection Capacity Utilization	161.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR2	NER	NER2
Lane Configurations			
Traffic Volume (vph)	36	1813	654
Future Volume (vph)	36	1813	654
Ideal Flow (vphpl)	1900	1990	1900
Total Lost time (s)		4.5	4.5
Lane Util. Factor		*0.95	1.00
Frpb, ped/bikes		1.00	1.00
Flpb, ped/bikes		1.00	1.00
Frt		1.00	0.85
Flt Protected		1.00	1.00
Satd. Flow (prot)		3781	1615
Flt Permitted		1.00	1.00
Satd. Flow (perm)		3781	1615
Peak-hour factor, PHF	0.99	0.99	0.99
Adj. Flow (vph)	36	1831	661
RTOR Reduction (vph)	0	0	0
Lane Group Flow (vph)	0	1831	661
Confl. Peds. (#/hr)			63
Confl. Bikes (#/hr)	2		
Heavy Vehicles (%)	17%	0%	0%
Turn Type		Prot	Prot
Protected Phases		3	3
Permitted Phases			
Actuated Green, G (s)		27.5	27.5
Effective Green, g (s)		27.5	27.5
Actuated g/C Ratio		0.22	0.22
Clearance Time (s)		4.5	4.5
Vehicle Extension (s)		2.0	2.0
Lane Grp Cap (vph)		821	350
v/s Ratio Prot		c0.48	0.41
v/s Ratio Perm			
v/c Ratio		2.23	1.89
Uniform Delay, d1		49.5	49.5
Progression Factor		1.00	1.00
Incremental Delay, d2		557.5	410.5
Delay (s)		607.1	460.1
Level of Service		F	F
Approach Delay (s)			
Approach LOS			

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	187	660	3	1	175	36	2	2	1	59	2	120
Future Volume (vph)	187	660	3	1	175	36	2	2	1	59	2	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			0.95	0.95
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.97			0.97			0.95	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.97	1.00
Satd. Flow (prot)	1752	3502		1378	2672			1812			1394	1289
Flt Permitted	0.95	1.00		0.95	1.00			1.00			0.81	1.00
Satd. Flow (perm)	1752	3502		1378	2672			1849			1158	1289
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	189	667	3	1	177	36	2	2	1	60	2	121
RTOR Reduction (vph)	0	0	0	0	0	0	0	1	0	0	16	76
Lane Group Flow (vph)	189	670	0	1	213	0	0	4	0	0	79	12
Confl. Peds. (#/hr)						11						
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	3%	3%	3%	31%	31%	31%	0%	0%	0%	19%	19%	19%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			3			4	
Permitted Phases							3			4		4
Actuated Green, G (s)	10.7	28.0		0.5	17.8			0.6			6.9	6.9
Effective Green, g (s)	10.7	28.0		0.5	17.8			0.6			6.9	6.9
Actuated g/C Ratio	0.21	0.54		0.01	0.34			0.01			0.13	0.13
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Vehicle Extension (s)	2.0	2.5		2.0	2.5			2.0			2.0	2.0
Lane Grp Cap (vph)	360	1885		13	914			21			153	171
v/s Ratio Prot	c0.11	c0.19		0.00	0.08							
v/s Ratio Perm								c0.00			c0.07	0.01
v/c Ratio	0.53	0.36		0.08	0.23			0.19			0.52	0.07
Uniform Delay, d1	18.4	6.8		25.5	12.2			25.5			21.0	19.7
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.6	0.1		0.9	0.1			1.6			1.2	0.1
Delay (s)	19.0	6.9		26.4	12.3			27.1			22.2	19.8
Level of Service	B	A		C	B			C			C	B
Approach Delay (s)		9.6			12.4			27.1			21.1	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	11.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	52.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	42.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Intersection Delay, s/veh	258.5
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	253	37	104	925	13	318	0	112	4	12	39
Future Vol, veh/h	8	253	37	104	925	13	318	0	112	4	12	39
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	22	22	22	10	10	10	7	7	7	100	100	100
Mvmt Flow	8	266	39	109	974	14	335	0	118	4	13	41
Number of Lanes	0	1	1	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	23.5	432.4	30.8	17.6
HCM LOS	C	F	D	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	100%	0%	3%	0%	100%	0%	7%
Vol Thru, %	0%	0%	97%	0%	0%	99%	22%
Vol Right, %	0%	100%	0%	100%	0%	1%	71%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	318	112	261	37	104	938	55
LT Vol	318	0	8	0	104	0	4
Through Vol	0	0	253	0	0	925	12
RT Vol	0	112	0	37	0	13	39
Lane Flow Rate	335	118	275	39	109	987	58
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.756	0.227	0.607	0.078	0.239	2.01	0.162
Departure Headway (Hd)	9.669	8.421	9.206	8.457	7.852	7.329	12.249
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	378	429	396	426	457	504	295
Service Time	7.369	6.121	6.906	6.157	5.616	5.093	10.249
HCM Lane V/C Ratio	0.886	0.275	0.694	0.092	0.239	1.958	0.197
HCM Control Delay	36.9	13.6	25.1	11.9	13.1	478.9	17.6
HCM Lane LOS	E	B	D	B	B	F	C
HCM 95th-tile Q	6.1	0.9	3.9	0.3	0.9	67	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	265	4	61	8	4	27	27	1162	5	20	420	29
Future Volume (veh/h)	265	4	61	8	4	27	27	1162	5	20	420	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	22	0	0	0	0
Ped-Bike Adj(A_pbT)	0.97		0.97	0.97		0.96	1.00		0.97	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1648	1648	1648	1796	1796	1796	1811	1811	1811
Adj Flow Rate, veh/h	268	4	14	8	4	6	27	1174	5	20	424	25
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	1	1	17	17	17	7	7	7	6	6	6
Cap, veh/h	438	91	319	389	147	220	79	1840	7	63	1708	100
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.05	0.53	0.53	0.04	0.52	0.52
Sat Flow, veh/h	1380	360	1259	1198	580	870	1711	3485	15	1725	3295	194
Grp Volume(v), veh/h	268	0	18	8	0	10	27	575	604	20	221	228
Grp Sat Flow(s),veh/h/ln	1380	0	1619	1198	0	1450	1711	1706	1793	1725	1721	1768
Q Serve(g_s), s	13.6	0.0	0.6	0.4	0.0	0.4	1.1	18.0	18.0	0.8	5.3	5.4
Cycle Q Clear(g_c), s	14.0	0.0	0.6	1.0	0.0	0.4	1.1	18.0	18.0	0.8	5.3	5.4
Prop In Lane	1.00		0.78	1.00		0.60	1.00		0.01	1.00		0.11
Lane Grp Cap(c), veh/h	438	0	410	389	0	367	79	901	947	63	892	916
V/C Ratio(X)	0.61	0.00	0.04	0.02	0.00	0.03	0.34	0.64	0.64	0.32	0.25	0.25
Avail Cap(c_a), veh/h	657	0	667	580	0	597	237	901	947	239	892	916
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98
Uniform Delay (d), s/veh	26.3	0.0	21.2	21.5	0.0	21.1	34.7	13.3	13.3	35.2	10.0	10.0
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.0	0.0	0.0	1.0	3.5	3.3	1.1	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	2.7	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	0.0	0.2	0.1	0.0	0.1	0.5	8.6	8.9	0.4	2.0	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.8	0.0	21.2	21.5	0.0	21.1	35.6	19.7	19.2	36.3	10.6	10.6
LnGrp LOS	C	A	C	C	A	C	D	B	B	D	B	B
Approach Vol, veh/h		286			18			1206			469	
Approach Delay, s/veh		26.5			21.3			19.8			11.7	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.7	44.7		23.6	7.4	44.0		23.6				
Change Period (Y+Rc), s	4.0	5.1		4.6	4.0	5.1		4.6				
Max Green Setting (Gmax), s	10.4	20.0		30.9	10.4	20.0		30.9				
Max Q Clear Time (g_c+I1), s	2.8	20.0		16.0	3.1	7.4		3.0				
Green Ext Time (p_c), s	0.0	0.0		0.4	0.0	1.4		0.0				

Intersection Summary			
HCM 6th Ctrl Delay			18.9
HCM 6th LOS			B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	839	141	12	3341	422	322
Future Volume (veh/h)	839	141	12	3341	422	322
Initial Q (Qb), veh	0	0	0	0	5	0
Ped-Bike Adj(A_pbT)		0.96	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1781	1781	1856	1856	1781	1781
Adj Flow Rate, veh/h	847	125	12	3375	426	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	8	8	3	3	8	8
Cap, veh/h	2186	320	30	2583	489	
Arrive On Green	1.00	1.00	0.02	0.64	0.28	0.00
Sat Flow, veh/h	4416	624	1767	5233	1697	2657
Grp Volume(v), veh/h	644	328	12	3375	426	0
Grp Sat Flow(s),veh/h/ln	1621	1637	1767	1689	1697	1329
Q Serve(g_s), s	0.0	0.0	0.7	64.2	24.2	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.7	64.2	24.2	0.0
Prop In Lane		0.38	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1666	840	30	2583	489	
V/C Ratio(X)	0.39	0.39	0.40	1.31	0.87	
Avail Cap(c_a), veh/h	1896	957	141	3251	696	
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.98	0.98	0.09	0.09	1.00	0.00
Uniform Delay (d), s/veh	1.5	1.5	48.6	24.5	34.4	0.0
Incr Delay (d2), s/veh	0.7	1.3	0.3	138.1	8.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	5.9	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.7	0.3	51.9	12.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	2.1	2.8	48.9	162.6	48.8	0.0
LnGrp LOS	A	A	D	F	D	
Approach Vol, veh/h	972			3387	426	A
Approach Delay, s/veh	2.4			162.2	48.8	
Approach LOS	A			F	D	

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.7	62.5				68.2		31.8
Change Period (Y+Rc), s	4.0	4.0				4.0		4.0
Max Green Setting (Gmax), s	8.0	39.0				51.0		41.0
Max Q Clear Time (g_c+I1), s	2.7	2.0				66.2		26.2
Green Ext Time (p_c), s	0.0	4.7				0.0		1.6

Intersection Summary	
HCM 6th Ctrl Delay	119.7
HCM 6th LOS	F

Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	162	808	191	762	1992	490	577	157	416	124	351	771
Future Volume (veh/h)	162	808	191	762	1992	490	577	157	416	124	351	771
Initial Q (Qb), veh	0	0	0	0	34	0	0	0	0	0	32	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.94	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1722	1722	1722	1870	1870	1870	1767	1767	1767	1856	1856	1856
Adj Flow Rate, veh/h	164	816	41	770	2012	467	583	159	0	125	355	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	12	12	12	2	2	2	9	9	9	3	3	3
Cap, veh/h	704	2959	910	461	1563	130	325	650		164	563	
Arrive On Green	0.22	0.42	0.42	0.18	0.44	0.44	0.19	0.23	0.00	0.09	0.13	0.00
Sat Flow, veh/h	1640	4701	1440	3456	4130	911	1682	1767	1497	1767	3526	1572
Grp Volume(v), veh/h	164	816	41	770	1639	840	583	159	0	125	355	0
Grp Sat Flow(s),veh/h/ln	1640	1567	1440	1728	1702	1637	1682	1767	1497	1767	1763	1572
Q Serve(g_s), s	13.0	18.2	1.4	20.0	49.1	49.1	29.0	11.4	0.0	10.4	14.6	0.0
Cycle Q Clear(g_c), s	13.0	18.2	1.4	20.0	49.1	49.1	29.0	11.4	0.0	10.4	14.6	0.0
Prop In Lane	1.00		1.00	1.00		0.56	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	704	2959	910	461	1114	579	325	650		164	563	
V/C Ratio(X)	0.23	0.28	0.05	1.67	1.47	1.45	1.79	0.24		0.76	0.63	
Avail Cap(c_a), veh/h	364	1983	607	461	1114	536	325	625		224	1020	
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.95	0.95	0.95	0.09	0.09	0.09	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	27.8	13.2	16.2	61.7	42.3	42.3	60.5	33.2	0.0	66.4	61.4	0.0
Incr Delay (d2), s/veh	0.1	0.2	0.1	302.9	212.6	203.5	368.6	0.1	0.0	6.2	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	73.2	70.5	0.0	0.0	0.0	0.0	62.8	0.0
%ile BackOfQ(50%),veh/ln	3.8	4.2	0.5	27.9	63.6	64.2	45.6	4.1	0.0	5.0	13.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.9	13.4	16.3	364.6	328.1	316.3	429.1	33.3	0.0	72.7	124.6	0.0
LnGrp LOS	C	B	B	F	F	F	F	C		E	F	
Approach Vol, veh/h		1021			3249			742	A		480	A
Approach Delay, s/veh		15.9			333.7			344.3			111.1	
Approach LOS		B			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	24.0	68.2	33.9	23.9	38.2	54.0	17.9	39.9
Change Period (Y+Rc), s	4.0	4.9	4.9	* 4.6	4.9	* 4.9	4.0	4.9
Max Green Setting (Gmax), s	20.0	40.1	29.0	* 43	11.0	* 49	19.0	53.1
Max Q Clear Time (g_c+I1), s	22.0	20.2	31.0	16.6	15.0	51.1	12.4	13.4
Green Ext Time (p_c), s	0.0	3.9	0.0	1.4	0.0	0.0	0.1	0.5

Intersection Summary	
HCM 6th Ctrl Delay	256.6
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	360	807	181	308	2390	14	308	60	35	43	448	556
Future Volume (veh/h)	360	807	181	308	2390	14	308	60	35	43	448	556
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.92	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1663	1663	1663	1856	1856	1856	1767	1767	1767	1826	1826	1826
Adj Flow Rate, veh/h	364	815	183	311	2414	13	311	61	5	43	453	300
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	16	16	16	3	3	3	9	9	9	5	5	5
Cap, veh/h	410	1430	434	362	1493	8	326	651	285	464	487	707
Arrive On Green	0.27	0.63	0.63	0.11	0.29	0.29	0.19	0.19	0.19	0.27	0.27	0.27
Sat Flow, veh/h	3072	4540	1378	3428	5197	28	1682	3357	1467	1739	1826	2652
Grp Volume(v), veh/h	364	815	183	311	1568	859	311	61	5	43	453	300
Grp Sat Flow(s),veh/h/ln	1536	1513	1378	1714	1689	1848	1682	1678	1467	1739	1826	1326
Q Serve(g_s), s	17.1	15.5	10.0	13.4	43.1	43.1	27.4	2.2	0.4	2.8	36.3	14.0
Cycle Q Clear(g_c), s	17.1	15.5	10.0	13.4	43.1	43.1	27.4	2.2	0.4	2.8	36.3	14.0
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	410	1430	434	362	970	531	326	651	285	464	487	707
V/C Ratio(X)	0.89	0.57	0.42	0.86	1.62	1.62	0.95	0.09	0.02	0.09	0.93	0.42
Avail Cap(c_a), veh/h	410	1430	434	487	970	531	326	651	285	498	523	760
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.83	0.83	0.83	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.9	21.9	20.9	66.0	53.4	53.5	59.8	49.6	48.9	41.4	53.6	45.5
Incr Delay (d2), s/veh	17.8	1.4	2.5	8.9	281.8	287.0	37.0	0.0	0.0	0.0	21.9	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	4.3	3.0	6.3	56.2	62.3	15.0	0.9	0.2	1.2	19.6	4.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.7	23.3	23.3	74.9	335.3	340.4	96.8	49.6	48.9	41.4	75.5	45.6
LnGrp LOS	E	C	C	E	F	F	F	D	D	D	E	D
Approach Vol, veh/h		1362			2738			377			796	
Approach Delay, s/veh		36.2			307.3			88.5			62.4	
Approach LOS		D			F			F			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	24.0	48.0		44.0	20.7	51.3		34.0				
Change Period (Y+Rc), s	4.0	4.9		4.0	4.9	4.0		4.9				
Max Green Setting (Gmax), s	17.0	43.1		43.0	21.3	38.8		29.1				
Max Q Clear Time (g_c+I1), s	19.1	45.1		38.3	15.4	17.5		29.4				
Green Ext Time (p_c), s	0.0	0.0		1.4	0.5	6.2		0.0				

Intersection Summary			
HCM 6th Ctrl Delay			184.7
HCM 6th LOS			F

HCM 6th Signalized Intersection Summary
9: So. Airport Blvd. & Mitchell Ave. & Gateway Blvd. 02/26/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	148	485	130	1119	14	468	712	175	10	260	1207
Future Volume (veh/h)	110	148	485	130	1119	14	468	712	175	10	260	1207
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		1.00	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1781	1781	1811	1811	1811	1767	1767	1767	1841	1841	1841
Adj Flow Rate, veh/h	111	149	106	131	1130	3	473	719	0	10	263	926
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	8	8	8	6	6	6	9	9	9	4	4	4
Cap, veh/h	301	421	611	161	1177	355	752	773		469	493	705
Arrive On Green	0.09	0.24	0.24	0.09	0.24	0.24	0.23	0.23	0.00	0.27	0.27	0.27
Sat Flow, veh/h	3291	1781	2584	1725	4944	1492	3264	3445	0	1753	1841	2633
Grp Volume(v), veh/h	111	149	106	131	1130	3	473	719	0	10	263	926
Grp Sat Flow(s),veh/h/ln	1646	1781	1292	1725	1648	1492	1632	1678	0	1753	1841	1316
Q Serve(g_s), s	3.3	7.3	3.4	7.8	23.7	0.2	13.7	22.0	0.0	0.4	12.8	28.1
Cycle Q Clear(g_c), s	3.3	7.3	3.4	7.8	23.7	0.2	13.7	22.0	0.0	0.4	12.8	28.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	301	421	611	161	1177	355	752	773		469	493	705
V/C Ratio(X)	0.37	0.35	0.17	0.82	0.96	0.01	0.63	0.93		0.02	0.53	1.31
Avail Cap(c_a), veh/h	313	424	615	164	1177	355	752	773		469	493	705
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.73	0.73	0.73	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.8	33.4	31.9	46.7	39.5	30.5	36.4	39.6	0.0	28.3	32.9	38.5
Incr Delay (d2), s/veh	0.2	0.3	0.1	24.1	17.3	0.0	4.0	19.2	0.0	0.0	0.6	151.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	3.2	1.1	4.4	11.3	0.1	5.8	10.9	0.0	0.2	5.7	23.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.0	33.7	32.0	70.8	56.8	30.5	40.3	58.7	0.0	28.3	33.4	189.8
LnGrp LOS	D	C	C	E	E	C	D	E		C	C	F
Approach Vol, veh/h		366			1264			1192	A		1199	
Approach Delay, s/veh		36.6			58.2			51.4			154.2	
Approach LOS		D			E			D			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.8	29.4		28.8	13.6	29.6		33.0
Change Period (Y+Rc), s	4.0	4.6		4.6	4.0	4.6		4.9
Max Green Setting (Gmax), s	10.0	25.0		23.8	10.0	25.0		28.1
Max Q Clear Time (g_c+I1), s	9.8	9.3		24.0	5.3	25.7		30.1
Green Ext Time (p_c), s	0.0	0.9		0.0	0.1	0.0		0.0

Intersection Summary		
HCM 6th Ctrl Delay		82.8
HCM 6th LOS		F

Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	169	262	208	1977	311	416	112	29	362	158	1139	183
Future Volume (veh/h)	169	262	208	1977	311	416	112	29	362	158	1139	183
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1811	1811	1678	1678	1678	1856	1856	1856
Adj Flow Rate, veh/h	145	301	0	1997	314	0	113	29	0	160	1151	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	6	6	6	6	6	6	15	15	15	3	3	3
Cap, veh/h	199	417		1475	549		143	757		328	1203	
Arrive On Green	0.12	0.12	0.00	0.30	0.30	0.00	0.09	0.24	0.00	0.19	0.34	0.00
Sat Flow, veh/h	1725	3622	1535	4864	1811	1535	1598	3188	1422	1767	3526	1572
Grp Volume(v), veh/h	145	301	0	1997	314	0	113	29	0	160	1151	0
Grp Sat Flow(s),veh/h/ln	1725	1811	1535	1621	1811	1535	1598	1594	1422	1767	1763	1572
Q Serve(g_s), s	9.7	9.6	0.0	36.4	17.5	0.0	8.3	0.8	0.0	9.7	38.3	0.0
Cycle Q Clear(g_c), s	9.7	9.6	0.0	36.4	17.5	0.0	8.3	0.8	0.0	9.7	38.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	199	417		1475	549		143	757		328	1203	
V/C Ratio(X)	0.73	0.72		1.35	0.57		0.79	0.04		0.49	0.96	
Avail Cap(c_a), veh/h	316	664		1475	549		146	757		328	1203	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.09	0.09	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	51.3	51.2	0.0	41.8	35.2	0.0	53.5	35.2	0.0	43.7	38.7	0.0
Incr Delay (d2), s/veh	1.9	0.9	0.0	159.5	0.1	0.0	22.2	0.1	0.0	0.4	17.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	4.4	0.0	36.3	7.8	0.0	4.2	0.3	0.0	4.3	19.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.2	52.1	0.0	201.3	35.4	0.0	75.7	35.3	0.0	44.2	56.2	0.0
LnGrp LOS	D	D		F	D		E	D		D	E	
Approach Vol, veh/h		446	A		2311	A		142	A		1311	A
Approach Delay, s/veh		52.5			178.8			67.5			54.7	
Approach LOS		D			F			E			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.7	45.8		18.4	27.2	33.4		41.0				
Change Period (Y+Rc), s	4.0	4.9		4.6	4.9	* 4.9		4.6				
Max Green Setting (Gmax), s	11.0	32.5		22.0	15.0	* 29		36.4				
Max Q Clear Time (g_c+I1), s	10.3	40.3		11.7	11.7	2.8		38.4				
Green Ext Time (p_c), s	0.0	0.0		1.2	0.1	0.1		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	123.0
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	203	0	20	4	0	45	3	1455	3	104	501	9
Future Volume (veh/h)	203	0	20	4	0	45	3	1455	3	104	501	9
Initial Q (Qb), veh	0	0	0	0	0	0	0	44	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1841	1841	1841	1796	1796	1796
Adj Flow Rate, veh/h	205	0	2	4	0	2	3	1470	3	105	506	8
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0	4	4	4	7	7	7
Cap, veh/h	356	0	317	124	15	31	6	2016	3	134	2193	35
Arrive On Green	0.20	0.00	0.20	0.20	0.00	0.20	0.00	0.56	0.56	0.08	0.64	0.64
Sat Flow, veh/h	1324	0	1591	239	76	158	1753	3581	7	1711	3438	54
Grp Volume(v), veh/h	205	0	2	6	0	0	3	718	755	105	251	263
Grp Sat Flow(s),veh/h/ln	1324	0	1591	473	0	0	1753	1749	1839	1711	1706	1786
Q Serve(g_s), s	0.0	0.0	0.1	0.0	0.0	0.0	0.1	23.9	23.9	4.7	4.9	4.9
Cycle Q Clear(g_c), s	11.8	0.0	0.1	11.9	0.0	0.0	0.1	23.9	23.9	4.7	4.9	4.9
Prop In Lane	1.00		1.00	0.67		0.33	1.00		0.00	1.00		0.03
Lane Grp Cap(c), veh/h	356	0	317	171	0	0	6	984	1035	134	1088	1139
V/C Ratio(X)	0.58	0.00	0.01	0.04	0.00	0.00	0.53	0.73	0.73	0.78	0.23	0.23
Avail Cap(c_a), veh/h	508	0	487	329	0	0	537	984	1035	524	1088	1139
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.9	0.0	25.2	26.0	0.0	0.0	39.0	14.2	14.1	35.5	6.0	6.0
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.0	0.0	0.0	25.7	4.7	4.5	3.8	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.3	12.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	0.0	0.1	0.0	0.0	0.1	15.3	15.5	2.1	1.6	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.4	0.0	25.2	26.0	0.0	0.0	64.7	32.2	30.6	39.2	6.5	6.5
LnGrp LOS	C	A	C	C	A	A	E	C	C	D	A	A
Approach Vol, veh/h		207			6			1476			619	
Approach Delay, s/veh		30.4			26.0			31.5			12.1	
Approach LOS		C			C			C			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.1	48.6		19.6	4.3	54.5		19.6				
Change Period (Y+Rc), s	4.0	4.5		4.0	4.0	4.5		4.0				
Max Green Setting (Gmax), s	24.0	30.0		24.0	24.0	50.0		24.0				
Max Q Clear Time (g_c+I1), s	6.7	25.9		13.8	2.1	6.9		13.9				
Green Ext Time (p_c), s	0.1	2.6		0.5	0.0	2.1		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			26.2									
HCM 6th LOS			C									

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	253	839	295	1788	1145	2326	541	166	215	0	0	0
Future Volume (veh/h)	253	839	295	1788	1145	2326	541	166	215	0	0	0
Initial Q (Qb), veh	0	0	0	32	16	0	10	0	5			
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1841	1841	1841	1870	1870	1870	1826	1826	1826			
Adj Flow Rate, veh/h	256	847	115	1806	1466	1775	546	168	217			
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99			
Percent Heavy Veh, %	4	4	4	2	2	2	5	5	5			
Cap, veh/h	247	976	398	1388	2259	1881	682	390	1651			
Arrive On Green	0.07	0.27	0.27	0.41	0.61	0.61	0.20	0.20	0.20			
Sat Flow, veh/h	3506	3681	1503	3563	3741	3170	3374	1826	2723			
Grp Volume(v), veh/h	256	847	115	1806	1466	1775	546	168	217			
Grp Sat Flow(s),veh/h/ln	1753	1841	1503	1781	1870	1585	1687	1826	1362			
Q Serve(g_s), s	7.4	22.1	6.1	41.5	25.7	50.7	15.7	8.3	3.5			
Cycle Q Clear(g_c), s	7.4	22.1	6.1	41.5	25.7	50.7	15.7	8.3	3.5			
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	247	976	398	1388	2259	1881	682	390	1651			
V/C Ratio(X)	1.04	0.87	0.29	1.30	0.65	0.94	0.80	0.43	0.13			
Avail Cap(c_a), veh/h	260	1000	408	1460	2272	1925	833	451	1788			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	49.5	36.4	30.3	32.5	13.8	19.5	39.3	35.3	8.7			
Incr Delay (d2), s/veh	66.5	8.4	0.6	140.8	0.7	10.2	3.7	0.3	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	83.0	1.0	0.0	7.7	0.0	0.1			
%ile BackOfQ(50%),veh/ln	5.6	11.3	2.4	60.6	12.1	20.9	8.2	3.7	4.7			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	116.0	44.8	30.9	256.3	15.6	29.7	50.8	35.6	8.8			
LnGrp LOS	F	D	C	F	B	C	D	D	A			
Approach Vol, veh/h		1218			5047			931				
Approach Delay, s/veh		58.4			106.7			38.2				
Approach LOS		E			F			D				

Timer - Assigned Phs	1	2		4	5	6			
Phs Duration (G+Y+Rc), s	45.0	32.4		23.8	11.0	66.4			
Change Period (Y+Rc), s	3.5	5.0		4.0	3.5	5.0			
Max Green Setting (Gmax), s	41.5	27.5		25.0	7.5	61.5			
Max Q Clear Time (g_c+I1), s	43.5	24.1		17.7	9.4	52.7			
Green Ext Time (p_c), s	0.0	2.5		2.1	0.0	8.7			

Intersection Summary	
HCM 6th Ctrl Delay	89.7
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary
22: Veterans Blvd & Oyster Point Blvd.

02/26/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	237	1022	30	7	2922	41	150	1	18	27	10	275
Future Volume (veh/h)	237	1022	30	7	2922	41	150	1	18	27	10	275
Initial Q (Qb), veh	0	32	0	0	140	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.99	1.00		0.96	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1678	1678	1678	1870	1870	1870	1841	1841	1841	1870	1870	1870
Adj Flow Rate, veh/h	239	1032	29	7	2952	40	152	1	1	27	10	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	15	15	15	2	2	2	4	4	4	2	2	2
Cap, veh/h	199	2257	59	15	3431	25	225	106	106	43	16	91
Arrive On Green	0.06	0.71	0.71	0.01	0.66	0.66	0.13	0.13	0.13	0.03	0.03	0.00
Sat Flow, veh/h	3100	3162	89	1781	5191	70	1753	824	824	1317	488	2790
Grp Volume(v), veh/h	239	520	541	7	1931	1061	152	0	2	37	0	0
Grp Sat Flow(s),veh/h/ln	1550	1594	1657	1781	1702	1857	1753	0	1647	1805	0	1395
Q Serve(g_s), s	9.0	19.5	19.5	0.5	63.1	64.2	11.6	0.0	0.1	2.8	0.0	0.0
Cycle Q Clear(g_c), s	9.0	19.5	19.5	0.5	63.1	64.2	11.6	0.0	0.1	2.8	0.0	0.0
Prop In Lane	1.00		0.05	1.00		0.04	1.00		0.50	0.73		1.00
Lane Grp Cap(c), veh/h	199	1135	1181	15	2234	1222	225	0	211	59	0	91
V/C Ratio(X)	1.20	0.46	0.46	0.46	0.86	0.87	0.68	0.00	0.01	0.63	0.00	0.00
Avail Cap(c_a), veh/h	199	1135	1180	64	2234	1218	338	0	318	77	0	120
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.45	0.45	0.45	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	65.5	9.8	9.8	69.1	24.1	24.1	58.2	0.0	53.3	66.9	0.0	0.0
Incr Delay (d2), s/veh	109.7	0.6	0.6	7.9	4.8	8.5	1.3	0.0	0.0	4.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	2.6	2.4	0.0	89.4	78.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.6	10.0	10.2	0.3	62.6	65.9	5.3	0.0	0.1	1.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	175.2	13.1	12.8	77.0	118.3	110.6	59.6	0.0	53.3	70.9	0.0	0.0
LnGrp LOS	F	B	B	E	F	F	E	A	D	E	A	A
Approach Vol, veh/h		1300			2999			154			37	
Approach Delay, s/veh		42.8			115.4			59.5			70.9	
Approach LOS		D			F			E			E	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.0	96.5		22.0	5.2	104.3		8.6
Change Period (Y+Rc), s	4.0	4.6		4.0	4.0	4.6		4.0
Max Green Setting (Gmax), s	9.0	81.4		27.0	5.0	85.4		6.0
Max Q Clear Time (g_c+I1), s	11.0	66.2		13.6	2.5	21.5		4.8
Green Ext Time (p_c), s	0.0	14.2		0.3	0.0	8.4		0.0

Intersection Summary	
HCM 6th Ctrl Delay	92.1
HCM 6th LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	402	40	273	1063	350	68	285	369	616	636	521
Future Volume (veh/h)	118	402	40	273	1063	350	68	285	369	616	636	521
Initial Q (Qb), veh	0	0	0	0	10	0	0	0	32	0	36	18
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1885	1885	1885	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	119	406	29	276	1074	325	69	288	373	622	642	350
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	1	1	1	2	2	2	2	2	2
Cap, veh/h	149	1724	122	387	1268	112	114	435	862	582	1142	504
Arrive On Green	0.08	0.35	0.35	0.11	0.38	0.38	0.06	0.18	0.18	0.18	0.31	0.31
Sat Flow, veh/h	1781	4861	343	3483	2702	808	1781	1870	2790	3456	3554	1529
Grp Volume(v), veh/h	119	283	152	276	708	691	69	288	373	622	642	350
Grp Sat Flow(s),veh/h/ln	1781	1702	1800	1742	1791	1719	1781	1870	1395	1728	1777	1529
Q Serve(g_s), s	7.2	6.4	6.6	8.4	42.0	42.0	4.1	16.4	0.0	19.7	16.8	17.2
Cycle Q Clear(g_c), s	7.2	6.4	6.6	8.4	42.0	42.0	4.1	16.4	0.0	19.7	16.8	17.2
Prop In Lane	1.00		0.19	1.00		0.47	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	149	1207	638	387	684	697	114	435	862	582	1142	504
V/C Ratio(X)	0.80	0.23	0.24	0.71	1.04	0.99	0.61	0.66	0.43	1.07	0.56	0.69
Avail Cap(c_a), veh/h	162	1207	638	412	684	656	130	493	1046	619	1090	469
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.23	0.23	0.23	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.5	25.0	25.0	47.2	34.0	34.0	50.1	38.4	32.2	45.7	32.7	21.3
Incr Delay (d2), s/veh	19.8	0.5	0.9	1.0	26.5	14.6	3.4	7.7	1.6	57.3	2.0	7.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	26.3	22.3	0.0	0.0	17.5	0.0	16.4	30.1
%ile BackOfQ(50%),veh/ln	4.1	2.7	3.0	3.6	27.2	24.6	1.9	7.8	7.3	12.4	12.1	13.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.3	25.4	25.9	48.2	86.8	70.9	53.5	46.1	51.3	103.1	51.0	59.2
LnGrp LOS	E	C	C	D	F	E	D	D	D	F	D	E
Approach Vol, veh/h		554			1675			730			1614	
Approach Delay, s/veh		35.0			73.9			49.4			72.8	
Approach LOS		C			E			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	38.7	13.2	47.0	24.7	25.1	16.2	44.0
Change Period (Y+Rc), s	4.0	5.0	4.0	5.0	5.0	* 5	4.0	5.0
Max Green Setting (Gmax), s	8.0	32.0	10.0	42.0	11.0	* 29	13.0	39.0
Max Q Clear Time (g_c+I1), s	6.1	19.2	9.2	44.0	21.7	18.4	10.4	8.6
Green Ext Time (p_c), s	0.0	3.2	0.0	0.0	0.0	1.7	0.2	1.9

Intersection Summary	
HCM 6th Ctrl Delay	64.9
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	668	2	75	2	0	3	63	251	3	0	130	1953
Future Volume (veh/h)	668	2	75	2	0	3	63	251	3	0	130	1953
Initial Q (Qb), veh	0	0	0	0	0	0	12	12	0	0	0	24
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1900	1900	1900	1841	1841	1841	0	1856	1856
Adj Flow Rate, veh/h	675	2	27	2	0	0	64	254	2	0	131	1587
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	4	4	4	0	0	0	4	4	4	0	3	3
Cap, veh/h	802	26	346	4	0	0	111	1175	8	0	1023	2138
Arrive On Green	0.25	0.25	0.25	0.00	0.00	0.00	0.05	0.61	0.61	0.00	0.52	0.52
Sat Flow, veh/h	3401	109	1468	1809	0	0	1753	1823	14	0	1856	2768
Grp Volume(v), veh/h	675	0	29	2	0	0	64	0	256	0	131	1587
Grp Sat Flow(s),veh/h/ln	1700	0	1577	1810	0	0	1753	0	1837	0	1856	1384
Q Serve(g_s), s	12.5	0.0	0.9	0.1	0.0	0.0	2.4	0.0	4.2	0.0	2.4	21.2
Cycle Q Clear(g_c), s	12.5	0.0	0.9	0.1	0.0	0.0	2.4	0.0	4.2	0.0	2.4	21.2
Prop In Lane	1.00		0.93	1.00		0.00	1.00		0.01	0.00		1.00
Lane Grp Cap(c), veh/h	802	0	372	4	0	0	111	0	1129	0	1023	2138
V/C Ratio(X)	0.84	0.00	0.08	0.51	0.00	0.00	0.57	0.00	0.23	0.00	0.13	0.74
Avail Cap(c_a), veh/h	1423	0	660	108	0	0	183	0	2087	0	1830	3409
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	30.9	0.0	25.2	41.9	0.0	0.0	51.5	0.0	6.4	0.0	8.8	4.8
Incr Delay (d2), s/veh	0.9	0.0	0.0	76.3	0.0	0.0	4.6	0.0	0.1	0.0	0.1	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	195.9	0.0	1.1	0.0	0.0	3.5
%ile BackOfQ(50%),veh/ln	6.4	0.0	0.4	0.1	0.0	0.0	9.3	0.0	2.9	0.0	1.1	15.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.8	0.0	25.2	118.2	0.0	0.0	252.0	0.0	7.6	0.0	8.8	8.8
LnGrp LOS	C	A	C	F	A	A	F	A	A	A	A	A
Approach Vol, veh/h		704			2			320			1718	
Approach Delay, s/veh		31.5			118.2			56.4			8.8	
Approach LOS		C			F			E			A	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	6.1	38.3		3.1		44.3		19.4				
Change Period (Y+Rc), s	3.0	3.5		3.0		3.5		3.0				
Max Green Setting (Gmax), s	7.0	66.0		4.0		76.0		28.0				
Max Q Clear Time (g_c+I1), s	4.4	23.2		2.1		6.2		14.5				
Green Ext Time (p_c), s	0.0	11.6		0.0		0.8		1.9				

Intersection Summary			
HCM 6th Ctrl Delay			20.3
HCM 6th LOS			C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	191	85	1403	488	744	64	482	166	656	447	138
Future Volume (vph)	160	191	85	1403	488	744	64	482	166	656	447	138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
Lane Util. Factor	1.00	1.00		0.97	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.96		1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1608	1558		3060	1660	1388	1547	3094	1384	3001	3094	1333
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1608	1558		3060	1660	1388	1547	3094	1384	3001	3094	1333
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	162	193	86	1417	493	752	65	487	168	663	452	139
RTOR Reduction (vph)	0	14	0	0	0	388	0	0	0	0	0	109
Lane Group Flow (vph)	162	265	0	1417	493	364	65	487	168	663	452	30
Confl. Peds. (#/hr)			74									5
Confl. Bikes (#/hr)			2			6			4			
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	5%	5%	5%	5%	5%	5%
Turn Type	Split	NA		Split	NA	Perm	Split	NA	custom	Split	NA	Perm
Protected Phases	4	4		7	7		6	6	2 6 7!	2!	2	
Permitted Phases						7						2
Actuated Green, G (s)	23.6	23.6		37.1	37.1	37.1	15.1	15.1	87.5	25.5	25.5	25.5
Effective Green, g (s)	23.6	23.6		37.1	37.1	37.1	15.1	15.1	87.5	25.5	25.5	25.5
Actuated g/C Ratio	0.20	0.20		0.31	0.31	0.31	0.13	0.13	0.73	0.21	0.21	0.21
Clearance Time (s)	4.0	4.0		4.9	4.9	4.9	4.9	4.9		4.9	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	2.5	2.5		2.0	2.0	2.0
Lane Grp Cap (vph)	316	306		946	513	429	194	389	1009	637	657	283
v/s Ratio Prot	0.10	c0.17		c0.46	0.30		0.04	c0.16	0.12	c0.22	0.15	
v/s Ratio Perm						0.26						0.02
v/c Ratio	0.51	0.87		1.50	0.96	0.85	0.34	1.25	0.17	1.04	0.69	0.10
Uniform Delay, d1	43.1	46.7		41.5	40.7	38.8	47.9	52.5	5.0	47.2	43.6	38.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.4	21.8		229.6	29.9	14.4	0.7	133.0	0.1	46.7	5.8	0.7
Delay (s)	44.5	68.5		271.1	70.7	53.2	48.6	185.4	5.1	94.0	49.4	38.8
Level of Service	D	E		F	E	D	D	F	A	F	D	D
Approach Delay (s)		59.7			172.4			131.0			71.8	
Approach LOS		E			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	131.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.7
Intersection Capacity Utilization	117.1%	ICU Level of Service	H
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	66	950	3647	116	30	75
Future Volume (vph)	66	950	3647	116	30	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9	4.9		4.2	4.2
Lane Util. Factor	1.00	0.91	0.91		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1687	4848	2700		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1687	4848	5058		1770	1583
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	67	960	3684	117	30	76
RTOR Reduction (vph)	0	0	2	0	0	69
Lane Group Flow (vph)	67	960	3799	0	30	7
Confl. Peds. (#/hr)				1		
Confl. Bikes (#/hr)				6		
Heavy Vehicles (%)	7%	7%	2%	2%	2%	2%
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	5	2	6		3	
Permitted Phases						3
Actuated Green, G (s)	8.0	70.9	58.9		9.6	9.6
Effective Green, g (s)	8.0	70.9	58.9		9.6	9.6
Actuated g/C Ratio	0.08	0.71	0.59		0.10	0.10
Clearance Time (s)	4.0	4.9	4.9		4.2	4.2
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	134	3437	1590		169	151
v/s Ratio Prot	c0.04	0.20	c1.41		c0.02	
v/s Ratio Perm						0.00
v/c Ratio	0.50	0.28	2.39		0.18	0.05
Uniform Delay, d1	44.1	5.3	20.6		41.6	41.1
Progression Factor	1.00	1.00	1.48		1.00	1.00
Incremental Delay, d2	1.1	0.2	625.3		0.2	0.0
Delay (s)	45.2	5.5	655.7		41.8	41.1
Level of Service	D	A	F		D	D
Approach Delay (s)		8.1	655.7		41.3	
Approach LOS		A	F		D	

Intersection Summary			
HCM 2000 Control Delay	507.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.1
Intersection Capacity Utilization	90.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBU	EBL	EBT	EBR	WBL2	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	4	49	757	244	152	3174	19	2	1650	32	80	8
Future Volume (vph)	4	49	757	244	152	3174	19	2	1650	32	80	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.6		4.0	4.6			4.0	4.0	4.0	
Lane Util. Factor		1.00	0.91		1.00	0.91			0.91	0.91	1.00	
Frpb, ped/bikes		1.00	1.00		1.00	1.00			1.00	1.00	0.94	
Flpb, ped/bikes		1.00	1.00		1.00	1.00			1.00	1.00	1.00	
Frt		1.00	0.96		1.00	1.00			1.00	1.00	0.85	
Flt Protected		0.95	1.00		0.95	1.00			0.95	0.95	1.00	
Satd. Flow (prot)		1597	4408		1770	5079			3189	1603	1478	
Flt Permitted		0.95	1.00		0.95	1.00			0.95	0.95	1.00	
Satd. Flow (perm)		1597	4408		1770	5079			3189	1603	1478	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	4	49	765	246	154	3206	19	2	1667	32	81	8
RTOR Reduction (vph)	0	0	0	0	0	1	0	0	0	0	61	0
Lane Group Flow (vph)	0	53	1011	0	154	3224	0	0	1136	565	20	0
Confl. Peds. (#/hr)							8				37	
Confl. Bikes (#/hr)				2			5				4	
Heavy Vehicles (%)	13%	13%	13%	13%	2%	2%	2%	3%	3%	3%	3%	1%
Turn Type	Prot	Prot	NA		Prot	NA		Split	Split	NA	Perm	Split
Protected Phases	1	1	6		5	2		4	4	4		7
Permitted Phases											4	
Actuated Green, G (s)		7.8	35.1		13.5	40.8			34.0	34.0	34.0	
Effective Green, g (s)		7.8	35.1		13.5	40.8			34.0	34.0	34.0	
Actuated g/C Ratio		0.06	0.26		0.10	0.30			0.25	0.25	0.25	
Clearance Time (s)		4.0	4.6		4.0	4.6			4.0	4.0	4.0	
Vehicle Extension (s)		2.0	3.0		2.0	3.0			2.0	2.0	2.0	
Lane Grp Cap (vph)		91	1139		175	1525			798	401	370	
v/s Ratio Prot		0.03	0.23		c0.09	c0.63			c0.36	0.35		
v/s Ratio Perm											0.01	
v/c Ratio		0.58	0.89		0.88	2.11			1.42	1.41	0.05	
Uniform Delay, d1		62.4	48.5		60.4	47.5			50.9	50.9	38.7	
Progression Factor		1.00	1.00		1.00	1.00			1.00	1.00	1.00	
Incremental Delay, d2		6.0	8.6		35.6	503.7			197.9	198.4	0.0	
Delay (s)		68.4	57.1		96.0	551.2			248.8	249.3	38.7	
Level of Service		E	E		F	F			F	F	D	
Approach Delay (s)			57.6			530.4				239.4		
Approach LOS			E			F				F		

Intersection Summary			
HCM 2000 Control Delay	320.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.44		
Actuated Cycle Length (s)	135.8	Sum of lost time (s)	21.1
Intersection Capacity Utilization	140.3%	ICU Level of Service	H
Analysis Period (min)	15		
dr Defacto Right Lane. Recode with 1 though lane as a right lane.			
c Critical Lane Group			

Movement	SBT	SBR2	NER	NER2
Lane Configurations				
Traffic Volume (vph)	27	431	444	176
Future Volume (vph)	27	431	444	176
Ideal Flow (vphpl)	1900	1900	1990	1900
Total Lost time (s)	4.0		4.5	4.5
Lane Util. Factor	0.95		*0.95	1.00
Frpb, ped/bikes	0.96		1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00
Frt	0.86		1.00	0.85
Flt Protected	1.00		1.00	1.00
Satd. Flow (prot)	2963		3376	1442
Flt Permitted	1.00		1.00	1.00
Satd. Flow (perm)	2963		3376	1442
Peak-hour factor, PHF	0.99	0.99	0.99	0.99
Adj. Flow (vph)	27	435	448	178
RTOR Reduction (vph)	372	0	0	0
Lane Group Flow (vph)	98	0	448	178
Confl. Peds. (#/hr)				54
Confl. Bikes (#/hr)		8		
Heavy Vehicles (%)	1%	1%	12%	12%
Turn Type	NA		Prot	Prot
Protected Phases	7		3	3
Permitted Phases				
Actuated Green, G (s)	8.8		23.3	23.3
Effective Green, g (s)	8.8		23.3	23.3
Actuated g/C Ratio	0.06		0.17	0.17
Clearance Time (s)	4.0		4.5	4.5
Vehicle Extension (s)	2.0		2.0	2.0
Lane Grp Cap (vph)	192		579	247
v/s Ratio Prot	c0.03		c0.13	0.12
v/s Ratio Perm				
v/c Ratio	0.92dr		0.77	0.72
Uniform Delay, d1	61.4		53.7	53.2
Progression Factor	1.00		1.00	1.00
Incremental Delay, d2	0.8		5.8	8.5
Delay (s)	62.2		59.6	61.6
Level of Service	E		E	E
Approach Delay (s)	62.2			
Approach LOS	E			

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	174	3	1	861	61	3	1	1	27	1	421
Future Volume (vph)	113	174	3	1	861	61	3	1	1	27	1	421
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			0.95	0.95
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.99			0.97			0.87	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.99	1.00
Satd. Flow (prot)	1492	2975		1656	3273			1795			1484	1461
Flt Permitted	0.95	1.00		0.95	1.00			0.64			0.96	1.00
Satd. Flow (perm)	1492	2975		1656	3273			1174			1431	1461
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	114	176	3	1	870	62	3	1	1	27	1	425
RTOR Reduction (vph)	0	0	0	0	0	0	0	1	0	0	181	204
Lane Group Flow (vph)	114	179	0	1	932	0	0	4	0	0	47	21
Confl. Peds. (#/hr)			1			2						
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	21%	21%	21%	9%	9%	9%	0%	0%	0%	5%	5%	5%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			3			4	
Permitted Phases							3			4		4
Actuated Green, G (s)	11.6	48.5		0.8	37.7			19.4			8.7	8.7
Effective Green, g (s)	11.6	48.5		0.8	37.7			19.4			8.7	8.7
Actuated g/C Ratio	0.12	0.52		0.01	0.40			0.21			0.09	0.09
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Vehicle Extension (s)	2.0	2.5		2.0	2.5			2.0			2.0	2.0
Lane Grp Cap (vph)	185	1544		14	1321			243			133	136
v/s Ratio Prot	c0.08	0.06		0.00	c0.28							
v/s Ratio Perm								c0.00			c0.03	0.01
v/c Ratio	0.62	0.12		0.07	0.71			0.02			0.35	0.15
Uniform Delay, d1	38.8	11.5		45.9	23.2			29.4			39.7	39.0
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	4.2	0.0		0.8	1.6			0.1			0.6	0.2
Delay (s)	43.0	11.5		46.7	24.8			29.6			40.3	39.2
Level of Service	D	B		D	C			C			D	D
Approach Delay (s)		23.8			24.9			29.6			39.7	
Approach LOS		C			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	28.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	93.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Intersection Delay, s/veh	199.6
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	911	145	211	265	10	63	16	135	9	7	25
Future Vol, veh/h	21	911	145	211	265	10	63	16	135	9	7	25
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles, %	4	4	4	10	10	10	16	16	16	50	50	50
Mvmt Flow	22	969	154	224	282	11	67	17	144	10	7	27
Number of Lanes	0	1	1	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	325.4	18	14.3	14.3
HCM LOS	F	C	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	80%	0%	2%	0%	100%	0%	22%
Vol Thru, %	20%	0%	98%	0%	0%	96%	17%
Vol Right, %	0%	100%	0%	100%	0%	4%	61%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	79	135	932	145	211	275	41
LT Vol	63	0	21	0	211	0	9
Through Vol	16	0	911	0	0	265	7
RT Vol	0	135	0	145	0	10	25
Lane Flow Rate	84	144	991	154	224	293	44
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.194	0.288	1.78	0.246	0.449	0.542	0.106
Departure Headway (Hd)	9.424	8.283	6.463	5.739	8.016	7.476	10.106
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	383	437	565	626	453	486	357
Service Time	7.124	5.983	4.197	3.473	5.716	5.176	8.106
HCM Lane V/C Ratio	0.219	0.33	1.754	0.246	0.494	0.603	0.123
HCM Control Delay	14.4	14.3	374.4	10.3	17.1	18.7	14.3
HCM Lane LOS	B	B	F	B	C	C	B
HCM 95th-tile Q	0.7	1.2	60.2	1	2.3	3.2	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	0	43	14	0	44	42	594	3	52	1105	271
Future Volume (veh/h)	60	0	43	14	0	44	42	594	3	52	1105	271
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.96		0.96	0.96		0.96	1.00		0.96	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1781	1781	1781	1796	1796	1796	1767	1767	1767
Adj Flow Rate, veh/h	61	0	6	14	0	6	42	600	3	53	1116	258
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	5	5	5	8	8	8	7	7	7	9	9	9
Cap, veh/h	282	0	215	278	0	209	106	2094	10	120	1640	376
Arrive On Green	0.14	0.00	0.14	0.14	0.00	0.14	0.06	0.60	0.60	0.07	0.61	0.61
Sat Flow, veh/h	1323	0	1486	1291	0	1450	1711	3481	17	1682	2686	616
Grp Volume(v), veh/h	61	0	6	14	0	6	42	294	309	53	694	680
Grp Sat Flow(s),veh/h/ln	1323	0	1486	1291	0	1450	1711	1706	1792	1682	1678	1623
Q Serve(g_s), s	3.1	0.0	0.3	0.7	0.0	0.3	1.8	6.2	6.2	2.3	20.6	21.1
Cycle Q Clear(g_c), s	3.4	0.0	0.3	1.0	0.0	0.3	1.8	6.2	6.2	2.3	20.6	21.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.01	1.00		0.38
Lane Grp Cap(c), veh/h	282	0	215	278	0	209	106	1027	1078	120	1025	991
V/C Ratio(X)	0.22	0.00	0.03	0.05	0.00	0.03	0.39	0.29	0.29	0.44	0.68	0.69
Avail Cap(c_a), veh/h	619	0	593	606	0	578	237	1027	1078	233	1025	991
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.71	0.71	0.71
Uniform Delay (d), s/veh	29.0	0.0	27.6	28.0	0.0	27.6	33.8	7.2	7.2	33.4	9.7	9.8
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.0	0.0	0.0	0.9	0.7	0.7	0.7	2.6	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.1	0.2	0.0	0.1	0.7	2.1	2.2	0.9	6.9	6.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.2	0.0	27.6	28.0	0.0	27.6	34.7	7.9	7.9	34.1	12.3	12.6
LnGrp LOS	C	A	C	C	A	C	C	A	A	C	B	B
Approach Vol, veh/h		67			20			645			1427	
Approach Delay, s/veh		29.0			27.9			9.6			13.2	
Approach LOS		C			C			A			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.3	50.2		15.4	8.7	50.9		15.4				
Change Period (Y+Rc), s	4.0	5.1		4.6	4.0	5.1		4.6				
Max Green Setting (Gmax), s	10.4	21.0		29.9	10.4	21.0		29.9				
Max Q Clear Time (g_c+I1), s	4.3	8.2		5.4	3.8	23.1		3.0				
Green Ext Time (p_c), s	0.0	2.0		0.1	0.0	0.0		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			12.8									
HCM 6th LOS			B									

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	2062	133	16	757	216	722
Future Volume (veh/h)	2062	133	16	757	216	722
Initial Q (Qb), veh	45	0	0	0	10	51
Ped-Bike Adj(A_pbT)		0.95	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1707	1707	1811	1811
Adj Flow Rate, veh/h	2083	128	16	765	218	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	4	4	13	13	6	6
Cap, veh/h	3252	173	35	3436	293	
Arrive On Green	0.23	0.23	0.02	0.77	0.15	0.00
Sat Flow, veh/h	4992	295	1626	4815	1725	2701
Grp Volume(v), veh/h	1441	770	16	765	218	0
Grp Sat Flow(s),veh/h/ln	1675	1771	1626	1554	1725	1351
Q Serve(g_s), s	38.4	38.9	1.0	4.5	12.3	0.0
Cycle Q Clear(g_c), s	38.4	38.9	1.0	4.5	12.3	0.0
Prop In Lane		0.17	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2233	1195	35	3436	293	
V/C Ratio(X)	0.65	0.64	0.46	0.22	0.74	
Avail Cap(c_a), veh/h	2374	1255	130	3590	517	
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.85	0.85	0.95	0.95	1.00	0.00
Uniform Delay (d), s/veh	30.0	29.7	48.3	4.4	40.5	0.0
Incr Delay (d2), s/veh	1.2	2.3	3.3	0.1	3.7	0.0
Initial Q Delay(d3),s/veh	3.7	3.2	0.0	0.0	32.7	0.0
%ile BackOfQ(50%),veh/ln	20.8	22.3	0.4	1.4	9.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	34.9	35.2	51.6	4.5	77.0	0.0
LnGrp LOS	C	D	D	A	E	
Approach Vol, veh/h	2211			781	218	A
Approach Delay, s/veh	35.0			5.5	77.0	
Approach LOS	D			A	E	

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.2	74.9				81.0		19.0
Change Period (Y+Rc), s	4.0	4.0				4.0		4.0
Max Green Setting (Gmax), s	8.0	50.0				62.0		30.0
Max Q Clear Time (g_c+I1), s	3.0	40.9				6.5		14.3
Green Ext Time (p_c), s	0.0	6.7				3.9		0.7

Intersection Summary			
HCM 6th Ctrl Delay			30.7
HCM 6th LOS			C

Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	172	2325	287	531	546	104	115	167	738	265	181	112
Future Volume (veh/h)	172	2325	287	531	546	104	115	167	738	265	181	112
Initial Q (Qb), veh	5	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1633	1633	1633	1752	1752	1752	1767	1767	1767
Adj Flow Rate, veh/h	174	2348	204	536	552	88	116	169	0	268	183	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	4	4	4	18	18	18	10	10	10	9	9	9
Cap, veh/h	214	2802	844	302	1942	304	154	205		179	440	
Arrive On Green	0.11	0.56	0.56	0.10	0.54	0.54	0.09	0.12	0.00	0.11	0.13	0.00
Sat Flow, veh/h	1753	5025	1514	3018	3875	606	1668	1752	1485	1682	3357	1497
Grp Volume(v), veh/h	174	2348	204	536	421	219	116	169	0	268	183	0
Grp Sat Flow(s),veh/h/ln	1753	1675	1514	1509	1486	1509	1668	1752	1485	1682	1678	1497
Q Serve(g_s), s	14.7	58.2	10.3	15.0	11.3	11.6	10.2	14.1	0.0	16.0	7.5	0.0
Cycle Q Clear(g_c), s	14.7	58.2	10.3	15.0	11.3	11.6	10.2	14.1	0.0	16.0	7.5	0.0
Prop In Lane	1.00		1.00	1.00		0.40	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	214	2802	844	302	1490	756	154	205		179	440	
V/C Ratio(X)	0.81	0.84	0.24	1.78	0.28	0.29	0.75	0.82		1.49	0.42	
Avail Cap(c_a), veh/h	304	2802	844	302	1620	822	200	445		179	815	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.58	0.58	0.58	0.86	0.86	0.86	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	65.0	27.6	17.0	67.5	21.8	21.9	66.4	64.7	0.0	67.0	59.9	0.0
Incr Delay (d2), s/veh	4.3	1.9	0.4	360.7	0.4	0.8	7.5	3.2	0.0	249.1	0.2	0.0
Initial Q Delay(d3),s/veh	21.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.9	23.3	3.7	20.9	4.5	4.8	4.6	6.5	0.0	19.3	3.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	90.5	29.4	17.4	428.2	22.2	22.7	73.8	67.9	0.0	316.1	60.1	0.0
LnGrp LOS	F	C	B	F	C	C	E	E		F	E	
Approach Vol, veh/h		2726			1176			285	A		451	A
Approach Delay, s/veh		32.4			207.3			70.3			212.2	
Approach LOS		C			F			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	88.5	17.9	24.6	20.9	86.6	20.0	22.5
Change Period (Y+Rc), s	4.0	4.9	4.0	* 4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	15.0	63.1	18.0	* 36	26.0	52.1	16.0	38.1
Max Q Clear Time (g_c+I1), s	17.0	60.2	12.2	9.5	16.7	13.6	18.0	16.1
Green Ext Time (p_c), s	0.0	2.6	0.1	0.7	0.2	2.9	0.0	0.5

Intersection Summary			
HCM 6th Ctrl Delay			96.6
HCM 6th LOS			F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	546	2599	183	34	644	18	168	724	260	195	84	369
Future Volume (veh/h)	546	2599	183	34	644	18	168	724	260	195	84	369
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.94	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1618	1618	1618	1752	1752	1752	1663	1663	1663
Adj Flow Rate, veh/h	552	2625	185	34	651	17	170	731	169	197	85	50
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	6	6	6	19	19	19	10	10	10	16	16	16
Cap, veh/h	911	2263	681	211	1105	29	316	630	276	253	266	383
Arrive On Green	0.27	0.46	0.46	0.07	0.25	0.25	0.19	0.19	0.19	0.16	0.16	0.16
Sat Flow, veh/h	3346	4944	1489	2990	4420	115	1668	3328	1458	1584	1663	2397
Grp Volume(v), veh/h	552	2625	185	34	433	235	170	731	169	197	85	50
Grp Sat Flow(s),veh/h/ln	1673	1648	1489	1495	1473	1590	1668	1664	1458	1584	1663	1198
Q Serve(g_s), s	21.6	68.6	11.5	1.6	19.4	19.5	13.8	28.4	15.9	17.9	6.8	2.7
Cycle Q Clear(g_c), s	21.6	68.6	11.5	1.6	19.4	19.5	13.8	28.4	15.9	17.9	6.8	2.7
Prop In Lane	1.00		1.00	1.00		0.07	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	911	2263	681	211	736	397	316	630	276	253	266	383
V/C Ratio(X)	0.61	1.16	0.27	0.16	0.59	0.59	0.54	1.16	0.61	0.78	0.32	0.13
Avail Cap(c_a), veh/h	911	2263	681	279	736	397	316	630	276	382	401	578
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.09	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.6	40.7	25.2	65.5	49.5	49.5	54.9	60.8	55.8	60.5	55.8	54.1
Incr Delay (d2), s/veh	0.1	72.6	0.1	0.1	3.4	6.3	1.0	88.8	2.9	2.7	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.0	42.3	4.1	0.6	7.5	8.5	5.9	19.7	6.1	7.4	2.9	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.7	113.3	25.3	65.6	52.9	55.8	55.9	149.6	58.7	63.1	56.1	54.1
LnGrp LOS	D	F	C	E	D	E	E	F	E	E	E	D
Approach Vol, veh/h		3362			702			1070			332	
Approach Delay, s/veh		97.7			54.5			120.3			60.0	
Approach LOS		F			D			F			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	45.7	42.4		28.9	14.6	73.5		33.0				
Change Period (Y+Rc), s	4.9	* 4.9		4.9	4.0	4.9		4.6				
Max Green Setting (Gmax), s	30.0	* 38		36.2	14.0	53.5		28.4				
Max Q Clear Time (g_c+I1), s	23.6	21.5		19.9	3.6	70.6		30.4				
Green Ext Time (p_c), s	1.5	2.6		0.8	0.0	0.0		0.0				

Intersection Summary			
HCM 6th Ctrl Delay			94.3
HCM 6th LOS			F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	156	366	456	37	417	30	466	1041	1265	22	116	658
Future Volume (veh/h)	156	366	456	37	417	30	466	1041	1265	22	116	658
Initial Q (Qb), veh	0	13	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		1.00	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1722	1722	1722	1574	1574	1574	1811	1811	1811	1663	1663	1663
Adj Flow Rate, veh/h	158	370	90	37	421	3	471	1052	0	22	117	272
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	12	12	12	22	22	22	6	6	6	16	16	16
Cap, veh/h	493	410	592	94	603	181	1277	1313		230	241	344
Arrive On Green	0.05	0.08	0.08	0.06	0.14	0.14	0.39	0.39	0.00	0.14	0.14	0.14
Sat Flow, veh/h	3182	1722	2485	1499	4297	1288	3346	3532	0	1584	1663	2376
Grp Volume(v), veh/h	158	370	90	37	421	3	471	1052	0	22	117	272
Grp Sat Flow(s),veh/h/ln	1591	1722	1242	1499	1432	1288	1673	1721	0	1584	1663	1188
Q Serve(g_s), s	5.0	22.4	3.6	2.5	9.8	0.2	10.6	28.4	0.0	1.3	6.8	11.6
Cycle Q Clear(g_c), s	5.0	22.4	3.6	2.5	9.8	0.2	10.6	28.4	0.0	1.3	6.8	11.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	493	410	592	94	603	181	1277	1313		230	241	344
V/C Ratio(X)	0.32	0.90	0.15	0.39	0.70	0.02	0.37	0.80		0.10	0.49	0.79
Avail Cap(c_a), veh/h	480	410	592	143	1023	307	1291	1327		347	364	521
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.63	0.63	0.63	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.5	48.4	38.5	47.3	43.0	38.9	23.4	28.9	0.0	38.9	41.3	43.3
Incr Delay (d2), s/veh	0.1	15.7	0.1	1.0	0.6	0.0	0.8	5.2	0.0	0.1	0.6	2.3
Initial Q Delay(d3),s/veh	0.0	70.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	21.3	1.1	1.0	3.5	0.1	4.2	12.3	0.0	0.5	2.8	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.6	134.3	38.5	48.3	43.6	38.9	24.2	34.1	0.0	39.0	41.8	45.7
LnGrp LOS	D	F	D	D	D	D	C	C		D	D	D
Approach Vol, veh/h		618			461			1523	A		411	
Approach Delay, s/veh		97.4			43.9			31.0			44.2	
Approach LOS		F			D			C			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.6	29.2		45.1	20.5	19.3		20.1				
Change Period (Y+Rc), s	4.0	4.6		4.6	4.6	* 4.6		4.9				
Max Green Setting (Gmax), s	10.0	25.0		28.9	10.0	* 25		23.0				
Max Q Clear Time (g_c+I1), s	4.5	24.4		30.4	7.0	11.8		13.6				
Green Ext Time (p_c), s	0.0	0.2		0.0	0.1	1.6		1.0				
Intersection Summary												
HCM 6th Ctrl Delay			48.4									
HCM 6th LOS			D									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	122	289	149	1025	261	282	192	46	520	202	783	99
Future Volume (veh/h)	122	289	149	1025	261	282	192	46	520	202	783	99
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1441	1441	1441	1618	1618	1618	1796	1796	1796	1811	1811	1811
Adj Flow Rate, veh/h	123	292	0	1035	264	0	194	46	0	204	791	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	31	31	31	19	19	19	7	7	7	6	6	6
Cap, veh/h	180	378		1093	407		196	453		524	1138	
Arrive On Green	0.13	0.13	0.00	0.08	0.08	0.00	0.11	0.13	0.00	0.30	0.33	0.00
Sat Flow, veh/h	1372	2881	1221	4347	1618	1372	1711	3413	1522	1725	3441	1535
Grp Volume(v), veh/h	123	292	0	1035	264	0	194	46	0	204	791	0
Grp Sat Flow(s),veh/h/ln	1372	1441	1221	1449	1618	1372	1711	1706	1522	1725	1721	1535
Q Serve(g_s), s	9.0	10.3	0.0	24.9	16.6	0.0	11.9	1.2	0.0	9.8	21.0	0.0
Cycle Q Clear(g_c), s	9.0	10.3	0.0	24.9	16.6	0.0	11.9	1.2	0.0	9.8	21.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	180	378		1093	407		196	453		524	1138	
V/C Ratio(X)	0.68	0.77		0.95	0.65		0.99	0.10		0.39	0.70	
Avail Cap(c_a), veh/h	287	604		1093	407		196	686		524	1138	
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.70	0.70	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	43.5	44.1	0.0	47.4	43.7	0.0	46.5	40.0	0.0	28.9	30.5	0.0
Incr Delay (d2), s/veh	1.7	1.3	0.0	12.4	2.5	0.0	61.9	0.0	0.0	0.2	3.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	3.7	0.0	10.9	7.5	0.0	8.3	0.5	0.0	4.0	9.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.2	45.4	0.0	59.9	46.2	0.0	108.4	40.1	0.0	29.1	34.1	0.0
LnGrp LOS	D	D		E	D		F	D		C	C	
Approach Vol, veh/h		415	A		1299	A		240	A		995	A
Approach Delay, s/veh		45.3			57.1			95.3			33.0	
Approach LOS		D			E			F			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	16.0	39.6		18.4	36.8	18.8		31.0
Change Period (Y+Rc), s	4.0	4.9		4.6	4.9	* 4.9		4.6
Max Green Setting (Gmax), s	12.0	26.5		22.0	17.4	* 21		26.4
Max Q Clear Time (g_c+I1), s	13.9	23.0		12.3	11.8	3.2		26.9
Green Ext Time (p_c), s	0.0	1.8		1.1	0.2	0.1		0.0

Intersection Summary	
HCM 6th Ctrl Delay	50.4
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	0	34	3	0	25	41	675	5	52	1419	155
Future Volume (veh/h)	61	0	34	3	0	25	41	675	5	52	1419	155
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.96		1.00	0.96		1.00	1.00		0.96	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1752	1752	1752	1500	1500	1500	1707	1707	1707	1796	1796	1796
Adj Flow Rate, veh/h	62	0	-4	3	0	0	41	682	5	53	1433	151
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	10	10	10	27	27	27	13	13	13	7	7	7
Cap, veh/h	281	0	218	0	0	0	50	2144	16	66	2044	213
Arrive On Green	0.15	0.00	0.00	0.15	0.00	0.00	0.03	0.65	0.65	0.04	0.66	0.66
Sat Flow, veh/h	1268	0	1485	0	0	0	1626	3300	24	1711	3105	324
Grp Volume(v), veh/h	62	0	-4	3	0	0	41	335	352	53	782	802
Grp Sat Flow(s),veh/h/ln	1268	0	1485	0	0	0	1626	1622	1702	1711	1706	1722
Q Serve(g_s), s	3.3	0.0	0.0	0.0	0.0	0.0	1.9	6.9	6.9	2.3	22.0	22.6
Cycle Q Clear(g_c), s	3.3	0.0	0.0	0.0	0.0	0.0	1.9	6.9	6.9	2.3	22.0	22.6
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.01	1.00		0.19
Lane Grp Cap(c), veh/h	281	0	218	0	0	0	50	1054	1106	66	1123	1134
V/C Ratio(X)	0.22	0.00	-0.02	0.00	0.00	0.00	0.83	0.32	0.32	0.80	0.70	0.71
Avail Cap(c_a), veh/h	495	0	469	0	0	0	514	1054	1106	540	1123	1134
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.1	0.0	0.0	0.0	0.0	0.0	36.6	5.9	5.9	36.2	8.2	8.3
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.0	0.0	0.0	12.1	0.8	0.8	7.9	3.6	3.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	0.0	0.0	0.0	0.9	2.1	2.2	1.1	7.3	7.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.2	0.0	0.0	0.0	0.0	0.0	48.7	6.7	6.6	44.1	11.8	12.0
LnGrp LOS	C	A	A	A	A	A	D	A	A	D	B	B
Approach Vol, veh/h		58			3			728			1637	
Approach Delay, s/veh		31.2			0.0			9.0			12.9	
Approach LOS		C			A			A			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.9	53.9		15.1	6.3	54.5		15.1				
Change Period (Y+Rc), s	4.0	4.5		4.0	4.0	4.5		4.0				
Max Green Setting (Gmax), s	24.0	30.0		24.0	24.0	50.0		24.0				
Max Q Clear Time (g_c+I1), s	4.3	8.9		5.3	3.9	24.6		2.0				
Green Ext Time (p_c), s	0.0	2.8		0.1	0.0	9.2		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			12.2									
HCM 6th LOS			B									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	501	1984	642	465	222	769	227	64	1192	0	0	0
Future Volume (veh/h)	501	1984	642	465	222	769	227	64	1192	0	0	0
Initial Q (Qb), veh	16	8	16	0	0	0	0	0	10			
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	1870	1648	1648	1648	1856	1856	1856			
Adj Flow Rate, veh/h	506	2004	447	470	224	307	229	65	1204			
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99			
Percent Heavy Veh, %	2	2	2	17	17	17	3	3	3			
Cap, veh/h	642	1914	790	415	731	1090	805	828	1026			
Arrive On Green	0.17	0.51	0.51	0.14	0.48	0.48	0.23	0.23	0.23			
Sat Flow, veh/h	3563	3741	1544	3045	1648	2458	3428	3526	2768			
Grp Volume(v), veh/h	506	2004	447	470	224	307	229	65	1204			
Grp Sat Flow(s),veh/h/ln	1781	1870	1544	1522	1648	1229	1714	1763	1384			
Q Serve(g_s), s	14.7	54.5	21.2	14.5	8.7	7.9	5.8	1.5	25.0			
Cycle Q Clear(g_c), s	14.7	54.5	21.2	14.5	8.7	7.9	5.8	1.5	25.0			
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	642	1914	790	415	731	1090	805	828	1026			
V/C Ratio(X)	0.79	1.05	0.57	1.13	0.31	0.28	0.28	0.08	1.17			
Avail Cap(c_a), veh/h	789	1914	790	415	791	1180	805	828	1026			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	42.6	26.0	19.4	46.0	19.1	18.9	33.4	31.8	33.5			
Incr Delay (d2), s/veh	4.0	34.1	1.2	85.9	0.3	0.2	0.1	0.0	88.3			
Initial Q Delay(d3),s/veh	21.2	15.0	6.8	0.0	0.0	0.0	0.0	0.0	35.1			
%ile BackOfQ(50%),veh/ln	9.6	36.1	11.3	10.4	3.6	2.4	2.5	0.7	42.3			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.8	75.1	27.3	131.9	19.5	19.1	33.5	31.8	156.9			
LnGrp LOS	E	F	C	F	B	B	C	C	F			
Approach Vol, veh/h		2957			1001			1498				
Approach Delay, s/veh		66.7			72.2			132.6				
Approach LOS		E			E			F				

Timer - Assigned Phs	1	2		4	5	6			
Phs Duration (G+Y+Rc), s	18.0	59.5		29.0	21.4	56.1			
Change Period (Y+Rc), s	3.5	5.0		4.0	3.5	5.0			
Max Green Setting (Gmax), s	14.5	54.5		25.0	23.6	45.4			
Max Q Clear Time (g_c+I1), s	16.5	56.5		27.0	16.7	10.7			
Green Ext Time (p_c), s	0.0	0.0		0.0	1.2	5.7			

Intersection Summary			
HCM 6th Ctrl Delay			85.8
HCM 6th LOS			F

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	773	3098	95	4	803	25	60	4	10	42	2	93
Future Volume (veh/h)	773	3098	95	4	803	25	60	4	10	42	2	93
Initial Q (Qb), veh	0	32	0	0	26	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.99	1.00		0.95	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1574	1574	1574	1366	1366	1366	1678	1678	1678
Adj Flow Rate, veh/h	781	3129	95	4	811	23	61	4	1	42	2	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	3	3	3	22	22	22	36	36	36	15	15	15
Cap, veh/h	779	2400	63	9	1996	53	153	123	31	62	3	101
Arrive On Green	0.23	0.68	0.68	0.01	0.46	0.46	0.12	0.12	0.12	0.04	0.04	0.00
Sat Flow, veh/h	3428	3489	105	1499	4293	122	1301	1042	260	1528	73	2502
Grp Volume(v), veh/h	781	1571	1653	4	541	293	61	0	5	44	0	0
Grp Sat Flow(s),veh/h/ln	1714	1763	1832	1499	1432	1550	1301	0	1302	1601	0	1251
Q Serve(g_s), s	25.0	75.3	75.3	0.3	13.7	13.8	4.8	0.0	0.4	3.0	0.0	0.0
Cycle Q Clear(g_c), s	25.0	75.3	75.3	0.3	13.7	13.8	4.8	0.0	0.4	3.0	0.0	0.0
Prop In Lane	1.00		0.06	1.00		0.08	1.00		0.20	0.95		1.00
Lane Grp Cap(c), veh/h	779	1207	1256	9	1328	719	153	0	153	65	0	101
V/C Ratio(X)	1.00	1.30	1.32	0.43	0.41	0.41	0.40	0.00	0.03	0.68	0.00	0.00
Avail Cap(c_a), veh/h	779	1207	1254	82	1328	719	367	0	367	87	0	136
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.09	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	42.5	17.3	17.3	54.5	20.4	20.3	44.9	0.0	43.0	52.1	0.0	0.0
Incr Delay (d2), s/veh	10.2	136.2	142.8	10.9	0.9	1.7	0.6	0.0	0.0	5.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	47.7	45.9	0.0	2.1	1.8	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.4	86.6	91.8	0.1	6.0	6.5	1.6	0.0	0.1	1.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.7	201.3	206.0	65.4	23.4	23.8	45.5	0.0	43.0	57.1	0.0	0.0
LnGrp LOS	F	F	F	E	C	C	D	A	D	E	A	A
Approach Vol, veh/h		4005			838			66			44	
Approach Delay, s/veh		174.3			23.7			45.3			57.1	
Approach LOS		F			C			D			E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	29.0	55.6		17.0	4.7	79.9		8.4				
Change Period (Y+Rc), s	4.0	4.6		4.0	4.0	4.6		4.0				
Max Green Setting (Gmax), s	25.0	31.4		31.0	6.0	50.4		6.0				
Max Q Clear Time (g_c+I1), s	27.0	15.8		6.8	2.3	77.3		5.0				
Green Ext Time (p_c), s	0.0	4.7		0.1	0.0	0.0		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			146.1									
HCM 6th LOS			F									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	1725	38	106	181	162	23	205	585	817	328	211
Future Volume (veh/h)	142	1725	38	106	181	162	23	205	585	817	328	211
Initial Q (Qb), veh	0	50	0	0	0	0	0	0	12	24	24	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1826	1826	1826	1870	1870	1870	1826	1826	1826
Adj Flow Rate, veh/h	143	1742	35	107	183	39	23	207	591	825	331	61
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	1	1	5	5	5	2	2	2	5	5	5
Cap, veh/h	180	1912	12	674	1357	283	80	274	641	919	523	435
Arrive On Green	0.10	0.36	0.36	0.07	0.35	0.35	0.05	0.14	0.14	0.19	0.28	0.28
Sat Flow, veh/h	1795	5190	104	3374	2857	596	1781	1870	2790	4904	1826	1505
Grp Volume(v), veh/h	143	1151	626	107	110	112	23	207	591	825	331	61
Grp Sat Flow(s),veh/h/ln	1795	1716	1864	1687	1735	1719	1781	1870	1395	1635	1826	1505
Q Serve(g_s), s	6.2	25.8	25.8	2.4	3.5	3.6	1.0	8.6	8.3	13.1	12.7	2.4
Cycle Q Clear(g_c), s	6.2	25.8	25.8	2.4	3.5	3.6	1.0	8.6	8.3	13.1	12.7	2.4
Prop In Lane	1.00		0.06	1.00		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	180	1244	681	674	824	816	80	274	641	919	523	435
V/C Ratio(X)	0.80	0.93	0.92	0.16	0.13	0.14	0.29	0.75	0.92	0.90	0.63	0.14
Avail Cap(c_a), veh/h	292	1244	676	253	606	600	200	281	625	919	513	423
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.97	0.97	0.97	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.2	25.5	25.5	26.7	12.0	12.1	37.0	32.8	16.4	32.5	26.7	21.1
Incr Delay (d2), s/veh	3.1	13.0	19.5	0.0	0.3	0.3	0.7	9.6	19.3	11.2	2.0	0.1
Initial Q Delay(d3),s/veh	0.0	63.0	51.7	0.0	0.0	0.0	0.0	0.0	32.6	47.7	41.4	0.0
%ile BackOfQ(50%),veh/ln	2.8	24.3	25.7	0.8	1.0	1.1	0.4	4.4	6.6	10.7	13.6	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.3	101.5	96.7	26.8	12.4	12.4	37.7	42.4	68.3	91.4	70.1	21.1
LnGrp LOS	D	F	F	C	B	B	D	D	E	F	E	C
Approach Vol, veh/h		1920			329			821			1217	
Approach Delay, s/veh		95.3			17.1			60.9			82.1	
Approach LOS		F			B			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.6	27.5	12.0	32.9	19.0	16.1	10.9	34.0
Change Period (Y+Rc), s	4.0	5.0	4.0	5.0	4.0	5.0	5.0	* 5
Max Green Setting (Gmax), s	9.0	18.0	13.0	22.0	15.0	12.0	6.0	* 29
Max Q Clear Time (g_c+I1), s	3.0	14.7	8.2	5.6	15.1	10.6	4.4	27.8
Green Ext Time (p_c), s	0.0	0.5	0.1	0.6	0.0	0.5	0.0	1.0

Intersection Summary	
HCM 6th Ctrl Delay	78.9
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

User approved changes to right turn type.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1364	2	74	1	0	5	40	114	3	2	150	955
Future Volume (veh/h)	1364	2	74	1	0	5	40	114	3	2	150	955
Initial Q (Qb), veh	24	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1411	1411	1411	1781	1781	1781	1767	1767	1767
Adj Flow Rate, veh/h	1378	2	34	1	0	0	40	115	3	2	152	675
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	3	3	3	33	33	33	8	8	8	9	9	9
Cap, veh/h	1765	45	771	3	0	0	57	514	13	73	361	1897
Arrive On Green	0.50	0.50	0.50	0.00	0.00	0.00	0.03	0.31	0.31	0.21	0.21	0.21
Sat Flow, veh/h	3428	88	1498	1344	0	0	1697	1726	45	6	1758	2635
Grp Volume(v), veh/h	1378	0	36	1	0	0	40	0	118	154	0	675
Grp Sat Flow(s),veh/h/ln	1714	0	1586	1344	0	0	1697	0	1771	1764	0	1317
Q Serve(g_s), s	16.5	0.0	0.6	0.0	0.0	0.0	1.1	0.0	2.4	0.0	0.0	4.9
Cycle Q Clear(g_c), s	16.5	0.0	0.6	0.0	0.0	0.0	1.1	0.0	2.4	3.7	0.0	4.9
Prop In Lane	1.00		0.94	1.00		0.00	1.00		0.03	0.01		1.00
Lane Grp Cap(c), veh/h	1765	0	817	3	0	0	57	0	527	433	0	1897
V/C Ratio(X)	0.78	0.00	0.04	0.38	0.00	0.00	0.70	0.00	0.22	0.36	0.00	0.36
Avail Cap(c_a), veh/h	4791	0	2216	177	0	0	209	0	1223	964	0	2638
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.7	0.0	6.1	26.5	0.0	0.0	25.4	0.0	14.4	18.7	0.0	2.7
Incr Delay (d2), s/veh	0.3	0.0	0.0	71.4	0.0	0.0	14.1	0.0	0.2	0.5	0.0	0.1
Initial Q Delay(d3),s/veh	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.6	0.0	0.2	0.1	0.0	0.0	0.7	0.0	1.0	1.6	0.0	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.1	0.0	6.2	97.9	0.0	0.0	39.5	0.0	14.6	19.2	0.0	2.8
LnGrp LOS	B	A	A	F	A	A	D	A	B	B	A	A
Approach Vol, veh/h		1414			1			158			829	
Approach Delay, s/veh		16.8			97.9			20.9			5.8	
Approach LOS		B			F			C			A	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	4.7	13.8		3.1		18.5		27.1				
Change Period (Y+Rc), s	3.0	3.5		3.0		3.5		3.0				
Max Green Setting (Gmax), s	6.0	24.6		6.4		33.6		68.0				
Max Q Clear Time (g_c+I1), s	3.1	6.9		2.0		4.4		18.5				
Green Ext Time (p_c), s	0.0	3.4		0.0		0.3		5.6				
Intersection Summary												
HCM 6th Ctrl Delay			13.3									
HCM 6th LOS			B									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	186	297	119	445	199	154	35	434	469	1483	556	124
Future Volume (vph)	186	297	119	445	199	154	35	434	469	1483	556	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
Lane Util. Factor	1.00	1.00		0.97	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.97		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1593	1564		2814	1527	1298	1464	2927	1309	3030	3124	1281
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1593	1564		2814	1527	1298	1464	2927	1309	3030	3124	1281
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	188	300	120	449	201	156	35	438	474	1498	562	125
RTOR Reduction (vph)	0	14	0	0	0	137	0	0	0	0	0	83
Lane Group Flow (vph)	188	406	0	449	201	19	35	438	474	1498	562	42
Confl. Peds. (#/hr)			58									20
Confl. Bikes (#/hr)			9						3			3
Heavy Vehicles (%)	2%	2%	2%	12%	12%	12%	11%	11%	11%	4%	4%	4%
Turn Type	Split	NA		Split	NA	Perm	Split	NA	custom	Split	NA	Perm
Protected Phases	4	4		7	7		6	6	2 6 7!	2!	2	
Permitted Phases						7						2
Actuated Green, G (s)	26.0	26.0		13.1	13.1	13.1	12.1	12.1	70.1	35.1	35.1	35.1
Effective Green, g (s)	26.0	26.0		13.1	13.1	13.1	12.1	12.1	70.1	35.1	35.1	35.1
Actuated g/C Ratio	0.25	0.25		0.12	0.12	0.12	0.12	0.12	0.67	0.33	0.33	0.33
Clearance Time (s)	4.0	4.0		4.9	4.9	4.9	4.9	4.9		4.9	4.9	4.9
Vehicle Extension (s)	2.0	2.0		3.0	3.0	3.0	2.5	2.5		2.0	2.0	2.0
Lane Grp Cap (vph)	394	387		351	190	161	168	337	873	1012	1044	428
v/s Ratio Prot	0.12	c0.26		c0.16	0.13		0.02	c0.15	0.36	c0.49	0.18	
v/s Ratio Perm						0.01						0.03
v/c Ratio	0.48	1.05		1.28	1.06	0.12	0.21	1.30	0.54	1.48	0.54	0.10
Uniform Delay, d1	33.7	39.5		46.0	46.0	40.8	42.1	46.5	9.1	35.0	28.4	24.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	59.5		145.9	81.4	0.3	0.5	155.0	0.5	221.5	2.0	0.5
Delay (s)	34.0	99.0		191.8	127.4	41.2	42.6	201.5	9.6	256.4	30.4	24.5
Level of Service	C	F		F	F	D	D	F	A	F	C	C
Approach Delay (s)		78.9			146.6			99.6			185.0	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	146.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.29		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	18.7
Intersection Capacity Utilization	117.4%	ICU Level of Service	H
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	108	2141	930	43	54	38
Future Volume (vph)	108	2141	930	43	54	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9	4.9		4.2	4.2
Lane Util. Factor	1.00	0.91	0.91		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1736	4988	4560		1703	1524
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1736	4988	4560		1703	1524
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	109	2163	939	43	55	38
RTOR Reduction (vph)	0	0	2	0	0	34
Lane Group Flow (vph)	109	2163	980	0	55	4
Heavy Vehicles (%)	4%	4%	13%	13%	6%	6%
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	5	2	6		3	
Permitted Phases						3
Actuated Green, G (s)	10.1	81.3	67.2		9.6	9.6
Effective Green, g (s)	10.1	81.3	67.2		9.6	9.6
Actuated g/C Ratio	0.10	0.81	0.67		0.10	0.10
Clearance Time (s)	4.0	4.9	4.9		4.2	4.2
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	175	4055	3064		163	146
v/s Ratio Prot	c0.06	c0.43	0.21		c0.03	
v/s Ratio Perm						0.00
v/c Ratio	0.62	0.53	0.32		0.34	0.02
Uniform Delay, d1	43.1	3.1	6.9		42.2	41.0
Progression Factor	1.00	1.00	1.05		1.00	1.00
Incremental Delay, d2	4.9	0.5	0.3		0.4	0.0
Delay (s)	48.0	3.6	7.4		42.7	41.0
Level of Service	D	A	A		D	D
Approach Delay (s)		5.7	7.4		42.0	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.1
Intersection Capacity Utilization	59.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBU	EBL	EBT	EBR	WBL2	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	1	320	2016	839	48	887	21	532	92	127	10	16
Future Volume (vph)	1	320	2016	839	48	887	21	532	92	127	10	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.6		4.0	4.6		4.0	4.0	4.0		4.0
Lane Util. Factor		1.00	0.91		1.00	0.91		0.91	0.91	1.00		0.95
Frpb, ped/bikes		1.00	0.99		1.00	1.00		1.00	1.00	0.93		0.98
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00
Frt		1.00	0.96		1.00	1.00		1.00	1.00	0.85		0.91
Flt Protected		0.95	1.00		0.95	1.00		0.95	0.97	1.00		0.99
Satd. Flow (prot)		1752	4788		1480	4233		3042	1557	1390		2749
Flt Permitted		0.95	1.00		0.95	1.00		0.95	0.97	1.00		0.99
Satd. Flow (perm)		1752	4788		1480	4233		3042	1557	1390		2749
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	1	323	2036	847	48	896	21	537	93	128	10	16
RTOR Reduction (vph)	0	0	0	0	0	1	0	0	0	101	0	60
Lane Group Flow (vph)	0	324	2883	0	48	916	0	419	211	27	0	2
Confl. Peds. (#/hr)							9			51		
Confl. Bikes (#/hr)				9			1			4		
Heavy Vehicles (%)	2%	3%	3%	3%	22%	22%	22%	8%	8%	8%	17%	17%
Turn Type	Prot	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA
Protected Phases	1	1	6		5	2		4	4		7	7
Permitted Phases										4		
Actuated Green, G (s)		14.3	40.9		7.4	34.0		26.9	26.9	26.9		3.5
Effective Green, g (s)		14.3	40.9		7.4	34.0		26.9	26.9	26.9		3.5
Actuated g/C Ratio		0.11	0.32		0.06	0.27		0.21	0.21	0.21		0.03
Clearance Time (s)		4.0	4.6		4.0	4.6		4.0	4.0	4.0		4.0
Vehicle Extension (s)		2.0	3.0		2.0	3.0		2.0	2.0	2.0		2.0
Lane Grp Cap (vph)		196	1539		86	1131		643	329	293		75
v/s Ratio Prot		c0.18	c0.60		0.03	0.22		c0.14	0.14			c0.00
v/s Ratio Perm										0.02		
v/c Ratio		1.65	1.87		0.56	0.81		0.65	0.64	0.09		0.02
Uniform Delay, d1		56.5	43.2		58.3	43.6		45.9	45.7	40.3		60.2
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00
Incremental Delay, d2		315.5	395.5		4.4	4.4		1.8	3.2	0.1		0.0
Delay (s)		372.0	438.6		62.7	47.9		47.7	48.9	40.4		60.2
Level of Service		F	F		E	D		D	D	D		E
Approach Delay (s)			431.9			48.7			46.8			60.2
Approach LOS			F			D			D			E

Intersection Summary			
HCM 2000 Control Delay	394.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.61		
Actuated Cycle Length (s)	127.2	Sum of lost time (s)	21.1
Intersection Capacity Utilization	163.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR2	NER	NER2
Lane Configurations			
Traffic Volume (vph)	36	1813	701
Future Volume (vph)	36	1813	701
Ideal Flow (vphpl)	1900	1990	1900
Total Lost time (s)		4.5	4.5
Lane Util. Factor		*0.95	1.00
Frpb, ped/bikes		1.00	1.00
Flpb, ped/bikes		1.00	1.00
Frt		1.00	0.85
Flt Protected		1.00	1.00
Satd. Flow (prot)		3781	1615
Flt Permitted		1.00	1.00
Satd. Flow (perm)		3781	1615
Peak-hour factor, PHF	0.99	0.99	0.99
Adj. Flow (vph)	36	1831	708
RTOR Reduction (vph)	0	0	0
Lane Group Flow (vph)	0	1831	708
Confl. Peds. (#/hr)			63
Confl. Bikes (#/hr)	2		
Heavy Vehicles (%)	17%	0%	0%
Turn Type		Prot	Prot
Protected Phases		3	3
Permitted Phases			
Actuated Green, G (s)		27.4	27.4
Effective Green, g (s)		27.4	27.4
Actuated g/C Ratio		0.22	0.22
Clearance Time (s)		4.5	4.5
Vehicle Extension (s)		2.0	2.0
Lane Grp Cap (vph)		814	347
v/s Ratio Prot		c0.48	0.44
v/s Ratio Perm			
v/c Ratio		2.25	2.04
Uniform Delay, d1		49.9	49.9
Progression Factor		1.00	1.00
Incremental Delay, d2		566.2	478.1
Delay (s)		616.1	528.0
Level of Service		F	F
Approach Delay (s)			
Approach LOS			

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	187	750	3	1	188	36	2	2	1	59	2	120
Future Volume (vph)	187	750	3	1	188	36	2	2	1	59	2	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			0.95	0.95
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.98			0.97			0.95	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.97	1.00
Satd. Flow (prot)	1752	3502		1378	2676			1812			1394	1289
Flt Permitted	0.95	1.00		0.95	1.00			1.00			0.81	1.00
Satd. Flow (perm)	1752	3502		1378	2676			1849			1158	1289
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	189	758	3	1	190	36	2	2	1	60	2	121
RTOR Reduction (vph)	0	0	0	0	0	0	0	1	0	0	16	76
Lane Group Flow (vph)	189	761	0	1	226	0	0	4	0	0	79	12
Confl. Peds. (#/hr)						11						
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	3%	3%	3%	31%	31%	31%	0%	0%	0%	19%	19%	19%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			3			4	
Permitted Phases							3			4		4
Actuated Green, G (s)	10.8	28.1		0.5	17.8			0.6			6.9	6.9
Effective Green, g (s)	10.8	28.1		0.5	17.8			0.6			6.9	6.9
Actuated g/C Ratio	0.21	0.54		0.01	0.34			0.01			0.13	0.13
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Vehicle Extension (s)	2.0	2.5		2.0	2.5			2.0			2.0	2.0
Lane Grp Cap (vph)	363	1888		13	914			21			153	170
v/s Ratio Prot	c0.11	c0.22		0.00	0.08							
v/s Ratio Perm								c0.00			c0.07	0.01
v/c Ratio	0.52	0.40		0.08	0.25			0.19			0.52	0.07
Uniform Delay, d1	18.3	7.1		25.6	12.3			25.5			21.1	19.8
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.6	0.1		0.9	0.1			1.6			1.2	0.1
Delay (s)	19.0	7.2		26.5	12.4			27.1			22.3	19.8
Level of Service	B	A		C	B			C			C	B
Approach Delay (s)		9.5			12.5			27.1			21.1	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	52.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Intersection Delay, s/veh	261.1
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	257	43	104	928	13	319	0	112	4	12	39
Future Vol, veh/h	8	257	43	104	928	13	319	0	112	4	12	39
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	22	22	22	10	10	10	7	7	7	100	100	100
Mvmt Flow	8	271	45	109	977	14	336	0	118	4	13	41
Number of Lanes	0	1	1	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	23.8	438.6	31.2	17.7
HCM LOS	C	F	D	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	100%	0%	3%	0%	100%	0%	7%
Vol Thru, %	0%	0%	97%	0%	0%	99%	22%
Vol Right, %	0%	100%	0%	100%	0%	1%	71%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	319	112	265	43	104	941	55
LT Vol	319	0	8	0	104	0	4
Through Vol	0	0	257	0	0	928	12
RT Vol	0	112	0	43	0	13	39
Lane Flow Rate	336	118	279	45	109	991	58
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.76	0.228	0.617	0.091	0.24	2.025	0.162
Departure Headway (Hd)	9.701	8.452	9.231	8.482	7.882	7.359	12.321
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	376	428	393	425	454	495	293
Service Time	7.401	6.152	6.931	6.182	5.646	5.123	10.321
HCM Lane V/C Ratio	0.894	0.276	0.71	0.106	0.24	2.002	0.198
HCM Control Delay	37.4	13.6	25.7	12	13.1	485.6	17.7
HCM Lane LOS	E	B	D	B	B	F	C
HCM 95th-tile Q	6.1	0.9	4	0.3	0.9	67.6	0.6

HCM 6th Signalized Intersection Summary
1: Gateway & Corporate

02/26/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	265	4	61	8	4	27	27	1169	5	20	476	29
Future Volume (veh/h)	265	4	61	8	4	27	27	1169	5	20	476	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	22	0	0	0	0
Ped-Bike Adj(A_pbT)	0.97		0.97	0.97		0.96	1.00		0.97	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1648	1648	1648	1796	1796	1796	1811	1811	1811
Adj Flow Rate, veh/h	268	4	14	8	4	6	27	1181	5	20	481	25
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	1	1	17	17	17	7	7	7	6	6	6
Cap, veh/h	438	91	319	389	147	220	79	1840	7	63	1721	89
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.05	0.53	0.53	0.04	0.52	0.52
Sat Flow, veh/h	1380	360	1259	1198	580	870	1711	3485	15	1725	3321	172
Grp Volume(v), veh/h	268	0	18	8	0	10	27	578	608	20	249	257
Grp Sat Flow(s),veh/h/ln	1380	0	1619	1198	0	1450	1711	1706	1793	1725	1721	1773
Q Serve(g_s), s	13.6	0.0	0.6	0.4	0.0	0.4	1.1	18.2	18.2	0.8	6.1	6.1
Cycle Q Clear(g_c), s	14.0	0.0	0.6	1.0	0.0	0.4	1.1	18.2	18.2	0.8	6.1	6.1
Prop In Lane	1.00		0.78	1.00		0.60	1.00		0.01	1.00		0.10
Lane Grp Cap(c), veh/h	438	0	410	389	0	367	79	901	947	63	892	919
V/C Ratio(X)	0.61	0.00	0.04	0.02	0.00	0.03	0.34	0.64	0.64	0.32	0.28	0.28
Avail Cap(c_a), veh/h	657	0	667	580	0	597	237	901	947	239	892	919
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98
Uniform Delay (d), s/veh	26.3	0.0	21.2	21.5	0.0	21.1	34.7	13.3	13.3	35.2	10.2	10.2
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.0	0.0	0.0	1.0	3.5	3.3	1.1	0.8	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	2.7	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	0.0	0.2	0.1	0.0	0.1	0.5	8.7	9.0	0.4	2.3	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.8	0.0	21.2	21.5	0.0	21.1	35.6	19.8	19.4	36.3	10.9	10.9
LnGrp LOS	C	A	C	C	A	C	D	B	B	D	B	B
Approach Vol, veh/h		286			18			1213			526	
Approach Delay, s/veh		26.5			21.3			19.9			11.9	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.7	44.7		23.6	7.4	44.0		23.6				
Change Period (Y+Rc), s	4.0	5.1		4.6	4.0	5.1		4.6				
Max Green Setting (Gmax), s	10.4	20.0		30.9	10.4	20.0		30.9				
Max Q Clear Time (g_c+I1), s	2.8	20.2		16.0	3.1	8.1		3.0				
Green Ext Time (p_c), s	0.0	0.0		0.4	0.0	1.6		0.0				

Intersection Summary			
HCM 6th Ctrl Delay			18.8
HCM 6th LOS			B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	838	141	12	3352	422	326
Future Volume (veh/h)	838	141	12	3352	422	326
Initial Q (Qb), veh	0	0	0	0	5	0
Ped-Bike Adj(A_pbT)		0.96	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1781	1781	1856	1856	1781	1781
Adj Flow Rate, veh/h	846	125	12	3386	426	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	8	8	3	3	8	8
Cap, veh/h	2186	321	30	2583	489	
Arrive On Green	1.00	1.00	0.02	0.64	0.28	0.00
Sat Flow, veh/h	4415	624	1767	5233	1697	2657
Grp Volume(v), veh/h	643	328	12	3386	426	0
Grp Sat Flow(s),veh/h/ln	1621	1637	1767	1689	1697	1329
Q Serve(g_s), s	0.0	0.0	0.7	64.2	24.2	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.7	64.2	24.2	0.0
Prop In Lane		0.38	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1666	840	30	2583	489	
V/C Ratio(X)	0.39	0.39	0.40	1.31	0.87	
Avail Cap(c_a), veh/h	1896	957	141	3251	696	
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.98	0.98	0.09	0.09	1.00	0.00
Uniform Delay (d), s/veh	1.5	1.5	48.6	24.5	34.4	0.0
Incr Delay (d2), s/veh	0.7	1.3	0.3	140.1	8.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	5.9	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.7	0.3	52.3	12.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	2.1	2.8	48.9	164.6	48.8	0.0
LnGrp LOS	A	A	D	F	D	
Approach Vol, veh/h	971			3398	426	A
Approach Delay, s/veh	2.4			164.1	48.8	
Approach LOS	A			F	D	

Timer - Assigned Phs	1	2	6	8
Phs Duration (G+Y+Rc), s	5.7	62.5	68.2	31.8
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	8.0	39.0	51.0	41.0
Max Q Clear Time (g_c+I1), s	2.7	2.0	66.2	26.2
Green Ext Time (p_c), s	0.0	4.7	0.0	1.6

Intersection Summary	
HCM 6th Ctrl Delay	121.1
HCM 6th LOS	F

Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	165	808	191	762	1992	490	577	160	416	124	376	795
Future Volume (veh/h)	165	808	191	762	1992	490	577	160	416	124	376	795
Initial Q (Qb), veh	0	0	0	0	34	0	0	0	0	0	32	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.94	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1722	1722	1722	1870	1870	1870	1767	1767	1767	1856	1856	1856
Adj Flow Rate, veh/h	167	816	41	770	2012	467	583	162	0	125	380	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	12	12	12	2	2	2	9	9	9	3	3	3
Cap, veh/h	704	2990	920	438	1563	130	314	650		164	588	
Arrive On Green	0.22	0.43	0.43	0.17	0.44	0.44	0.19	0.23	0.00	0.09	0.14	0.00
Sat Flow, veh/h	1640	4701	1440	3456	4130	911	1682	1767	1497	1767	3526	1572
Grp Volume(v), veh/h	167	816	41	770	1639	840	583	162	0	125	380	0
Grp Sat Flow(s),veh/h/ln	1640	1567	1440	1728	1702	1637	1682	1767	1497	1767	1763	1572
Q Serve(g_s), s	13.2	18.0	1.4	19.0	49.1	49.1	28.0	11.6	0.0	10.4	15.7	0.0
Cycle Q Clear(g_c), s	13.2	18.0	1.4	19.0	49.1	49.1	28.0	11.6	0.0	10.4	15.7	0.0
Prop In Lane	1.00		1.00	1.00		0.56	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	704	2990	920	438	1114	579	314	650		164	588	
V/C Ratio(X)	0.24	0.27	0.04	1.76	1.47	1.45	1.86	0.25		0.76	0.65	
Avail Cap(c_a), veh/h	363	2013	616	438	1114	536	314	625		224	1044	
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.94	0.94	0.94	0.09	0.09	0.09	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	27.9	12.8	16.2	62.4	42.3	42.3	61.0	33.3	0.0	66.4	60.8	0.0
Incr Delay (d2), s/veh	0.1	0.2	0.1	342.5	212.6	203.5	397.4	0.1	0.0	6.2	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	73.2	70.5	0.0	0.0	0.0	0.0	60.3	0.0
%ile BackOfQ(50%),veh/ln	3.9	4.1	0.5	28.9	63.6	64.2	46.6	4.2	0.0	5.0	14.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.9	13.0	16.3	404.8	328.1	316.3	458.4	33.3	0.0	72.7	121.6	0.0
LnGrp LOS	C	B	B	F	F	F	F	C		E	F	
Approach Vol, veh/h		1024			3249			745	A		505	A
Approach Delay, s/veh		15.6			343.3			366.0			109.4	
Approach LOS		B			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	23.0	69.1	32.9	25.0	38.1	54.0	17.9	40.0
Change Period (Y+Rc), s	4.0	4.9	4.9	* 4.6	4.9	* 4.9	4.0	4.9
Max Green Setting (Gmax), s	19.0	41.1	28.0	* 44	11.0	* 49	19.0	53.1
Max Q Clear Time (g_c+I1), s	21.0	20.0	30.0	17.7	15.2	51.1	12.4	13.6
Green Ext Time (p_c), s	0.0	3.9	0.0	1.5	0.0	0.0	0.1	0.5

Intersection Summary	
HCM 6th Ctrl Delay	264.2
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	368	801	179	308	2346	14	302	60	35	43	448	596
Future Volume (veh/h)	368	801	179	308	2346	14	302	60	35	43	448	596
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.92	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1663	1663	1663	1856	1856	1856	1767	1767	1767	1826	1826	1826
Adj Flow Rate, veh/h	372	809	181	311	2370	13	305	61	5	43	453	338
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	16	16	16	3	3	3	9	9	9	5	5	5
Cap, veh/h	434	1436	436	362	1458	8	324	646	282	464	488	708
Arrive On Green	0.28	0.63	0.63	0.11	0.28	0.28	0.19	0.19	0.19	0.27	0.27	0.27
Sat Flow, veh/h	3072	4540	1378	3428	5196	28	1682	3357	1467	1739	1826	2652
Grp Volume(v), veh/h	372	809	181	311	1539	844	305	61	5	43	453	338
Grp Sat Flow(s),veh/h/ln	1536	1513	1378	1714	1689	1847	1682	1678	1467	1739	1826	1326
Q Serve(g_s), s	17.2	15.3	9.8	13.4	42.1	42.1	26.8	2.2	0.4	2.8	36.3	16.1
Cycle Q Clear(g_c), s	17.2	15.3	9.8	13.4	42.1	42.1	26.8	2.2	0.4	2.8	36.3	16.1
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	434	1436	436	362	948	519	324	646	282	464	488	708
V/C Ratio(X)	0.86	0.56	0.42	0.86	1.62	1.63	0.94	0.09	0.02	0.09	0.93	0.48
Avail Cap(c_a), veh/h	434	1436	436	494	948	519	326	651	285	498	523	760
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.83	0.83	0.83	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.4	21.7	20.7	66.0	53.9	54.0	59.7	49.8	49.1	41.3	53.6	46.2
Incr Delay (d2), s/veh	13.3	1.3	2.4	8.5	285.7	290.9	34.4	0.0	0.0	0.0	21.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.6	4.2	2.9	6.3	55.5	61.4	14.5	1.0	0.2	1.2	19.6	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.6	23.0	23.1	74.4	339.7	344.8	94.1	49.8	49.1	41.3	75.3	46.4
LnGrp LOS	E	C	C	E	F	F	F	D	D	D	E	D
Approach Vol, veh/h		1362			2694			371			834	
Approach Delay, s/veh		34.7			310.7			86.2			61.8	
Approach LOS		C			F			F			E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	25.2	47.0		44.1	20.8	51.4		33.8				
Change Period (Y+Rc), s	4.0	4.9		4.0	4.9	4.0		4.9				
Max Green Setting (Gmax), s	18.0	42.1		43.0	21.6	38.5		29.1				
Max Q Clear Time (g_c+I1), s	19.2	44.1		38.3	15.4	17.3		28.8				
Green Ext Time (p_c), s	0.0	0.0		1.5	0.5	6.2		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			183.9									
HCM 6th LOS			F									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	148	485	130	1119	14	486	714	175	10	260	1247
Future Volume (veh/h)	110	148	485	130	1119	14	486	714	175	10	260	1247
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		1.00	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1781	1781	1811	1811	1811	1767	1767	1767	1841	1841	1841
Adj Flow Rate, veh/h	111	149	106	131	1130	3	491	721	0	10	263	970
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	8	8	8	6	6	6	9	9	9	4	4	4
Cap, veh/h	301	421	611	161	1177	355	752	773		469	493	705
Arrive On Green	0.09	0.24	0.24	0.09	0.24	0.24	0.23	0.23	0.00	0.27	0.27	0.27
Sat Flow, veh/h	3291	1781	2584	1725	4944	1492	3264	3445	0	1753	1841	2633
Grp Volume(v), veh/h	111	149	106	131	1130	3	491	721	0	10	263	970
Grp Sat Flow(s),veh/h/ln	1646	1781	1292	1725	1648	1492	1632	1678	0	1753	1841	1316
Q Serve(g_s), s	3.3	7.3	3.4	7.8	23.7	0.2	14.3	22.1	0.0	0.4	12.8	28.1
Cycle Q Clear(g_c), s	3.3	7.3	3.4	7.8	23.7	0.2	14.3	22.1	0.0	0.4	12.8	28.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	301	421	611	161	1177	355	752	773		469	493	705
V/C Ratio(X)	0.37	0.35	0.17	0.82	0.96	0.01	0.65	0.93		0.02	0.53	1.38
Avail Cap(c_a), veh/h	313	424	615	164	1177	355	752	773		469	493	705
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.73	0.73	0.73	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.8	33.4	31.9	46.7	39.5	30.5	36.6	39.6	0.0	28.3	32.9	38.5
Incr Delay (d2), s/veh	0.2	0.3	0.1	24.1	17.3	0.0	4.4	19.5	0.0	0.0	0.6	178.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	3.2	1.1	4.4	11.3	0.1	6.0	11.0	0.0	0.2	5.7	26.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.0	33.7	32.0	70.8	56.8	30.5	41.0	59.1	0.0	28.3	33.4	216.8
LnGrp LOS	D	C	C	E	E	C	D	E		C	C	F
Approach Vol, veh/h		366			1264			1212	A		1243	
Approach Delay, s/veh		36.6			58.2			51.8			176.5	
Approach LOS		D			E			D			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.8	29.4		28.8	13.6	29.6		33.0
Change Period (Y+Rc), s	4.0	4.6		4.6	4.0	4.6		4.9
Max Green Setting (Gmax), s	10.0	25.0		23.8	10.0	25.0		28.1
Max Q Clear Time (g_c+I1), s	9.8	9.3		24.1	5.3	25.7		30.1
Green Ext Time (p_c), s	0.0	0.9		0.0	0.1	0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	90.4
HCM 6th LOS	F

Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
10: Produce Ave./Airport Blvd. & San Mateo Ave./So. Airport Blvd.

02/26/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	169	262	208	2017	311	416	112	29	362	158	1139	183
Future Volume (veh/h)	169	262	208	2017	311	416	112	29	362	158	1139	183
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1811	1811	1678	1678	1678	1856	1856	1856
Adj Flow Rate, veh/h	145	301	0	2037	314	0	113	29	0	160	1151	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	6	6	6	6	6	6	15	15	15	3	3	3
Cap, veh/h	199	417		1475	549		143	757		328	1203	
Arrive On Green	0.12	0.12	0.00	0.30	0.30	0.00	0.09	0.24	0.00	0.19	0.34	0.00
Sat Flow, veh/h	1725	3622	1535	4864	1811	1535	1598	3188	1422	1767	3526	1572
Grp Volume(v), veh/h	145	301	0	2037	314	0	113	29	0	160	1151	0
Grp Sat Flow(s),veh/h/ln	1725	1811	1535	1621	1811	1535	1598	1594	1422	1767	1763	1572
Q Serve(g_s), s	9.7	9.6	0.0	36.4	17.5	0.0	8.3	0.8	0.0	9.7	38.3	0.0
Cycle Q Clear(g_c), s	9.7	9.6	0.0	36.4	17.5	0.0	8.3	0.8	0.0	9.7	38.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	199	417		1475	549		143	757		328	1203	
V/C Ratio(X)	0.73	0.72		1.38	0.57		0.79	0.04		0.49	0.96	
Avail Cap(c_a), veh/h	316	664		1475	549		146	757		328	1203	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.09	0.09	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	51.3	51.2	0.0	41.8	35.2	0.0	53.5	35.2	0.0	43.7	38.7	0.0
Incr Delay (d2), s/veh	1.9	0.9	0.0	171.7	0.1	0.0	22.2	0.1	0.0	0.4	17.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	4.4	0.0	38.0	7.8	0.0	4.2	0.3	0.0	4.3	19.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.2	52.1	0.0	213.5	35.4	0.0	75.7	35.3	0.0	44.2	56.2	0.0
LnGrp LOS	D	D		F	D		E	D		D	E	
Approach Vol, veh/h		446	A		2351	A		142	A		1311	A
Approach Delay, s/veh		52.5			189.7			67.5			54.7	
Approach LOS		D			F			E			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.7	45.8		18.4	27.2	33.4		41.0				
Change Period (Y+Rc), s	4.0	4.9		4.6	4.9	* 4.9		4.6				
Max Green Setting (Gmax), s	11.0	32.5		22.0	15.0	* 29		36.4				
Max Q Clear Time (g_c+I1), s	10.3	40.3		11.7	11.7	2.8		38.4				
Green Ext Time (p_c), s	0.0	0.0		1.2	0.1	0.1		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			129.6									
HCM 6th LOS			F									

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	274	0	76	4	0	45	10	1455	3	104	501	44
Future Volume (veh/h)	274	0	76	4	0	45	10	1455	3	104	501	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	44	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1841	1841	1841	1796	1796	1796
Adj Flow Rate, veh/h	277	0	14	4	0	6	10	1470	3	105	506	38
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	0	0	0	0	0	0	4	4	4	7	7	7
Cap, veh/h	297	0	438	58	23	35	17	1807	3	133	1840	138
Arrive On Green	0.27	0.00	0.27	0.27	0.00	0.27	0.01	0.50	0.50	0.08	0.57	0.57
Sat Flow, veh/h	783	0	1596	0	85	128	1753	3581	7	1711	3214	241
Grp Volume(v), veh/h	277	0	14	10	0	0	10	718	755	105	268	276
Grp Sat Flow(s),veh/h/ln	783	0	1596	213	0	0	1753	1749	1839	1711	1706	1749
Q Serve(g_s), s	0.0	0.0	0.6	0.0	0.0	0.0	0.5	30.2	30.2	5.3	7.0	7.0
Cycle Q Clear(g_c), s	24.0	0.0	0.6	24.0	0.0	0.0	0.5	30.2	30.2	5.3	7.0	7.0
Prop In Lane	1.00		1.00	0.40		0.60	1.00		0.00	1.00		0.14
Lane Grp Cap(c), veh/h	297	0	438	116	0	0	17	882	928	133	977	1001
V/C Ratio(X)	0.93	0.00	0.03	0.09	0.00	0.00	0.58	0.81	0.81	0.79	0.27	0.28
Avail Cap(c_a), veh/h	297	0	438	116	0	0	482	882	928	470	977	1001
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.4	0.0	23.2	25.6	0.0	0.0	43.1	20.1	20.0	39.6	9.5	9.5
Incr Delay (d2), s/veh	34.1	0.0	0.0	0.1	0.0	0.0	10.8	8.1	7.8	3.9	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.1	21.7	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.7	0.0	0.2	0.2	0.0	0.0	0.3	21.8	22.1	2.3	2.6	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.5	0.0	23.2	25.8	0.0	0.0	53.9	52.3	49.5	43.5	10.2	10.2
LnGrp LOS	E	A	C	C	A	A	D	D	D	D	B	B
Approach Vol, veh/h		291			10			1483			649	
Approach Delay, s/veh		66.3			25.8			50.9			15.6	
Approach LOS		E			C			D			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.8	48.6		28.0	4.9	54.5		28.0
Change Period (Y+Rc), s	4.0	4.5		4.0	4.0	4.5		4.0
Max Green Setting (Gmax), s	24.0	30.0		24.0	24.0	50.0		24.0
Max Q Clear Time (g_c+I1), s	7.3	32.2		26.0	2.5	9.0		26.0
Green Ext Time (p_c), s	0.1	0.0		0.0	0.0	2.3		0.0

Intersection Summary	
HCM 6th Ctrl Delay	43.2
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	253	842	295	1813	1147	2368	541	167	230	0	0	0
Future Volume (veh/h)	253	842	295	1813	1147	2368	541	167	230	0	0	0
Initial Q (Qb), veh	0	0	0	32	16	0	10	0	5			
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1841	1841	1841	1870	1870	1870	1826	1826	1826			
Adj Flow Rate, veh/h	256	851	114	1831	1483	1807	546	169	232			
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99			
Percent Heavy Veh, %	4	4	4	2	2	2	5	5	5			
Cap, veh/h	247	976	398	1388	2258	1881	683	390	1650			
Arrive On Green	0.07	0.27	0.27	0.41	0.61	0.61	0.20	0.20	0.20			
Sat Flow, veh/h	3506	3681	1503	3563	3741	3170	3374	1826	2723			
Grp Volume(v), veh/h	256	851	114	1831	1483	1807	546	169	232			
Grp Sat Flow(s),veh/h/ln	1753	1841	1503	1781	1870	1585	1687	1826	1362			
Q Serve(g_s), s	7.4	22.2	6.1	41.5	26.2	52.9	15.7	8.3	3.7			
Cycle Q Clear(g_c), s	7.4	22.2	6.1	41.5	26.2	52.9	15.7	8.3	3.7			
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	247	976	398	1388	2258	1881	683	390	1650			
V/C Ratio(X)	1.04	0.87	0.29	1.32	0.66	0.96	0.80	0.43	0.14			
Avail Cap(c_a), veh/h	259	999	408	1459	2270	1924	832	450	1787			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	49.5	36.4	30.3	32.5	13.9	20.0	39.3	35.3	8.8			
Incr Delay (d2), s/veh	66.5	8.7	0.6	148.7	0.8	12.6	3.7	0.3	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	83.0	1.1	0.0	7.7	0.0	0.1			
%ile BackOfQ(50%),veh/ln	5.6	11.4	2.3	62.2	12.3	22.3	8.2	3.7	0.5			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	116.0	45.1	30.9	264.2	15.7	32.6	50.7	35.6	8.9			
LnGrp LOS	F	D	C	F	B	C	D	D	A			
Approach Vol, veh/h		1221			5121			947				
Approach Delay, s/veh		58.6			110.5			37.8				
Approach LOS		E			F			D				
Timer - Assigned Phs	1	2		4	5	6						
Phs Duration (G+Y+Rc), s	45.0	32.5		23.9	11.0	66.5						
Change Period (Y+Rc), s	3.5	5.0		4.0	3.5	5.0						
Max Green Setting (Gmax), s	41.5	27.5		25.0	7.5	61.5						
Max Q Clear Time (g_c+I1), s	43.5	24.2		17.7	9.4	54.9						
Green Ext Time (p_c), s	0.0	2.4		2.2	0.0	6.6						
Intersection Summary												
HCM 6th Ctrl Delay			92.4									
HCM 6th LOS			F									

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary
22: Veterans Blvd & Oyster Point Blvd.

02/26/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	236	1023	30	7	2921	41	150	1	18	27	10	274
Future Volume (veh/h)	236	1023	30	7	2921	41	150	1	18	27	10	274
Initial Q (Qb), veh	0	32	0	0	140	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.99	1.00		0.96	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1678	1678	1678	1870	1870	1870	1841	1841	1841	1870	1870	1870
Adj Flow Rate, veh/h	238	1033	29	7	2951	40	152	1	1	27	10	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	15	15	15	2	2	2	4	4	4	2	2	2
Cap, veh/h	199	2257	59	15	3431	25	225	106	106	43	16	91
Arrive On Green	0.06	0.71	0.71	0.01	0.66	0.66	0.13	0.13	0.13	0.03	0.03	0.00
Sat Flow, veh/h	3100	3162	89	1781	5191	70	1753	824	824	1317	488	2790
Grp Volume(v), veh/h	238	521	541	7	1930	1061	152	0	2	37	0	0
Grp Sat Flow(s),veh/h/ln	1550	1594	1657	1781	1702	1857	1753	0	1647	1805	0	1395
Q Serve(g_s), s	9.0	19.6	19.6	0.5	63.0	64.1	11.6	0.0	0.1	2.8	0.0	0.0
Cycle Q Clear(g_c), s	9.0	19.6	19.6	0.5	63.0	64.1	11.6	0.0	0.1	2.8	0.0	0.0
Prop In Lane	1.00		0.05	1.00		0.04	1.00		0.50	0.73		1.00
Lane Grp Cap(c), veh/h	199	1135	1181	15	2234	1222	225	0	211	59	0	91
V/C Ratio(X)	1.19	0.46	0.46	0.46	0.86	0.87	0.68	0.00	0.01	0.63	0.00	0.00
Avail Cap(c_a), veh/h	199	1135	1180	64	2234	1218	338	0	318	77	0	120
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.43	0.43	0.43	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	65.5	9.8	9.8	69.1	24.1	24.1	58.2	0.0	53.3	66.9	0.0	0.0
Incr Delay (d2), s/veh	107.0	0.6	0.6	7.9	4.8	8.5	1.3	0.0	0.0	4.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	2.6	2.4	0.0	89.3	77.9	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	10.0	10.2	0.3	62.6	65.9	5.3	0.0	0.1	1.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	172.5	13.0	12.8	77.0	118.1	110.4	59.6	0.0	53.3	70.9	0.0	0.0
LnGrp LOS	F	B	B	E	F	F	E	A	D	E	A	A
Approach Vol, veh/h		1300			2998			154			37	
Approach Delay, s/veh		42.1			115.3			59.5			70.9	
Approach LOS		D			F			E			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.0	96.5		22.0	5.2	104.3		8.6				
Change Period (Y+Rc), s	4.0	4.6		4.0	4.0	4.6		4.0				
Max Green Setting (Gmax), s	9.0	81.4		27.0	5.0	85.4		6.0				
Max Q Clear Time (g_c+I1), s	11.0	66.1		13.6	2.5	21.6		4.8				
Green Ext Time (p_c), s	0.0	14.2		0.3	0.0	8.4		0.0				

Intersection Summary			
HCM 6th Ctrl Delay			91.8
HCM 6th LOS			F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	405	40	273	1065	350	68	285	369	616	636	521
Future Volume (veh/h)	118	405	40	273	1065	350	68	285	369	616	636	521
Initial Q (Qb), veh	0	0	0	0	10	0	0	0	32	0	36	18
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1885	1885	1885	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	119	409	29	276	1076	325	69	288	373	622	642	351
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	1	1	1	2	2	2	2	2	2
Cap, veh/h	149	1725	121	387	1268	112	114	435	862	582	1142	504
Arrive On Green	0.08	0.35	0.35	0.11	0.38	0.38	0.06	0.18	0.18	0.18	0.31	0.31
Sat Flow, veh/h	1781	4864	340	3483	2703	807	1781	1870	2790	3456	3554	1529
Grp Volume(v), veh/h	119	285	153	276	709	692	69	288	373	622	642	351
Grp Sat Flow(s),veh/h/ln	1781	1702	1800	1742	1791	1719	1781	1870	1395	1728	1777	1529
Q Serve(g_s), s	7.2	6.5	6.6	8.4	42.0	42.0	4.1	16.4	0.0	19.7	16.8	17.3
Cycle Q Clear(g_c), s	7.2	6.5	6.6	8.4	42.0	42.0	4.1	16.4	0.0	19.7	16.8	17.3
Prop In Lane	1.00		0.19	1.00		0.47	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	149	1207	638	387	684	697	114	435	862	582	1142	504
V/C Ratio(X)	0.80	0.24	0.24	0.71	1.04	0.99	0.61	0.66	0.43	1.07	0.56	0.70
Avail Cap(c_a), veh/h	162	1207	638	412	684	657	130	493	1046	619	1090	469
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.21	0.21	0.21	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.5	25.0	25.0	47.2	34.0	34.0	50.1	38.4	32.2	45.7	32.7	21.3
Incr Delay (d2), s/veh	19.8	0.5	0.9	0.9	26.2	14.2	3.4	7.7	1.6	57.3	2.0	7.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	26.3	23.0	0.0	0.0	17.5	0.0	16.4	30.3
%ile BackOfQ(50%),veh/ln	4.1	2.7	3.0	3.6	27.2	24.7	1.9	7.8	7.3	12.4	12.1	13.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.3	25.5	25.9	48.1	86.6	71.2	53.5	46.1	51.3	103.1	51.0	59.4
LnGrp LOS	E	C	C	D	F	E	D	D	D	F	D	E
Approach Vol, veh/h		557			1677			730			1615	
Approach Delay, s/veh		35.0			73.9			49.4			72.9	
Approach LOS		C			E			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	38.7	13.2	47.0	24.7	25.1	16.2	44.0
Change Period (Y+Rc), s	4.0	5.0	4.0	5.0	5.0	* 5	4.0	5.0
Max Green Setting (Gmax), s	8.0	32.0	10.0	42.0	11.0	* 29	13.0	39.0
Max Q Clear Time (g_c+I1), s	6.1	19.3	9.2	44.0	21.7	18.4	10.4	8.6
Green Ext Time (p_c), s	0.0	3.2	0.0	0.0	0.0	1.7	0.2	1.9

Intersection Summary	
HCM 6th Ctrl Delay	64.9
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	683	2	75	2	0	3	63	252	3	0	130	1978
Future Volume (veh/h)	683	2	75	2	0	3	63	252	3	0	130	1978
Initial Q (Qb), veh	0	0	0	0	0	0	12	12	0	0	0	24
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1900	1900	1900	1841	1841	1841	0	1856	1856
Adj Flow Rate, veh/h	690	2	25	2	0	0	64	255	3	0	131	1624
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	4	4	4	0	0	0	4	4	4	0	3	3
Cap, veh/h	815	28	350	4	0	0	112	1170	13	0	1023	2156
Arrive On Green	0.25	0.25	0.25	0.00	0.00	0.00	0.05	0.61	0.61	0.00	0.52	0.52
Sat Flow, veh/h	3401	117	1461	1809	0	0	1753	1814	21	0	1856	2768
Grp Volume(v), veh/h	690	0	27	2	0	0	64	0	258	0	131	1624
Grp Sat Flow(s),veh/h/ln	1700	0	1578	1810	0	0	1753	0	1836	0	1856	1384
Q Serve(g_s), s	13.3	0.0	0.9	0.1	0.0	0.0	2.5	0.0	4.4	0.0	2.5	22.5
Cycle Q Clear(g_c), s	13.3	0.0	0.9	0.1	0.0	0.0	2.5	0.0	4.4	0.0	2.5	22.5
Prop In Lane	1.00		0.93	1.00		0.00	1.00		0.01	0.00		1.00
Lane Grp Cap(c), veh/h	815	0	378	4	0	0	112	0	1132	0	1023	2156
V/C Ratio(X)	0.85	0.00	0.07	0.51	0.00	0.00	0.57	0.00	0.23	0.00	0.13	0.75
Avail Cap(c_a), veh/h	1416	0	657	104	0	0	176	0	1977	0	1732	3270
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	31.2	0.0	25.3	42.6	0.0	0.0	51.3	0.0	6.6	0.0	9.0	4.9
Incr Delay (d2), s/veh	1.0	0.0	0.0	76.4	0.0	0.0	4.5	0.0	0.1	0.0	0.1	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	192.8	0.0	1.0	0.0	0.0	3.6
%ile BackOfQ(50%),veh/ln	6.7	0.0	0.4	0.1	0.0	0.0	9.2	0.0	3.0	0.0	1.1	16.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.2	0.0	25.4	119.0	0.0	0.0	248.6	0.0	7.7	0.0	9.0	9.0
LnGrp LOS	C	A	C	F	A	A	F	A	A	A	A	A
Approach Vol, veh/h		717			2			322			1755	
Approach Delay, s/veh		31.9			119.0			55.6			9.0	
Approach LOS		C			F			E			A	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	6.2	40.0		3.2		46.2		20.3				
Change Period (Y+Rc), s	3.0	3.5		3.0		3.5		3.0				
Max Green Setting (Gmax), s	7.0	65.0		4.0		75.0		29.0				
Max Q Clear Time (g_c+I1), s	4.5	24.5		2.1		6.4		15.3				
Green Ext Time (p_c), s	0.0	11.9		0.0		0.8		2.0				
Intersection Summary												
HCM 6th Ctrl Delay			20.3									
HCM 6th LOS			C									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	193	85	1404	491	747	64	482	166	656	447	138
Future Volume (vph)	160	193	85	1404	491	747	64	482	166	656	447	138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
Lane Util. Factor	1.00	1.00		0.97	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.97		1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1608	1559		3060	1660	1388	1547	3094	1384	3001	3094	1333
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1608	1559		3060	1660	1388	1547	3094	1384	3001	3094	1333
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	162	195	86	1418	496	755	65	487	168	663	452	139
RTOR Reduction (vph)	0	14	0	0	0	388	0	0	0	0	0	110
Lane Group Flow (vph)	162	267	0	1418	496	367	65	487	168	663	452	29
Confl. Peds. (#/hr)			74									5
Confl. Bikes (#/hr)			2			6			4			
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	5%	5%	5%	5%	5%	5%
Turn Type	Split	NA		Split	NA	Perm	Split	NA	custom	Split	NA	Perm
Protected Phases	4	4		7	7		6	6	2 6 7!	2!	2	
Permitted Phases						7						2
Actuated Green, G (s)	23.7	23.7		37.1	37.1	37.1	15.1	15.1	87.4	25.4	25.4	25.4
Effective Green, g (s)	23.7	23.7		37.1	37.1	37.1	15.1	15.1	87.4	25.4	25.4	25.4
Actuated g/C Ratio	0.20	0.20		0.31	0.31	0.31	0.13	0.13	0.73	0.21	0.21	0.21
Clearance Time (s)	4.0	4.0		4.9	4.9	4.9	4.9	4.9		4.9	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	2.5	2.5		2.0	2.0	2.0
Lane Grp Cap (vph)	317	307		946	513	429	194	389	1008	635	654	282
v/s Ratio Prot	0.10	c0.17		c0.46	0.30		0.04	c0.16	0.12	c0.22	0.15	
v/s Ratio Perm						0.26						0.02
v/c Ratio	0.51	0.87		1.50	0.97	0.85	0.34	1.25	0.17	1.04	0.69	0.10
Uniform Delay, d1	43.0	46.7		41.5	40.8	38.9	47.9	52.5	5.0	47.3	43.7	38.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.4	22.6		230.1	31.1	15.2	0.7	133.0	0.1	47.7	5.9	0.7
Delay (s)	44.4	69.2		271.6	71.9	54.2	48.6	185.4	5.1	95.0	49.6	38.9
Level of Service	D	E		F	E	D	D	F	A	F	D	D
Approach Delay (s)		60.1			173.0			131.0			72.4	
Approach LOS		E			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	132.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.7
Intersection Capacity Utilization	117.1%	ICU Level of Service	H
Analysis Period (min)	15		
! Phase conflict between lane groups.			
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	66	949	3658	116	30	75
Future Volume (vph)	66	949	3658	116	30	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9	4.9		4.2	4.2
Lane Util. Factor	1.00	0.91	0.91		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1687	4848	2700		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1687	4848	5058		1770	1583
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	67	959	3695	117	30	76
RTOR Reduction (vph)	0	0	2	0	0	69
Lane Group Flow (vph)	67	959	3810	0	30	7
Confl. Peds. (#/hr)				1		
Confl. Bikes (#/hr)				6		
Heavy Vehicles (%)	7%	7%	2%	2%	2%	2%
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	5	2	6		3	
Permitted Phases						3
Actuated Green, G (s)	8.0	70.9	58.9		9.6	9.6
Effective Green, g (s)	8.0	70.9	58.9		9.6	9.6
Actuated g/C Ratio	0.08	0.71	0.59		0.10	0.10
Clearance Time (s)	4.0	4.9	4.9		4.2	4.2
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	134	3437	1590		169	151
v/s Ratio Prot	c0.04	0.20	c1.41		c0.02	
v/s Ratio Perm						0.00
v/c Ratio	0.50	0.28	2.40		0.18	0.05
Uniform Delay, d1	44.1	5.3	20.6		41.6	41.1
Progression Factor	1.00	1.00	1.48		1.00	1.00
Incremental Delay, d2	1.1	0.2	628.5		0.2	0.0
Delay (s)	45.2	5.5	658.8		41.8	41.1
Level of Service	D	A	F		D	D
Approach Delay (s)		8.1	658.8		41.3	
Approach LOS		A	F		D	

Intersection Summary			
HCM 2000 Control Delay	510.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.1
Intersection Capacity Utilization	90.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBU	EBL	EBT	EBR	WBL2	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	4	49	757	262	152	3174	19	2	1719	32	80	8
Future Volume (vph)	4	49	757	262	152	3174	19	2	1719	32	80	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.6		4.0	4.6			4.0	4.0	4.0	
Lane Util. Factor		1.00	0.91		1.00	0.91			0.91	0.91	1.00	
Frpb, ped/bikes		1.00	1.00		1.00	1.00			1.00	1.00	0.94	
Flpb, ped/bikes		1.00	1.00		1.00	1.00			1.00	1.00	1.00	
Frt		1.00	0.96		1.00	1.00			1.00	1.00	0.85	
Flt Protected		0.95	1.00		0.95	1.00			0.95	0.95	1.00	
Satd. Flow (prot)		1597	4398		1770	5079			3189	1603	1478	
Flt Permitted		0.95	1.00		0.95	1.00			0.95	0.95	1.00	
Satd. Flow (perm)		1597	4398		1770	5079			3189	1603	1478	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	4	49	765	265	154	3206	19	2	1736	32	81	8
RTOR Reduction (vph)	0	0	0	0	0	1	0	0	0	0	61	0
Lane Group Flow (vph)	0	53	1030	0	154	3224	0	0	1182	588	20	0
Confl. Peds. (#/hr)							8				37	
Confl. Bikes (#/hr)				2			5				4	
Heavy Vehicles (%)	13%	13%	13%	13%	2%	2%	2%	3%	3%	3%	3%	1%
Turn Type	Prot	Prot	NA		Prot	NA		Split	Split	NA	Perm	Split
Protected Phases	1	1	6		5	2		4	4	4		7
Permitted Phases											4	
Actuated Green, G (s)		7.8	35.6		13.5	41.3			33.9	33.9	33.9	
Effective Green, g (s)		7.8	35.6		13.5	41.3			33.9	33.9	33.9	
Actuated g/C Ratio		0.06	0.26		0.10	0.30			0.25	0.25	0.25	
Clearance Time (s)		4.0	4.6		4.0	4.6			4.0	4.0	4.0	
Vehicle Extension (s)		2.0	3.0		2.0	3.0			2.0	2.0	2.0	
Lane Grp Cap (vph)		91	1149		175	1540			793	398	367	
v/s Ratio Prot		0.03	0.23		c0.09	c0.63			c0.37	0.37		
v/s Ratio Perm											0.01	
v/c Ratio		0.58	0.90		0.88	2.09			1.49	1.48	0.05	
Uniform Delay, d1		62.6	48.5		60.6	47.4			51.1	51.1	39.0	
Progression Factor		1.00	1.00		1.00	1.00			1.00	1.00	1.00	
Incremental Delay, d2		6.0	9.3		35.6	494.4			227.4	228.0	0.0	
Delay (s)		68.6	57.8		96.2	541.8			278.6	279.2	39.0	
Level of Service		E	E		F	F			F	F	D	
Approach Delay (s)			58.4			521.5				268.3		
Approach LOS			E			F				F		

Intersection Summary			
HCM 2000 Control Delay	322.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.46		
Actuated Cycle Length (s)	136.2	Sum of lost time (s)	21.1
Intersection Capacity Utilization	141.6%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

Movement	SBT	SBR2	NER	NER2
Lane Configurations				
Traffic Volume (vph)	27	431	444	191
Future Volume (vph)	27	431	444	191
Ideal Flow (vphpl)	1900	1900	1990	1900
Total Lost time (s)	4.0		4.5	4.5
Lane Util. Factor	0.95		*0.95	1.00
Frpb, ped/bikes	0.96		1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00
Frt	0.86		1.00	0.85
Flt Protected	1.00		1.00	1.00
Satd. Flow (prot)	2963		3376	1442
Flt Permitted	1.00		1.00	1.00
Satd. Flow (perm)	2963		3376	1442
Peak-hour factor, PHF	0.99	0.99	0.99	0.99
Adj. Flow (vph)	27	435	448	193
RTOR Reduction (vph)	372	0	0	0
Lane Group Flow (vph)	98	0	448	193
Confl. Peds. (#/hr)				54
Confl. Bikes (#/hr)		8		
Heavy Vehicles (%)	1%	1%	12%	12%
Turn Type	NA		Prot	Prot
Protected Phases	7		3	3
Permitted Phases				
Actuated Green, G (s)	8.8		23.3	23.3
Effective Green, g (s)	8.8		23.3	23.3
Actuated g/C Ratio	0.06		0.17	0.17
Clearance Time (s)	4.0		4.5	4.5
Vehicle Extension (s)	2.0		2.0	2.0
Lane Grp Cap (vph)	191		577	246
v/s Ratio Prot	c0.03		0.13	c0.13
v/s Ratio Perm				
v/c Ratio	0.92dr		0.78	0.78
Uniform Delay, d1	61.6		54.0	54.0
Progression Factor	1.00		1.00	1.00
Incremental Delay, d2	1.0		5.9	14.0
Delay (s)	62.6		59.9	68.0
Level of Service	E		E	E
Approach Delay (s)	62.6			
Approach LOS	E			

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	188	3	1	956	61	3	1	1	27	1	421
Future Volume (vph)	113	188	3	1	956	61	3	1	1	27	1	421
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			0.95	0.95
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.99			0.97			0.87	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.99	1.00
Satd. Flow (prot)	1492	2976		1656	3277			1795			1484	1461
Flt Permitted	0.95	1.00		0.95	1.00			0.63			0.96	1.00
Satd. Flow (perm)	1492	2976		1656	3277			1158			1430	1461
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	114	190	3	1	966	62	3	1	1	27	1	425
RTOR Reduction (vph)	0	0	0	0	0	0	0	1	0	0	182	205
Lane Group Flow (vph)	114	193	0	1	1028	0	0	4	0	0	46	20
Confl. Peds. (#/hr)			1			2						
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	21%	21%	21%	9%	9%	9%	0%	0%	0%	5%	5%	5%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			3			4	
Permitted Phases							3			4		4
Actuated Green, G (s)	11.7	54.4		0.9	43.6			19.1			8.7	8.7
Effective Green, g (s)	11.7	54.4		0.9	43.6			19.1			8.7	8.7
Actuated g/C Ratio	0.12	0.55		0.01	0.44			0.19			0.09	0.09
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Vehicle Extension (s)	2.0	2.5		2.0	2.5			2.0			2.0	2.0
Lane Grp Cap (vph)	176	1633		15	1441			223			125	128
v/s Ratio Prot	c0.08	0.06		0.00	c0.31							
v/s Ratio Perm								c0.00			c0.03	0.01
v/c Ratio	0.65	0.12		0.07	0.71			0.02			0.36	0.15
Uniform Delay, d1	41.7	10.8		48.7	22.7			32.4			42.6	41.8
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	6.0	0.0		0.7	1.6			0.2			0.7	0.2
Delay (s)	47.7	10.8		49.4	24.2			32.6			43.3	42.0
Level of Service	D	B		D	C			C			D	D
Approach Delay (s)		24.5			24.3			32.6			42.6	
Approach LOS		C			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	29.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	99.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	59.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Appendix E: Count Sheets

Location: Driveway 1 West of Gateway Blvd
Date Range: 12/11/2019 - 12/17/2019
Site Code: 01

	Wednesday			Thursday			Friday			Saturday			Sunday			Monday			Tuesday					
	12/11/2019			12/12/2019			12/13/2019			12/14/2019			12/15/2019			12/16/2019			12/17/2019			Mid-Week Average		
Time	**EB**	**WB**	**Total**	**EB**	**WB**	**Total**	**EB**	**WB**	**Total**	**EB**	**WB**	**Total**	**EB**	**WB**	**Total**	**EB**	**WB**	**Total**	**EB**	**WB**	**Total**	**EB**	**WB**	**Total**
12:00 AM	1	0	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0	1
1:00 AM	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
2:00 AM	0	1	1	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	2
3:00 AM	2	0	2	2	1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	3
4:00 AM	0	3	3	0	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	3	3
5:00 AM	0	16	16	1	17	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	17	17
6:00 AM	5	43	48	3	47	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	45	49
7:00 AM	8	77	85	3	80	83	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	79	84
8:00 AM	6	**111**	**117**	8	**85**	**93**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	**98**	**105**
9:00 AM	10	51	61	10	55	65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	53	63
10:00 AM	10	21	31	**18**	25	43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**14**	23	37
11:00 AM	**24**	28	52	0	6	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	17	29
12:00 PM	23	20	43	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	10	22
1:00 PM	11	**22**	33	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	**11**	17
2:00 PM	20	14	34	14	2	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17	8	25
3:00 PM	10	10	20	14	10	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	10	22
4:00 PM	40	5	45	29	6	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35	6	40
5:00 PM	**41**	6	**47**	**43**	**11**	**54**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**42**	9	**51**
6:00 PM	16	5	21	17	4	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17	5	21
7:00 PM	9	2	11	6	3	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	3	10
8:00 PM	6	1	7	5	4	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	3	8
9:00 PM	3	2	5	3	2	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	2	5
10:00 PM	4	2	6	2	1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	2	5
11:00 PM	1	1	2	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	3
Total	250	441	691	180	364	544	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	215	403	618
Percent	36%	64%	-	33%	67%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35%	65%	-
AM Peak	11:00	08:00	08:00	10:00	08:00	08:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10:00	08:00	08:00
Vol.	24	111	117	18	85	93	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	98	105
PM Peak	17:00	13:00	17:00	17:00	17:00	17:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17:00	13:00	17:00
Vol.	41	22	47	43	11	54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	42	11	51

1. Mid-week average includes data between Tuesday and Thursday.

Project Manager: (415) 310-6469
project.manager.ca@idaxdata.com

Location: Driveway 2 West of Gateway Blvd
Date Range: 12/11/2019 - 12/17/2019
Site Code: 02

idax DATA SOLUTIONS

	Wednesday			Thursday			Friday			Saturday			Sunday			Monday			Tuesday					
	12/11/2019			12/12/2019			12/13/2019			12/14/2019			12/15/2019			12/16/2019			12/17/2019			Mid-Week Average		
Time	**EB**	**WB**	**Total**	**EB**	**WB**	**Total**	**EB**	**WB**	**Total**	**EB**	**WB**	**Total**	**EB**	**WB**	**Total**	**EB**	**WB**	**Total**	**EB**	**WB**	**Total**	**EB**	**WB**	**Total**
12:00 AM	3	1	4	2	1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	1	4
1:00 AM	0	0	0	1	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0	1
2:00 AM	7	2	9	6	2	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	2	9
3:00 AM	0	1	1	1	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	3
4:00 AM	3	8	11	2	8	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	8	11
5:00 AM	5	26	31	2	27	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	27	30
6:00 AM	11	46	57	23	45	68	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17	46	63
7:00 AM	39	69	108	28	60	88	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34	65	98
8:00 AM	50	**89**	139	46	**71**	**117**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48	**80**	**128**
9:00 AM	44	77	121	35	62	97	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40	70	109
10:00 AM	56	35	91	**60**	40	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	58	38	96
11:00 AM	**97**	50	**147**	40	19	59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**69**	35	103
12:00 PM	96	**46**	142	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48	**23**	71
1:00 PM	73	44	117	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37	22	59
2:00 PM	136	16	152	90	**16**	106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	113	16	129
3:00 PM	113	17	130	122	10	132	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	118	14	131
4:00 PM	160	14	174	146	4	150	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	153	9	162
5:00 PM	**169**	11	**180**	**185**	11	**196**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**177**	11	**188**
6:00 PM	84	10	94	76	6	82	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	80	8	88
7:00 PM	29	3	32	22	3	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	3	29
8:00 PM	11	4	15	9	3	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	4	14
9:00 PM	10	5	15	13	3	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	4	16
10:00 PM	1	1	2	8	2	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	2	6
11:00 PM	3	0	3	4	0	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	0	4
Total	1,200	575	1,775	921	396	1,317	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,061	486	1,546
Percent	68%	32%	-	70%	30%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	69%	31%	-
AM Peak	11:00	08:00	11:00	10:00	08:00	08:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11:00	08:00	08:00
Vol.	97	89	147	60	71	117	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	69	80	128
PM Peak	17:00	12:00	17:00	17:00	14:00	17:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17:00	12:00	17:00
Vol.	169	46	180	185	16	196	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	177	23	188

1. Mid-week average includes data between Tuesday and Thursday.

Project Manager: (415) 310-6469
project.manager.ca@idaxdata.com

Location: Driveway 3 West of Gateway Blvd
Date Range: 12/11/2019 - 12/17/2019
Site Code: 03

	Wednesday			Thursday			Friday			Saturday			Sunday			Monday			Tuesday					
	12/11/2019			12/12/2019			12/13/2019			12/14/2019			12/15/2019			12/16/2019			12/17/2019			Mid-Week Average		
Time	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total
12:00 AM	2	0	2	5	0	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	0	4
1:00 AM	3	1	4	3	0	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	1	4
2:00 AM	1	1	2	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1
3:00 AM	0	2	2	0	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	3	3
4:00 AM	10	17	27	5	6	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	12	19
5:00 AM	11	59	70	4	36	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	48	55
6:00 AM	23	68	91	20	78	98	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22	73	95
7:00 AM	34	116	150	42	114	156	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	38	115	153
8:00 AM	46	**154**	**200**	47	**139**	**186**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47	**147**	**193**
9:00 AM	46	114	160	**57**	109	166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	112	163
10:00 AM	52	69	121	52	69	121	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**52**	69	121
11:00 AM	**59**	58	117	34	46	80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47	52	99
12:00 PM	76	**65**	141	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	38	33	71
1:00 PM	60	60	120	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	30	60
2:00 PM	91	43	134	58	30	88	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	75	37	111
3:00 PM	93	41	134	99	47	146	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	96	44	140
4:00 PM	**134**	59	**193**	**100**	**52**	**152**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**117**	**56**	**173**
5:00 PM	113	39	152	98	45	143	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	106	42	148
6:00 PM	33	27	60	47	30	77	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40	29	69
7:00 PM	26	14	40	35	13	48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	31	14	44
8:00 PM	9	2	11	9	5	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	4	13
9:00 PM	11	1	12	3	6	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	4	11
10:00 PM	4	3	7	8	1	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	2	8
11:00 PM	4	2	6	5	1	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	2	6
Total	941	1,015	1,956	731	830	1,561	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	836	923	1,759
Percent	48%	52%	-	47%	53%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48%	52%	-
AM Peak	11:00	08:00	08:00	09:00	08:00	08:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10:00	08:00	08:00
Vol.	59	154	200	57	139	186	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	147	193
PM Peak	16:00	12:00	16:00	16:00	16:00	16:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16:00	16:00	16:00
Vol.	134	65	193	100	52	152	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	117	56	173

1. Mid-week average includes data between Tuesday and Thursday.

Project Manager: (415) 310-6469
project.manager.ca@idaxdata.com

Location: Driveway 4 West of Gateway Blvd
Date Range: 12/11/2019 - 12/17/2019
Site Code: 04

IDAX DATA SOLUTIONS

	Wednesday			Thursday			Friday			Saturday			Sunday			Monday			Tuesday					
	12/11/2019			12/12/2019			12/13/2019			12/14/2019			12/15/2019			12/16/2019			12/17/2019			Mid-Week Average		
Time	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total
12:00 AM	3	1	4	2	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	2	4
1:00 AM	0	0	0	3	0	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	0	2
2:00 AM	7	1	8	11	3	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	2	11
3:00 AM	0	1	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1
4:00 AM	11	13	24	8	9	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	11	21
5:00 AM	15	35	50	17	29	46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	32	48
6:00 AM	49	56	105	52	52	104	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	51	54	105
7:00 AM	116	118	234	105	112	217	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	111	115	226
8:00 AM	129	**164**	**293**	**136**	**154**	**290**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	133	**159**	**292**
9:00 AM	**135**	119	254	132	111	243	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**134**	115	249
10:00 AM	96	76	172	83	82	165	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	90	79	169
11:00 AM	97	84	181	94	67	161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	96	76	171
12:00 PM	102	57	159	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	51	29	80
1:00 PM	96	63	159	9	7	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	53	35	88
2:00 PM	136	48	184	160	47	207	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	148	48	196
3:00 PM	172	53	225	185	**73**	258	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	179	63	242
4:00 PM	209	**80**	**289**	**198**	62	**260**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**204**	**71**	**275**
5:00 PM	**210**	61	271	190	59	249	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	60	260
6:00 PM	108	30	138	107	29	136	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	108	30	137
7:00 PM	68	12	80	47	19	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	58	16	73
8:00 PM	25	6	31	39	7	46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	32	7	39
9:00 PM	9	5	14	25	7	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17	6	23
10:00 PM	22	11	33	11	9	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17	10	27
11:00 PM	16	2	18	9	5	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	4	16
Total	1,831	1,096	2,927	1,623	945	2,568	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,727	1,021	2,748
Percent	63%	37%	-	63%	37%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	63%	37%	-
AM Peak	09:00	08:00	08:00	08:00	08:00	08:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	09:00	08:00	08:00
Vol.	135	164	293	136	154	290	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	134	159	292
PM Peak	17:00	16:00	16:00	16:00	15:00	16:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16:00	16:00	16:00
Vol.	210	80	289	198	73	260	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	204	71	275

1. Mid-week average includes data between Tuesday and Thursday.

Location: Driveway 5 West of Gateway Blvd
Date Range: 12/11/2019 - 12/17/2019
Site Code: 05

	Wednesday			Thursday			Friday			Saturday			Sunday			Monday			Tuesday					
	12/11/2019			12/12/2019			12/13/2019			12/14/2019			12/15/2019			12/16/2019			12/17/2019			Mid-Week Average		
Time	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total
12:00 AM	9	3	12	7	0	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	2	10
1:00 AM	5	2	7	5	0	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	1	6
2:00 AM	7	3	10	7	2	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	3	10
3:00 AM	6	3	9	0	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	6
4:00 AM	5	6	11	11	6	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	6	14
5:00 AM	20	23	43	14	12	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17	18	35
6:00 AM	25	29	54	33	26	59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29	28	57
7:00 AM	45	52	97	44	60	104	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	45	56	101
8:00 AM	82	**81**	163	127	**76**	203	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	105	**79**	183
9:00 AM	**145**	78	**223**	**136**	74	**210**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**141**	76	**217**
10:00 AM	76	42	118	91	46	137	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	84	44	128
11:00 AM	129	36	165	130	51	181	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130	44	173
12:00 PM	101	**72**	173	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	51	36	87
1:00 PM	104	61	165	22	12	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	63	37	100
2:00 PM	147	39	186	149	50	199	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	148	45	193
3:00 PM	160	46	206	167	58	225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	164	52	216
4:00 PM	212	49	**261**	**235**	**59**	**294**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	224	**54**	**278**
5:00 PM	**233**	28	**261**	216	32	248	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**225**	30	255
6:00 PM	129	20	149	131	17	148	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130	19	149
7:00 PM	52	11	63	55	3	58	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	54	7	61
8:00 PM	23	7	30	26	7	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	7	32
9:00 PM	18	1	19	20	6	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	4	23
10:00 PM	18	2	20	16	1	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17	2	19
11:00 PM	8	0	8	11	4	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	2	12
Total	1,759	694	2,453	1,653	604	2,257	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,706	649	2,355
Percent	72%	28%	-	73%	27%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72%	28%	-
AM Peak	09:00	08:00	09:00	09:00	08:00	09:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	09:00	08:00	09:00
Vol.	145	81	223	136	76	210	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	141	79	217
PM Peak	17:00	12:00	16:00	16:00	16:00	16:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17:00	16:00	16:00
Vol.	233	72	261	235	59	294	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	225	54	278

1. Mid-week average includes data between Tuesday and Thursday.

Location: Driveway 6 South of Corporate Dr
Date Range: 12/11/2019 - 12/17/2019
Site Code: 06

IDAX DATA SOLUTIONS

	Wednesday			Thursday			Friday			Saturday			Sunday			Monday			Tuesday					
	12/11/2019			12/12/2019			12/13/2019			12/14/2019			12/15/2019			12/16/2019			12/17/2019			Mid-Week Average		
Time	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total
12:00 AM	3	0	3	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	0	2
1:00 AM	0	1	1	2	0	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	2
2:00 AM	2	0	2	2	0	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	0	2
3:00 AM	2	1	3	0	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	3
4:00 AM	3	3	6	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	4
5:00 AM	2	5	7	0	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	4	5
6:00 AM	2	10	12	2	9	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	10	12
7:00 AM	3	16	19	3	26	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	21	24
8:00 AM	4	45	49	6	**54**	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	50	55
9:00 AM	5	**65**	**70**	11	50	**61**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	**58**	**66**
10:00 AM	4	20	24	15	13	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	17	26
11:00 AM	**25**	10	35	**24**	18	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**25**	14	39
12:00 PM	19	19	38	1	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	11	21
1:00 PM	10	**23**	33	1	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	**14**	20
2:00 PM	14	10	24	6	5	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	8	18
3:00 PM	10	8	18	20	7	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	8	23
4:00 PM	35	6	41	36	**10**	46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36	8	44
5:00 PM	**42**	5	**47**	**44**	5	**49**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**43**	5	**48**
6:00 PM	28	3	31	20	4	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	4	28
7:00 PM	6	6	12	10	4	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	5	13
8:00 PM	3	2	5	3	3	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	6
9:00 PM	1	0	1	5	6	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	6
10:00 PM	0	1	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1
11:00 PM	3	0	3	1	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	0	2
Total	226	259	485	213	228	441	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	220	244	463
Percent	47%	53%	-	48%	52%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47%	53%	-
AM Peak	11:00	09:00	09:00	11:00	08:00	09:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11:00	09:00	09:00
Vol.	25	65	70	24	54	61	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	58	66
PM Peak	17:00	13:00	17:00	17:00	16:00	17:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17:00	13:00	17:00
Vol.	42	23	47	44	10	49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	43	14	48

1. Mid-week average includes data between Tuesday and Thursday.

Project Manager: (415) 310-6469
project.manager.ca@idaxdata.com

Location: Driveway 7 South of Corporate Dr
Date Range: 12/11/2019 - 12/17/2019
Site Code: 07

	Wednesday			Thursday			Friday			Saturday			Sunday			Monday			Tuesday					
	12/11/2019			12/12/2019			12/13/2019			12/14/2019			12/15/2019			12/16/2019			12/17/2019			Mid-Week Average		
Time	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total
12:00 AM	1	0	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0	1
1:00 AM	1	1	2	0	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	2
2:00 AM	0	1	1	0	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1
3:00 AM	0	2	2	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1
4:00 AM	1	5	6	2	10	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	8	9
5:00 AM	5	8	13	2	3	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	6	9
6:00 AM	0	6	6	2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	6	7
7:00 AM	4	11	15	2	3	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	7	10
8:00 AM	5	12	17	7	15	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	14	20
9:00 AM	8	**25**	**33**	10	**34**	**44**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	**30**	**39**
10:00 AM	**14**	19	**33**	**13**	13	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**14**	16	30
11:00 AM	8	11	19	6	15	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	13	20
12:00 PM	10	**12**	**22**	4	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	**8**	15
1:00 PM	**13**	5	18	8	5	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**11**	5	16
2:00 PM	11	7	18	**10**	**6**	**16**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**11**	7	**17**
3:00 PM	4	5	9	3	3	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4	8
4:00 PM	6	6	12	9	2	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	4	12
5:00 PM	8	1	9	6	1	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	1	8
6:00 PM	5	1	6	8	3	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	2	9
7:00 PM	3	0	3	0	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	2
8:00 PM	0	0	0	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	2
9:00 PM	2	0	2	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	3
10:00 PM	0	0	0	1	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0	1
11:00 PM	0	0	0	0	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1
Total	109	138	247	95	132	227	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	102	135	237
Percent	44%	56%	-	42%	58%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	43%	57%	-
AM Peak	10:00	09:00	09:00	10:00	09:00	09:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10:00	09:00	09:00
Vol.	14	25	33	13	34	44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	30	39
PM Peak	13:00	12:00	12:00	14:00	14:00	14:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13:00	12:00	14:00
Vol.	13	12	22	10	6	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	8	17

1. Mid-week average includes data between Tuesday and Thursday.

Project Manager: (415) 310-6469
project.manager.ca@idaxdata.com

Location: Driveway 8 East of Poletti Way
Date Range: 12/11/2019 - 12/17/2019
Site Code: 08

	Wednesday			Thursday			Friday			Saturday			Sunday			Monday			Tuesday					
	12/11/2019			12/12/2019			12/13/2019			12/14/2019			12/15/2019			12/16/2019			12/17/2019			Mid-Week Average		
Time	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total
12:00 AM	3	1	4	3	0	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	1	4
1:00 AM	4	2	6	4	0	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	1	5
2:00 AM	1	2	3	0	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	2
3:00 AM	1	0	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0	1
4:00 AM	11	0	11	13	0	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	0	12
5:00 AM	24	5	29	36	1	37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	3	33
6:00 AM	30	11	41	34	7	41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	32	9	41
7:00 AM	62	**15**	77	60	19	79	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	61	**17**	78
8:00 AM	104	11	115	141	13	154	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	123	12	135
9:00 AM	**164**	9	**173**	**155**	**23**	**178**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**160**	16	**176**
10:00 AM	38	10	48	42	18	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40	14	54
11:00 AM	43	10	53	36	12	48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40	11	51
12:00 PM	38	17	55	19	15	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29	16	45
1:00 PM	23	15	38	11	15	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17	15	32
2:00 PM	36	16	52	45	10	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	41	13	54
3:00 PM	49	24	73	21	23	44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35	24	59
4:00 PM	**54**	**25**	**79**	**61**	**31**	**92**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**58**	**28**	**86**
5:00 PM	45	15	60	33	14	47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	39	15	54
6:00 PM	30	9	39	24	9	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27	9	36
7:00 PM	22	3	25	13	3	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	3	21
8:00 PM	12	2	14	13	0	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	1	14
9:00 PM	11	0	11	6	0	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	0	9
10:00 PM	5	0	5	5	0	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	0	5
11:00 PM	7	0	7	8	2	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	1	9
Total	817	202	1,019	783	216	999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	800	209	1,009
Percent	80%	20%	-	78%	22%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	79%	21%	-
AM Peak	09:00	07:00	09:00	09:00	09:00	09:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	09:00	07:00	09:00
Vol.	164	15	173	155	23	178	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	160	17	176
PM Peak	16:00	16:00	16:00	16:00	16:00	16:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16:00	16:00	16:00
Vol.	54	25	79	61	31	92	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	58	28	86

1. Mid-week average includes data between Tuesday and Thursday.

Project Manager: (415) 310-6469
project.manager.ca@idaxdata.com

Location: Driveway 9 North of Corporate Dr
Date Range: 12/11/2019 - 12/17/2019
Site Code: 09

	Wednesday			Thursday			Friday			Saturday			Sunday			Monday			Tuesday					
	12/11/2019			12/12/2019			12/13/2019			12/14/2019			12/15/2019			12/16/2019			12/17/2019			Mid-Week Average		
Time	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total
12:00 AM	4	0	4	6	0	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	0	5
1:00 AM	2	0	2	2	0	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	0	2
2:00 AM	2	0	2	4	0	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	0	3
3:00 AM	6	0	6	4	0	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	0	5
4:00 AM	25	0	25	22	1	23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	1	24
5:00 AM	84	0	84	89	1	90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	87	1	87
6:00 AM	132	1	133	171	0	171	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	152	1	152
7:00 AM	227	5	232	249	1	250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	238	3	241
8:00 AM	**344**	6	**350**	**357**	7	**364**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**351**	7	**357**
9:00 AM	323	2	325	314	6	320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	319	4	323
10:00 AM	155	3	158	120	5	125	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	138	4	142
11:00 AM	85	**12**	97	92	**10**	102	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	89	**11**	100
12:00 PM	66	17	83	46	8	54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	56	13	69
1:00 PM	**90**	10	**100**	56	3	59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	73	7	80
2:00 PM	55	21	76	61	20	81	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	58	21	79
3:00 PM	65	**26**	91	78	7	85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72	17	88
4:00 PM	70	**26**	96	**79**	**26**	**105**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**75**	**26**	**101**
5:00 PM	58	25	83	55	21	76	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	57	23	80
6:00 PM	38	12	50	36	12	48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37	12	49
7:00 PM	28	3	31	33	5	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	31	4	35
8:00 PM	12	1	13	21	2	23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17	2	18
9:00 PM	6	1	7	9	0	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	1	8
10:00 PM	5	0	5	9	0	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	0	7
11:00 PM	11	0	11	11	1	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	1	12
Total	1,893	171	2,064	1,924	136	2,060	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,909	154	2,062
Percent	92%	8%	-	93%	7%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	93%	7%	-
AM Peak	08:00	11:00	08:00	08:00	11:00	08:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	08:00	11:00	08:00
Vol.	344	12	350	357	10	364	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	351	11	357
PM Peak	13:00	15:00	13:00	16:00	16:00	16:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16:00	16:00	16:00
Vol.	90	26	100	79	26	105	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	75	26	101

1. Mid-week average includes data between Tuesday and Thursday.