San Francisco
County Transportation
Authority

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Addendum #1

Request for Proposals for Design and Engineering Services for I-280 Ocean Avenue Off-Ramp Project

Date RFP Issued	Date Addendum #1 Issued	Proposals Due	Contact
January 4, 2022	January 6, 2022	February 11, 2022 at 2:00 p.m. [electronically]	Ron Leong Management Analyst 415.522.4817 Ronald.leong@sfcta.org

ADDENDUM #1

Proposers are hereby notified of the following redline revisions to the Request for Proposals for Design and Engineering Services for I-280 Ocean Avenue Off-Ramp Project (RFP 21/22-13) issued on January 4, 2022. **Proposers shall include in their response acknowledgement of this addendum in their cover letter.**

ADDENDUM #1, A

SECTION III – BACKGROUND: PROJECT BACKGROUND AND PURPOSE is amended as follows:

…

Additional background information can be found in Appendices and Exhibits

- Appendix A – Project Study Report-Project Report
- Appendix B – Preliminary Geotechnical Report
- Appendix C – Stormwater Data Report
- Appendix D – Visual Impact Assessment

ADDENDUM #1, B

The following appendices are added in its entirety to the Appendices and Exhibits section of RFP 21/22-13:

- Appendix A – Project Study Report-Project Report
- Appendix B – Preliminary Geotechnical Report
- Appendix C – Stormwater Data Report

- Appendix D – Visual Impact Assessment

Appendix A

Project Study Report-Project Report

For Project Approval

On Route Interstate-280

Location Southbound I-280 Off-Ramp intersection with Ocean Avenue

I have reviewed the right of way information contained in this report and the right of way data sheet attached hereto, and find the data to be complete, current, and accurate:

APPROVAL RECOMMENDED:

Mark L. Weaver, Deputy District Director,
Right of Way and Land Surveys

APPROVAL RECOMMENDED:

Mike Tan, SFCTA, Accepts risks identified in this
PSR-PDS and attached risk register

APPROVAL RECOMMENDED:

Al B. Lee

Al B. Lee, Project Manager

PROJECT APPROVED:

Dina El Tawansy, Acting District Director

01/19/2021
Date

Vicinity Map

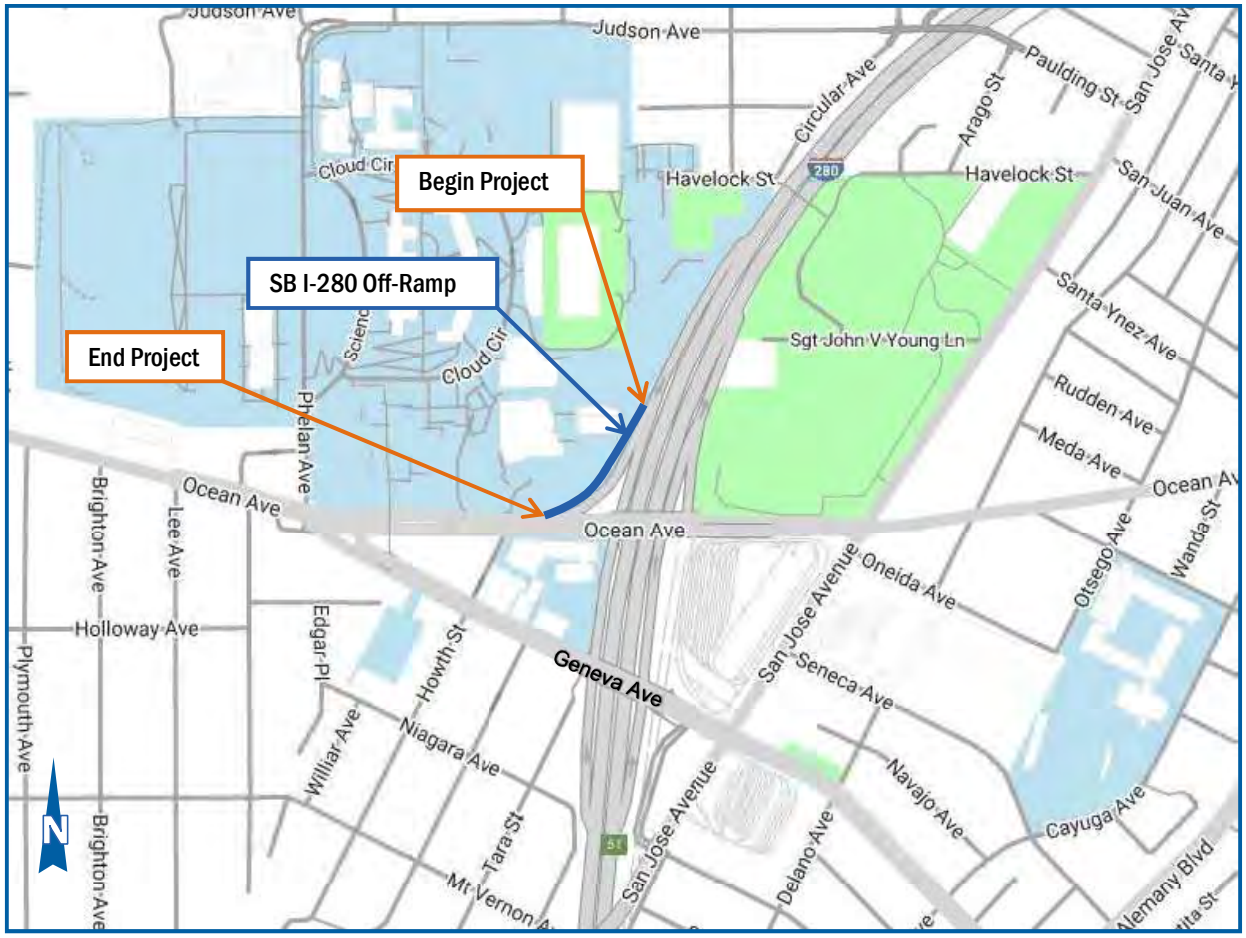

Figure 1 – Vicinity Map

This Project Study Report-Project Report has been prepared under the direction of the following registered civil engineer. The registered civil engineer attests to the technical information contained herein and the engineering data upon which recommendations, conclusions, and decisions are based.

David J Fyfe

10/02/2020

REGISTERED CIVIL ENGINEER *DATE*

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List of Acronyms and Abbreviations

AADT	Annual Average Daily Traffic
ADA	Americans with Disabilities Act
AMM	Avoidance and Minimization Measure
APE	Area of Potential Effects
AWSS	Auxiliary Water Supply System
BART	Bay Area Rapid Transit
BMP	best management practice
BPSAC	Balboa Park Station Community Advisory Committee
BSA	biological study area
Caltrans	California Department of Transportation
CCSF	City College of San Francisco
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
City	City of San Francisco
CFR	Code of Federal Regulations
CPUC	California Public Utilities Commission
CGP	Construction General Permit
CWA	Clean Water Act
DIB	Design Information Bulletin
EA	Environmental Assessment
EBL	eastbound left
EBT	eastbound through
EBTR	eastbound through/right
EIS	Environmental Impact Statement
ESA	Environmentally Sensitive Area
FHWA	Federal Highway Administration
F+I	fatal plus injury
FONSI	Finding of No Significant Impact
GHG	Greenhouse Gas
GO	General Order
HCM 2000	Highway Capacity Manual
HDM	Highway Design Manual
HSIP	Highway Safety Improvement Program
I-280	Interstate 280
ICE	Intersection Control Evaluation
ISA	Initial Site Assessment
LOS	Level of Service
LRV	light-rail vehicle

mph	miles per hour
Muni	San Francisco Municipal Railway
MS4	Municipal Separate Sewer System
MT	Metric Ton
MTC	Metropolitan Transportation Commission
MV	million vehicles
MVM	million vehicle miles
NAVD 88	North American Vertical Datum of 1988
NB	northbound
NBL	northbound left
NBLR	northbound shared left/right
NBLTR	northbound shared left/through/right
ND	Negative Declaration
NEPA	National Environmental Policy Act
NES-MI	Natural Environment Study (Minimal Impact)
NGVD 29	National Geodetic Vertical Datum of 1929
NPDES	National Pollutant Discharge Elimination System
OACBD	Ocean Avenue Community Benefit District
OC	overcrossing
OCS	overhead contact system
PA&ED	project approval and environmental document
PG&E	Pacific Gas and Electric Company
PM	Post Mile
PR/ED	project report/environmental document
PS&E	plan, specification, and estimate
PSR-PR	Project Study Report-Project Report
PSI	Preliminary Site Investigation
RTL	ready to list
SB	southbound
SBLT	southbound left/through
SBLTR	southbound shared left/through/right
SBR	southbound right
SBT	southbound through
sec/veh	seconds per vehicle
SFBRWQCB	San Francisco Bay Regional Water Quality Control Board
SFCTA	San Francisco County Transportation Authority
SFDPH	San Francisco Department of Public Health
SFMTA	San Francisco Municipal Transportation Agency
SFPUC	San Francisco Public Utilities Commission
SFPW	San Francisco Public Works

SWPPP	Storm Water Pollution Prevention Plan
TASAS	Traffic Accident Surveillance and Analysis System
TCR	Transportation Concept Report
TMP	Traffic Management Plan
TOAR	Traffic Operational Analysis Report
USFWS	U.S. Fish and Wildlife Service
WB	westbound
WBT	westbound through
WBTR	westbound through/right
WPCP	Water Pollution Control Program

1. INTRODUCTION

To create a safer multi-modal environment, the San Francisco County Transportation Authority (SFCTA), in cooperation with the California Department of Transportation (Caltrans), proposes to modify the existing southbound (SB) Interstate 280 (I-280) off-ramp to Ocean Avenue.

Two alternatives were investigated for this project, a No Build Alternative, and a Build Alternative. The No Build Alternative proposes no modifications to the existing I-280 ramp configuration. The Build Alternative proposes the realignment and widening of the existing southbound I-280 off-ramp at Ocean Avenue from a free-right turn to a two-lane T-intersection. The proposed intersection will be controlled by a traffic signal, which will provide controlled crossing for pedestrians. The total estimated project cost for the Build Alternative is $21.05M.

A Categorical Exemption pursuant to the California Environmental Quality Act (CEQA) was prepared for the project. The National Environmental Policy Act (NEPA) approval will be obtained once the Project is programmed.

The project is anticipated to be ready to advertise for bid in the spring of 2022. Construction is scheduled to begin in the summer of 2022 and be completed by the winter of 2023.

Project information is summarized in Table 1.

Table 1
Project Information

Project Limits (District-Co-Route, Post Mile [PM])	04-SF-280, PM 1.8/PM 2.0
Number of Alternatives	2
Alternative Recommended for Programming	2
Current Capital Outlay Support Estimate	$4.96 million
Current Capital Outlay Construction Estimate	$13.92 million
Current Capital Outlay Right of Way Estimate	$2.17 million
Funding Source	Local – Proposition K Expenditure Plan State – Local Partnership Program Federal – Highway Safety Improvement Plan (HSIP)
Funding Year	2023 for construction
Type of Facility (conventional, expressway, freeway)	Freeway off-ramp

Number of Structures	1
Environmental Determination or Document	Categorical Exemption (CEQA)
Legal Description	In San Francisco County in the City of San Francisco on I-280 at the SB off-ramp at Ocean Avenue (PM 1.8-2.0)
Project Development Category	5

2. RECOMMENDATION

It is recommended that this Project Study Report – Project Report (PSR-PR) be approved and that the project proceed to final design.

3. BACKGROUND

3A. Project History

The Balboa Park Station Area, on the central south side of San Francisco, is a busy and multifaceted hub of transportation activity. Home to one of the busiest Bay Area Rapid Transit (BART) stations outside of Downtown San Francisco, a San Francisco Municipal Transportation Agency (SFMTA) San Francisco Municipal Railway (Muni) light rail terminal and maintenance facility, multiple bus lines along Geneva Avenue and Ocean Avenue, and a historic streetcar depot, this area is one of the most important and heavily used transit hubs in the region. I-280 traverses the neighborhood, with six freeway ramps tying into the local street network directly adjacent to the BART station. Although this interchange provides vehicular access to regional transit and other neighborhood destinations, it also contributes to congestion, safety, and access issues, and degrades the quality of the surrounding area.

Multiple planning and engineering feasibility studies have explored ways to improve various aspects of the station area, including the Planning Department's 2009 *Balboa Park Station Area Plan*, the SFMTA's 2009 *Balboa Park Station Pedestrian and Bicycle Connection Project*, and the SFMTA's 2011 *Balboa Park Station Capacity and Conceptual Engineering Study*. The most recent study, "2014 Balboa Park Circulation Study," focused on reconfigurations of the I-280 Geneva Avenue and Ocean Avenue freeway ramps that could further improve station access, circulation, and safety. The selected recommendation from this study is to realign the I-280 SB off-ramp at Ocean Avenue with signal control to enhance bicycle and pedestrian safety.

This project meets the requirements for a combined Project Study Report-Project Report (PSR-PR) outlined in Chapter 9 of the Caltrans Project Development Procedures Manual. Caltrans approved on February 10, 2016 the City's request for the use of a combined PSR-PR, as the project initiation document and project approval document.

3B. Community Interaction

SFCTA has led the public outreach process, including frequent community interaction. Extensive outreach was done to ensure the members of the community were notified of the community meetings to discuss the project, including the following:

- Email notifications to thirty community-based organizations, including the Balboa Park Email Group;
- Distribution of over 500 meeting announcement flyers to the Balboa Park Station Area's surrounding businesses, grocery stores/corner markets, libraries, schools, community centers, gathering places, and transit shelters;
- Muni bus banner ads displayed on local lines to promote the project and notify the public of the meetings;
- Mailer notification to all addresses within a 300-foot radius of the primary project area (3,740 total); and,
- Media advisory was issued to various media outlets in advance of the meetings.

Beginning in 2013, a total of 7 meetings were held to notify the community stakeholders of the project intent and keep them informed of the status of the project. Balboa Park residents are generally supportive of improving pedestrian and bicycle safety and movement, and transit service. There is particular agreement with the Balboa Park Circulation Study's identification of key pedestrian safety, access issues and traffic circulation.

The Balboa Park Station Community Advisory Committee (BPSCAC) is an advisory body to the SFMTA, and provides recommendations on local transportation issues. The BPSCAC was informed of the Balboa Park Circulation Study and project through informational presentations and updates during the regularly scheduled meetings. In March of 2014, the BPSCAC voted to support adoption of the Balboa Park Circulation Study and the project. SFCTA later gave project update presentations to BPSCAC on December 16th, 2014 and July 25th, 2017.

SFCTA also gave presentations to the Ocean Avenue Community Benefit District (OACBD) on Wednesday March 21st, 2018 at Lick-Wilmerding High School. OACBD represents 148 properties along Ocean Avenue from Manor Drive to I-280. These properties include commercial, retail, educational, non-profit and residential uses. SFCTA received various comments from OACBD members. Many expressed desire to improve traffic congestion between Phelan Avenue and I-280, and to implement the San Francisco Department of Planning's 2015 Ocean Avenue Corridor Design Study, which includes this project. Members have also expressed interest in the safe crossing of pedestrians and bicyclist. OACBD provided a letter of support for

the project. SFCTA will continue to perform outreach with local community and stakeholders throughout the design and construction phase.

3C. Existing Facility

I-280 runs adjacent to the Balboa Park BART Station and has six ramp connections in the immediate vicinity of the station. I-280 is a six- to eight-lane major freeway that serves as a major regional connector between the City of San Jose, the communities of San Mateo County, and downtown San Francisco.

Within the I-280 Interchange Modification project limits, I-280 on-ramps and off-ramps are in the vicinity of the Balboa Park BART Station on Geneva Avenue and Ocean Avenue. At Geneva Avenue, on- and off-ramps are provided in both northbound (NB) and SB directions. Partial freeway connections are provided at Ocean Avenue—a SB off-ramp (to WB Ocean Avenue only) which is about 570 feet to the north of the Geneva Avenue off-ramp, and a NB on-ramp which is about 650 feet to the north of the Geneva Avenue on-ramp.

Geneva Avenue is an east-west arterial street that connects Balboa Park and Visitacion Valley, stretching from Phelan Avenue to Bayshore Boulevard. Within the project limits, Geneva Avenue has a speed limit of 25 miles per hour (mph). Excluding the station entrance plaza area, sidewalks range from 6 to 8 feet in width. The main entrance to the Balboa Park BART Station faces Geneva Avenue, between I-280 and San Jose Avenue. Pedestrian activity is high on Geneva Avenue in the immediate vicinity of the BART station, as well at the I-280 ramps and San Jose Avenue intersections.

Ocean Avenue is a major east-west arterial street that connects the major commercial and residential neighborhoods, transit hub, and City College of San Francisco (CCSF) and Lick Wilmerding High School. Ocean Avenue is the primary east-west bicycle route through the area, and the project intersection experiences high volumes of pedestrian traffic. The roadway varies from two to four lanes in the project vicinity. At the intersection of the SB I-280 off-ramp and Ocean Avenue, there are six lanes of traffic on Ocean Avenue: one vehicular and one shared bicycle/vehicular lane in each east-west direction and two center-running light-rail vehicle (LRV)-only lanes. The Class II bike lane running west on Ocean Avenue is dropped in advance of the merge with the SB I-280 off-ramp. Ocean Avenue takes precedence over Geneva Avenue as the primary east-west bicycle route through the project study area. The posted speed limit on this segment of Ocean Avenue is 25 mph.

The current configuration of the SB I-280 off-ramp is a single-lane free-right turn onto Ocean Avenue and a continuation of the ramp to Geneva Avenue. The existing I-280 SB off-ramp at Ocean Avenue consists of one 12-foot-wide lane with a 3–foot-wide right shoulder and a 2–foot-wide left shoulder. The off-ramp has a design speed of 40 mph and exits westbound (WB) onto Ocean Avenue as a free-right turn.

4. PURPOSE AND NEED

4A. Project Purpose

The purpose of this project is to improve safety along Ocean Avenue at the SB I-280 off-ramp intersection.

4B. Project Need

The current configuration of the SB I-280 off-ramp intersection with Ocean Avenue creates potential conflicts between multi-modal users.

The current configuration of the SB I-280 off-ramp is a single-lane, free-right turn onto WB Ocean Avenue just prior to the intersection with Howth Street. The ramp becomes a new rightmost lane as it joins WB Ocean Avenue. When vehicles on WB Ocean Avenue attempt to shift to the right lane immediately past the ramp merge area to turn right at Howth Street into CCSF, they are required to merge with vehicles exiting the off-ramp over a short distance of approximately 150 feet.

The project area supports a high volume of pedestrian traffic due to the vicinity of the Balboa Park BART and Muni stations. Additionally, there are pedestrian destinations in the vicinity of the Balboa Park neighborhood, such as the CCSF, Lick-Wilmerding High School, Balboa Park, and neighborhood retail along Ocean Avenue to the west of the college. The current ramp configuration requires pedestrians traveling along the northern side of Ocean Avenue to cross the SB I-280 off-ramp at an uncontrolled crosswalk where vehicles exit the freeway at high speeds.

Ocean Avenue is the primary east-west bicycle route in the area, with a mix of Class II bicycle lanes and Class III bicycle routes in each direction. The SFMTA's draft multi-modal hierarchy[1] identifies this segment of Ocean Avenue as a highest priority segment of the bicycle network, based on demand and hilliness. The current ramp configuration requires WB cyclists attempting to stay in the rightmost lane to merge into the lane populated by vehicles exiting the freeway at high speeds.

According to the San Francisco Department of Public Health (SFDPH) TransBASE database, between 2005 and 2015 there were two pedestrian injuries, four bicycle injuries, and six vehicle injuries in the area at the intersection of Ocean/SB I-280/ Howth.[2] This intersection has been identified as a "High Injury Intersection" in San Francisco's Vision Zero Action Strategy.[3]

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[1] Draft Multi-Modal Hierarchy. SFMTA, 2016: not available online.

[2] TransBASE: Linking Transportation Systems to Our Health. San Francisco Department of Public Health, 2016: http://transbasesf.org/transbase/.

[3] Vision Zero San Francisco Two-Year Action Strategy 2017-18. City and County of San Francisco, 2016: http://visionzerosf.org/about/two-year-action-strategy/.

This segment of Ocean Avenue has also been identified as part of the Vision Zero "High Injury Network," and is specifically a high-injury corridor for cyclists. The Vision Zero Action Strategy calls for redesign of corridors and intersections, with treatments to increase safety and reduce fatal crashes by improving visibility, calming traffic speeds, and encouraging road user compliance. Furthermore, the intersection displays several of the issues identified by the Caltrans Complete Intersections Guide[4] as affecting free-flow ramps, including motorists traveling at high speed and unlikely to yield, acute intersection angle limiting visibility, and bicyclists forced to weave. This guide recommends a T-intersection as one of the top recommended treatments to improve multi-modal safety.

5. DEFICIENCIES

The current configuration of the SB I-280 off-ramp is a single-lane, free-right turn onto WB Ocean Avenue just prior to the intersection with Howth Street. The vehicles exiting the SB I-280 off-ramp are required to merge with vehicles on Ocean Avenue. When vehicles on WB Ocean Avenue attempt to shift to the right lane immediately past the ramp merge area to turn right at Howth Street into CCSF, they are required to merge with vehicles exiting the off-ramp over a short distance of approximately 150 feet. The SB freeway exit onto Ocean Avenue is a high-speed, uncontrolled ramp that has limited visibility, with high pedestrian and bicycle conflicts.

The current ramp configuration presents a challenge to the pedestrians attempting to cross the intersection of the SB I-280 off-ramp with Ocean Avenue. The vehicles exit the freeway at high speeds, which has the potential to create unsafe conditions for pedestrians crossing the off-ramp. This intersection was identified as a "High Collision Density Intersection" by the SFDPH as part of their WalkFirst pedestrian safety analysis from 2005 through 2011.

Ocean Avenue is the primary east-west bicycle route in the area, with a mix of Class II bicycle lanes and Class III bicycle routes in each direction. The presence of a free-right turn from the SB I-280 off-ramp onto WB Ocean Avenue creates a potential conflict between bicycles travelling WB on Ocean Avenue and vehicles exiting the freeway. NB freeway access from Ocean Avenue experiences high pedestrian, bicycle, and transit conflicts.

6. CORRIDOR AND SYSTEM COORDINATION

6A. Identify Systems

The proposed project is on the Interstate System. I-280 is part of the Department of Defense Rural and Single Interstate Route System, and is listed on the National Highway System as required by the Intermodal Surface Transportation Efficiency Act

[4] Complete Intersections: A Guide to Reconstructing Intersections and Interchanges for Bicyclists and Pedestrians, Section 9.1. Caltrans, 2010: http://www.dot.ca.gov/trafficops/ped/.

of 1991. It is designated to carry over-length trucks in accordance with the Surface Transportation Assistance Act.

6B. State Planning

The I-280 Transportation Concept Report (TCR) is a Caltrans long-range planning document that informs the regional transportation planning process. The TCR provides information regarding route segments, including high-priority projects for the highway through 2035, and existing and forecasted traffic data.

San Francisco has a dense network of local roads paralleling the freeway, but ramp intersections with city streets present challenges to bicycle connectivity. The TCR identifies bicycle and pedestrian strategies that are aimed at integrating and enhancing networks along and across the I-280 Corridor. One of the recommended strategies is to incorporate bicycle facility design treatments, including ramp reconstruction to intersect at a 90-degree angle.

The TCR states that many ramp intersections with local roads throughout the I-280 corridor present challenges for pedestrian movement. They create barriers to walking where housing, employment, and shopping destinations are situated on both sides of the freeway (conflicts at free-flow on- and off-ramps, high motor vehicle speeds, absence of sidewalks and crosswalks).

The TCR also recommends the removal of barriers to pedestrian circulation by squaring up ramp intersections to reduce the speed of turning vehicles and shorten crossing distances; by striping crosswalks at on- and off-ramps along ramp termini to direct pedestrians and notify motorists of the presence of the crosswalks; and by adding countdown signals.

The Transportation System Development Plan recommended areas of interest specific to interregional travel, including the Complete Streets Implementation Action Plan. A complete street is a transportation facility that is planned, designed, operated, and maintained to provide safe mobility for all users. The Complete Streets Implementation Action Plan (2010) put Caltrans Deputy Directive 64-R2 “Complete Streets–Integrating the Transportation System” into action. All transportation improvements (new and retrofit) are viewed as opportunities to improve safety, mobility, and access for all travelers, including transit users, bicyclists, and pedestrians.

The Caltrans District 4 Bike Plan, published in 2018, identifies infrastructure improvements that can enhance bicycle safety and mobility through District 4.The plan proposes to install Class II buffered bike lanes or Class IV bikeways on Ocean Avenue in the event of an interchange reconstruction.

The proposed project is made consistent with the state planning documents by implementing a T-intersection to improve bicycle and pedestrian safety at the SB I-280 off-ramp intersection.

6C. Regional Planning

The Metropolitan Transportation Commission's (MTC's) Transportation 2035 Plan aims to stimulate the use of public transit; increase the safety, utility, and appeal of bicycling and walking; and reduce miles traveled and emissions by cars and trucks in the Bay Area while increasing the efficiency of the roadway and transit systems for all users.

The proposed build alternative is consistent with the regional planning goals because it will improve safety and encourage bicycle and pedestrian activity in the area.

6D. Local Planning

Previous plans in the study area, including the Planning Department's 2009 *Balboa Park Station Area Plan* and the SFMTA's 2012 *Balboa Park Station Capacity and Conceptual Engineering Study*, recommended multiple improvement concepts. Of those recommendations, several short-term bicycle/pedestrian safety projects were identified. The SFMTA's 2011 *Balboa Park Station Capacity and Conceptual Engineering Study* provided engineering feasibility analysis and planning recommendations for the long-range concepts identified in the *Balboa Park Station Area Plan*.

Several projects were identified that are adjacent to the proposed build alternative. These include:

- Pedestrian beacon at I-280 SB off-ramp on Ocean Avenue;
- Westside Walkway between Ocean Avenue and the BART station;
- Signal at Geneva Avenue/Howth Street Pedestrian and Bicycle Connections Project;
- Ocean Avenue/NB I-280 crosswalk; and
- Westbound Ocean Avenue bicycle lane.

The proposed build alternative will replace the existing pedestrian beacon at I-280 SB Off-Ramp on Ocean Avenue with a signalized T-intersection and will enhance the safety improvement. This project is consistent with local planning because it will improve pedestrian and bicycle safety.

6E. Transit Operator Planning

SFMTA currently operates one light rail line and two bus lines along Ocean Avenue through the project limits. The Balboa Park BART Station is close to the Ocean

Avenue intersection with the SB I-280 off-ramp. The build alternative will not impact the current and/or planned operations of these transit facilities, and is expected to encourage use of these facilities by enhancing bicycle/pedestrian safety.

7. PREFERRED ALTERNATIVE

7A. Preferred Alternative (Proposed Project Improvements)

The Preferred Alternative includes modifications to the existing SB I-280 off-ramp at Ocean Avenue. This alternative includes the following components:

- Elimination of the existing free-right turn lane for vehicles exiting the SB I-280 off-ramp just prior to the Ocean Avenue/Howth Street intersection;
- Realignment and widening of the existing I-280 southbound off-ramp at Ocean Avenue to a two-lane T-intersection at Ocean Avenue; and
- Installation of a traffic signal at the realigned SB I-280 off-ramp/Ocean Avenue intersection.

The realignment and widening of the existing SB I-280 off-ramp at Ocean Avenue to two lanes will require the construction of a retaining wall approximately 680 feet long, with a maximum height of 20 feet. Construction of the retaining wall will require excavation to a maximum depth of 25 feet. Enhanced signing and striping will be investigated during the final design phase to reduce the risk of wrong-way movements at the proposed T-intersection. A simple fee acquisition will be required to accommodate a portion of the proposed retaining wall. A temporary construction easement of up to approximately 20 feet by 200 feet and an underground easement for retaining wall tie-backs and/or retaining wall foundations will be required along the western side of the existing ramp. Tie-backs may extend below the footprint of the existing CCSF building, but the design will minimize any impacts. The project will require CCSF concurrence of location of tie-backs within their property.

Nonstandard Mandatory Design Features

Exceptions from the Caltrans Highway Design Manual (HDM) design standards have been identified for the Preferred Alternative. Fact Sheets for exceptions to mandatory design standards were approved by Caltrans on July 18th, 2018, for the features noted in Tables 2 through 7.

Nonstandard Local Street Interchange

The project proposes to maintain the existing condition of a nonstandard local street interchange. Elimination of the existing isolated southbound Ocean Avenue off-ramp and northbound Ocean Avenue on-ramp would meet the design standard. However, the removal of the existing off-ramp at Ocean Avenue would divert the majority of current Ocean Ave off-ramp traffic onto the Geneva Avenue interchange. The increase in volume would greatly reduce the intersection operations at the Geneva Avenue/I-280 intersection as well as multiple adjacent local city street intersections,

which would increase the off-ramp queues and could have impact on mainline operations. The proposed nonstandard design is summarized in Table 2.

Table 2
Nonstandard Local Street Interchange

Location	Required Local Street Interchange	Existing Local Street Interchange	Proposed Local Street Interchange
I-280/Ocean Avenue Interchange	Isolated Off-Ramps shall not be used	Isolated Off-Ramp	Isolated Off-Ramp

Nonstandard Intersection Spacing

The distance between the Ocean Avenue off-ramp and the Howth/Ocean intersection does not meet the Caltrans Mandatory Design Standard. The proposed nonstandard design is summarized in Table 3.

Table 3
Nonstandard Intersection Spacing

Location	Required Minimum Distance Between Ramp and Local Road Intersection	Existing Distance Between Ramp and Local Road Intersection	Proposed Distance Between Ramp and Local Road Intersection
Distance between SB Off-Ramp/Ocean Ave. Intersection and Howth Street /Ocean Ave. Intersection	400 feet	171 feet	292 feet

Nonstandard Stopping Sight Distance

The sag vertical curve after the exit nose of the SB I-280 off-ramp has a nonstandard stopping sight distance of 170 feet, which corresponds with a design speed of 25 mph. A 40-mph design would need a stopping sight distance of 300 feet. The proposed nonstandard design is summarized in Table 4.

Table 4
Nonstandard Stopping Sight Distance

Location	Required Stopping Sight Distance	Existing Stopping Sight Distance	Proposed Stopping Sight Distance
Sag vertical curve after exit nose of SB I-280 Off-Ramp	300 feet	N/A	170 feet

Nonstandard Shoulder Width of Local Facility

The existing shoulder of westbound Ocean Avenue has a nonstandard width of 0 feet. The proposed shoulder of westbound Ocean Avenue varies from 8 feet down to 0 feet where it conforms to the existing roadway dimensions. The proposed nonstandard design is summarized in Table 5.

Table 5
Nonstandard Shoulder Width of Local Facility

Location	Required Shoulder Width	Existing Shoulder Width	Proposed Shoulder Width
Northern shoulder of Ocean Avenue west of proposed I-280 SB Off-Ramp intersection	Match existing, but not less than 4 feet	0 feet	Varies 8 feet to 0 feet

Nonstandard Shoulder Width of Local Facility

The speed limit of Ocean Avenue is less than the required minimum design speed for local facilities connecting to a freeway or expressway. The proposed design speed of 25 mph is consistent with the existing Ocean Avenue posted speed limit of 25 mph. Because this area is in a school zone, the speed limit is mandated by California State law. California vehicle code 22358.4 states that the speed limit shall be a maximum of 25 mph when approaching or passing a school building. The proposed nonstandard design is summarized in Table 6.

Table 6
Nonstandard for Minimum Design Speed for a Local Facility

Location	Required Minimum Design Speed	Existing Posted Speed Limit	Proposed Minimum Design Speed
Ocean Avenue	35 mph	25 mph	25mph

Nonstandard Access Control

The access rights at the interchange along the southern side of Ocean Avenue and directly south of the proposed southbound I-280 off-ramp intersection with Ocean Avenue does not meet the Caltrans Mandatory Design Standard. The proposed nonstandard design is summarized in Table 7.

Table 7
Nonstandard Access Control

Location	Required Access Control	Existing Access Control	Proposed Access Control
Directly south of proposed SB I-280 Off-Ramp Intersection with Ocean Avenue	Required on opposite side of the local road from ramp terminal	Not provided on opposite side of local road from ramp terminal	Not provided on opposite side of local road from ramp terminal

Nonstandard Advisory Design Features

Exceptions from the Caltrans HDM design standards have been identified for the Preferred Alternative. Fact Sheets for exceptions to advisory design standards were approved by Caltrans on June 27, 2018, for the features noted in Tables 8 and 9.

Nonstandard Side Slope

Side slopes do not meet the Caltrans Advisory Design Standard throughout a portion of the off-ramp; 2:1 side slopes are proposed along the eastern and western embankments from "B" Station 14+36 to 16+60. The proposed nonstandard design is summarized in Table 8.

Table 8
Nonstandard Side Slope

Location	Required Side Slope	Existing Side Slope	Proposed Side Slope
Eastern and western embankments along SB I-280 Off-Ramp from "B" Station 14+36 to 16+60	4:1 Embankment (fill) slope	4:1	2:1

Nonstandard Deceleration Length

There is one location where deceleration length does not meet the Caltrans Advisory Design Standard, immediately after the departure of the SB I-280 Off-Ramp to Ocean Avenue from the combined SB Geneva Avenue/Ocean Avenue Off-Ramp. The proposed nonstandard design is summarized in Table 9.

Table 9
Nonstandard Deceleration Length

Location	Required Deceleration Length	Existing Deceleration Length	Proposed Deceleration Length
Immediately after the departure of the SB I-280 Off-Ramp to Ocean Ave. from Combined SB Geneva /Ocean Ave. Off-Ramp	270 feet	250 feet	200 feet

I-280 Mainline Existing Non-Standard Features to Remain

Existing exceptions from the Caltrans Highway Design Manual (HDM) design standards have been identified for the I-280 mainline running adjacent to the Project Area. These existing nonstandard design features described herein were identified in the context of the existing mainline facility and as the mainline facility will exist after implementation of the Project. A Memo-to-File documenting the existing nonstandard mandatory design features that are to remain was approved by Caltrans on September 17, 2020.

- **Nonstandard Stopping Sight Distance** – Caltrans HDM 7th edition (July 1, 2020, page 200-1), Topic 201 – Sight Distance, Index 201.1 – General, Table 201.1 specifies that a stopping sight distance of **750 feet** is required for a design speed of 70 mph for motorists.

  The I-280 mainline adjacent to the Project Areas has a nonstandard stopping sight distance of approximately **465 feet** and a corresponding design speed of approximately 52 mph.

- **Nonstandard Superelevation** – Caltrans HDM, 7th edition (July 1, 2020, page 200-10), Topic 202 – Superelevation, Index 202.2 – Standards for Superelevation specifies that Freeways, Expressways and Multilane Conventional Highways shall be designed with an e_{max} = 10% in compliance with Table 202.D. Table 202.2D shows that a horizontal curve radius of 3,530 feet with a design speed of 70 mph requires a superelevation rate of **5.8%**.

  The existing I-280 mainline running adjacent to the project area has a horizontal curve radius of approximately 3,600 feet and a nonstandard superelevation rate of approximately **2.0%.**

- **Nonstandard Shoulder Width** – Caltrans HDM, 7th edition (July 1, 2020, page 300-5), Topic 302 – Highway Shoulder Standards, Index 302.1, Table 302.1 specifies that the minimum continuous usable width of paved shoulders for 6 or more lane freeways shall be **10 feet** on each side.

The left shoulder of the existing I-280 southbound mainline has a nonstandard width of approximately **2 feet** along the project area and the right shoulder has a nonstandard width of approximately **8 feet** beneath the Ocean Avenue overcrossing structure. The left shoulder of the existing I-280 northbound mainline adjacent to the project area has a nonstandard width of approximately **9 feet** and the right shoulder has a nonstandard width of approximately **8 feet**.

- **Nonstandard Horizontal Clearance –** Caltrans HDM, 7th edition (July 1, 2020, page 300-35), Topic 309 – Clearances, Index 309.1 Horizontal Clearances for Highways, (3)(a) Minimum Clearances, Table 302.1 specifies that the minimum continuous usable width of paved shoulders for 6 or more lane freeways shall be **10 feet** on each side.

  The existing I-280 southbound mainline adjacent to the project area provides a nonstandard horizontal clearance of approximately **2 feet** between the left edge of traveled way and the concrete barrier within the I-280 median. The existing I-280 northbound mainline adjacent to the project area provides a nonstandard horizontal clearance of approximately **9 feet** between the left edge of traveled way and the concrete barrier within the I-280 median. Additionally, the metal beam guardrails (shielding the Ocean Ave overcrossing column supports) that are situated along the right edge of shoulder in both the northbound and southbound directions result in nonstandard horizontal clearances of approximately **8 feet** from the right edge of traveled ways to the guardrails.

- **Nonstandard Lane Width** – Caltrans HDM, 7th edition (July 1, 2020, page 300-1), Topic 301 – Traveled Way Standards, Index 301.1 Lane Widths specifies that the minimum lane width on two-lane and multilane highways, ramps, collector-distributor roads, and other appurtenant roadways shall be **12 feet**.

  The existing I-280 southbound mainline adjacent to the project area provides nonstandard **11 feet** wide travel lanes.

- **Nonstandard Median Width** – Caltrans HDM, 7th edition (July 1, 2020, page 300-22), Topic 305 – Median Standards, Index 305.1 Width, (3)(a) Freeways and Expressways specifies that in areas where restrictive conditions prevail the minimum median width shall be **22 feet**.

  The existing I-280 mainline adjacent to the project area provides a nonstandard median width of approximately **13 feet**.

- **Nonstandard Vertical Clearance** – Caltrans HDM, 7th edition (July 1, 2020, page 300-36), Topic 309 – Clearances, Index 309.2 Vertical Clearances, (1)(a) Freeways and Expressways specifies that **16 feet 6 inches** shall be the minimum

vertical clearance over the roadbed of the State facility (e.g., main lanes, shoulders, ramps, collector-distributor roads, speed change lanes, etc.).

The existing I-280 northbound mainline provides a nonstandard vertical clearance of approximately **15 feet 4 inches** as the mainline crosses beneath the existing Ocean Avenue overcrossing structure.

Addressing these existing nonstandard design features would entail widening and realigning/straightening of the mainline facility, which would likely require reconstruction of the Ocean Avenue overcrossing structure and possibly lowering of the vertical profile of the mainline facility. These improvements are considerable and are beyond the purpose, need, and scope of the Ocean Avenue off-ramp realignment project.

The long lead times in acquiring the necessary right of way, environmental approvals, and funding required to ultimately design and construct these mainline improvements prior to or concurrent with the proposed Ocean Avenue off-ramp project would significantly delay implementation of the safety improvements intended for pedestrians, bicyclists and motorists traveling along Ocean Avenue. Implementation of the Ocean Avenue off-ramp project is not anticipated to degrade the safety of the existing mainline facility and or exacerbate the existing nonstandard design features that are to remain.

Traffic Data

Traffic data on I-280 mainline and ramps were obtained from the Caltrans Traffic Census Program information. The Annual Average Daily Traffic (AADT) can be found in Table 10.

Table 10
Annual Average Daily Traffic Data

Location	AADT
SB Ramps (2011 data)	
SB Off-Ramp to Geneva/Ocean Avenue	15,500
Secondary SB Off-Ramp to Ocean Avenue	7,600
Secondary SB Off-Ramp to Geneva Avenue	8,000
SB On-Ramp from Geneva Avenue	11,400
Mainline (2015 data)	
I-280 (SB and NB)	184,000
NB Ramps (2011 data)	
NB On-Ramp from Geneva/Ocean Avenue	15,500
NB Off-Ramp to Geneva Avenue	14,700

Notes:
AADT = Annual Average Daily Traffic, NB = northbound, SB = southbound

Traffic Analysis

A *Traffic Operational Analysis Report* (TOAR) was prepared by AECOM for the project and was accepted by Caltrans on August 7, 2017. The TOAR studied traffic conditions for Year 2020 and Year 2040 for the alternatives described in the following paragraphs. Delays incurred have lead to an estimated construction completion date in 2023, thus resulting in the project being based on estimated traffic volumes approximately 17 years after construction completion. However, it is not expected that the potential increases in traffic anticipated between Year 2040 and Year 2043 would have a significant impact on the conclusions specified in the TOAR, and an exception to 20-year design period policy per HDM Index 103.2 was granted by Caltrans on February 28, 2020.

Alternative 1 – No Build:

- No modifications to the existing I-280 ramp configuration.

Alternative 2 – Preferred (Proposed Project Improvements):

- Elimination of the existing free-right turn lane for vehicles exiting the SB I-280 off-ramp just prior to the Ocean Avenue/Howth Street intersection;
- Realignment and widening of the existing Ocean Avenue off-ramp to a two-lane T-intersection at Ocean Avenue; and
- Installation of a traffic signal at the realigned SB I-280 off-ramp/Ocean Avenue intersection.

The following traffic data and discussion have been summarized from the TOAR. Caltrans approved peak-period forecast demand volumes (July 8, 2016) used for the traffic operational analysis for future year conditions. Because there are no new site developments or attractions associated with the proposed project improvements, it was assumed that there was no change to demand volumes in or near the project location. For this reason, the forecast volume demand is the same for both No-Build and Build Alternatives. The intersection analysis was conducted based on the methodologies outlined in the Highway Capacity Manual (HCM 2000). The Level of Service (LOS) criteria used for this methodology are summarized in Table 11 for both signalized and un-signalized intersections.

Table 11
Level of Service Criteria

LOS	Delay (sec/veh)	
	Signalized	**Un-Signalized**
A	Less than or equal to 10	
B	> 10-20	> 10-15
C	> 20-35	> 15-25
D	> 35-55	> 25-35
E	> 55-80	> 35-50
F	> 80	> 50

Source: HCM 2000
Notes: LOS = Level of Service; sec/veh = seconds per vehicle

Synchro software was used to analyze the study intersections using HCM 2000 methodology. LOS is an indicator of operating conditions on a roadway or at an intersection and is defined in categories ranging from A to F. These categories can be viewed much like school grades, with A representing the best traffic flow conditions and F representing poor conditions.

LOS A indicates free-flowing traffic and LOS F indicates substantial congestion with stop-and-go traffic and long delays at intersections. In urban areas, because intersections are spaced relatively close together, intersection capacities generally control traffic operations on the arterials. Therefore, the LOS at signalized intersections gives a good indication of the general operating conditions throughout the transportation network.

There are no proposed improvements to the SB off-ramp where the ramp diverges from the I-280 mainline. Based on criteria defined in HCM 2000, the ramp termini at the I-280 SB off-ramp does not warrant merge and/or diverge analysis. As a result, a merge/diverge analysis was not conducted for the I-280 SB off-ramp realignment project.

Although a merge/diverge analysis is not warranted for the SB Ocean Avenue off-ramp diverge from the I-280 mainline, it has been reported that the traffic operations at this location often result in queueing of vehicular traffic beyond the ramp gore onto the I-280 mainline during peak hours.

To demonstrate that the proposed improvement will not change or degrade the existing traffic queue condition, a queue analysis of this area was performed based on the existing and future conditions with improvements. For example, if the existing condition ramp operations show 10 vehicles queuing beyond the gore area, the future condition with project improvements should not result in more than 10 vehicles queuing.

Synchro Plus, comprising Synchro and Sim-Traffic, is a complete software package for modeling, optimizing, managing, and simulating traffic systems. This software was used to evaluate the existing traffic operation and queueing conditions at the study intersections. The Synchro and Sim-Traffic operational models are calibrated based on field observations and data collected as part of this project.

The intersection LOSs and delay results for the Opening Year (2020) No-Build conditions are presented in Table 12, and the intersection Sim-Traffic queue lengths are summarized in Table 13.For the Opening Year (2020) No-Build condition, all of the study intersections operated at a LOS D or better during both AM and PM peak hours.

The queues on the I-280 SB Off-Ramp at Ocean Avenue extended beyond the 700 feet of existing storage (up to the off-ramp split to Geneva Avenue). At times during the 1-hour sim-traffic simulation, the model showed the queue length extending to the gore point at the mainline and blocking the vehicles exiting to the SB Geneva Off-Ramp.

Table 12
Opening Year 2020 No-Build Intersection Level of Service Summary

No.	Intersection Name	Control	Opening Year 2020 No-Build			
			AM Peak		PM Peak	
			LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
1	Ocean Avenue/Phelan Avenue	Signal	C (B)	25.5 (16.3)	C (B)	20.9 (15.1)
	Ocean Avenue/Geneva Avenue	Signal	B (C)	18.2 (26.7)	B (B)	19.7 (18.7)
2	Ocean Avenue /Howth Street	Signal	C (C)	33.1 (24.8)	C (C)	24.0 (25.0)
3	Ocean Avenue /I-280 SB Off-Ramp	Free/Yield	N/A	N/A	N/A	N/A
4	Ocean Avenue /I-280 NB On-Ramp	Signal	D	48.8	C	21.6
5	Geneva Avenue /Howth Street	Signal	A	0.3	A	0.6
6	Geneva Avenue /I-280 SB Off-Ramp	Signal	C	24.7	C	27.9

Notes:

LOS calculations are based on HCM 2000.

LOS in parentheses indicates Sim-Traffic Analysis Results.

I-280 = Interstate 280
LOS = Level of Service
NB = northbound
SB = southbound
sec/veh = seconds per vehicle

Table 13
Opening Year (2020) No-Build Intersection Queue Length Summary

No.	Intersection	Queue Length (Feet)									
1	Geneva Avenue /Phelan Avenue and Ocean Avenue	Movement	EBL	EBT	EBTR	WBT	WBT	WBTR	SBLT	SBT	SBR
		Storage Capacity	170	430	430	125	125	125	160	160	160
		AM Peak	170	295	335	125	125	125	125	115	65
		PM Peak	135	280	335	125	125	125	135	135	75
	Geneva Avenue and Ocean Avenue	Movement	EBT	EBT	WBT	WBT	NBL	NBLR			
		Storage Capacity	125	125	500	500	490	490			
		AM Peak	105	110	500	500	490	225			
		PM Peak	100	110	500	500	350	380			
2	Howth Street and Ocean Avenue	Movement	EBT	WBT	WBTR	NBLTR	SBLTR				
		Storage Capacity	500	650	160*	260	200				
		AM Peak	500	390	160	165	115				
		PM Peak	500	400	160	90	155				
3	Ocean Avenue and I-280 SB Off-Ramp	Movement	Ocean Avenue Off -Ramp								
		Storage Capacity	1,300 to freeway (650 to Geneva Avenue off-ramp split)								
		AM Peak	1,135								
		PM Peak	1,145								
4	Ocean Avenue and I-280 NB On-Ramp	Movement	EBL	EBT	WBTR						
		Storage Capacity	600	600	620						
		AM Peak	350	170	300						
		PM Peak	275	205	285						

Notes:

* Storage distance between the intersection of Ocean Avenue/Howth Street and I-280 SB off-ramp.

Queue lengths are expressed in feet.

Queue results are based on ten multiple runs.

EBL = eastbound left
EBT = eastbound through
EBTR = eastbound through/right
I-280 = Interstate 280
NB = northbound
NBL = northbound left
NBLR = northbound shared left/right
NBLTR = northbound shared left/through/right
SBLT = southbound left/through
SBLTR = southbound shared left/through/right
SBR =southbound right
SBT = southbound through
WBT = westbound through
WBTR = westbound through/right

The summary of intersection LOS for the Opening Year (2020) Build conditions is presented in Table 14. The results for the No-Build conditions are included for comparison purposes.

Table 14
Opening Year (2020) Build Intersection Level of Service Summary

No.	Intersection Name	Opening Year 2020 No-Build				Opening Year 2020 Build			
		AM Peak		PM Peak		AM Peak		PM Peak	
		LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
1	Ocean Avenue /Phelan Avenue	C (B)	25.5 (16.3)	C (B)	20.9 (15.1)	C (B)	22.9 (16.2)	B (B)	19.8 (14.9)
	Ocean Avenue /Geneva Avenue	B (C)	18.2 (26.7)	B (B)	19.7 (18.7)	B (C)	18.6 (25.7)	B (C)	17.6 (21.1)
2	Ocean Avenue /Howth Street	C (C)	33.1 (24.8)	C (C)	24.0 (25.0)	B (C)	18.7 (20.3)	B (A)	12.0 (9.7)
3	Ocean Avenue /I-280 SB Off-Ramp	N/A	N/A	N/A	N/A	A (B)	5.2 (10.7)	A (A)	5.6 (3.4)
4	Ocean Avenue /I-280 NB On-Ramp	D	48.8	C	21.6	D	48.8	C	21.6
5	Geneva Avenue /Howth Street	A	0.3	A	0.6	A	0.3	A	0.6
6	Geneva Avenue /I-280 SB Off-Ramp	C	24.7	C	27.9	C	25.8	C	27.1

Notes:

LOS calculations are based on HCM 2000.

LOS in parentheses indicates Sim-Traffic Analysis Results.

I-280 = Interstate 280
LOS = Level of Service
NB = northbound
SB = southbound
sec/veh = seconds per vehicle

For the Opening Year (2020) Build conditions analysis, the proposed intersection at I-280 SB Off-Ramp/Ocean Avenue is signalized and coordinated with all of the study intersection signals along Ocean Avenue. In the existing and No-Build conditions, the intersections along the Ocean Avenue are operating at an 80-second cycle length. This 80-second cycle length was modeled for the Build condition, and there was no observed improvement in the LOS of the intersections or the queue length of the I-280 SB off-ramp.

Therefore, to improve future traffic operational conditions, an optimized 90-second cycle length was used at all of the study intersections along Ocean Avenue, with the exception of the I-280 SB Off-Ramp/Ocean Avenue intersection. The intersection at

Ocean Avenue and the I-280 SB Off-Ramp would operate at a half-cycle length of 45 seconds to provide better operational conditions of the ramp, allowing for a quick clearance of the ramp queue.

This intersection showed acceptable LOS results when analyzed using a 90-second cycle length, but the queue lengths were significantly decreased when the cycle length was reduced to 45 seconds. With the proposed optimum cycle lengths, all of the intersections along Ocean Avenue would operate at LOS C or better during the AM and PM peak hours.

For the Future Year (2040) operational analysis, the approved 2040 traffic volumes were used for the Synchro/Sim-Traffic analysis for both the No-Build and Build Alternatives.Based on the Synchro/Sim-Traffic traffic analysis results, all intersections would operate at LOS D or better during both the peak hours.

The queue lengths on the I-280 SB Off-Ramp at Ocean Avenue increases for the Future Year (2040) conditions compared to the Opening Year (2020) operating conditions. The queue lengths on the I-280 SB Off-Ramp at Ocean Avenue extend beyond the 700 feet of existing storage (up to the off-ramp split to Geneva Avenue) by approximately 490 feet during the AM peak hour and by approximately 455 feet during the PM peak hour. Similar to the results from the Opening Year, the model showed the queue length extending to the gore point at the mainline and blocking the vehicles exiting to the SB Geneva Off-Ramp.

All signals along Ocean Avenue are coordinated. The existing and Future (2040) No-Build conditions use an 80-second cycle length, and the Future (2040) Build condition uses an optimized 90-second cycle length at all locations except the proposed intersection at Ocean Avenue and I-280 SB Off-Ramp. Similar to the Opening Year (2020), a half-cycle of 45 seconds was used at the proposed intersection to reduce the queue length on the ramp.

Table 15 presents the summary of the sim-traffic queues at the study intersections under the Opening Year (2020) Build conditions.

Table 15
Opening Year (2020) Build Intersection Queue Length Summary

No.	Intersection	Queue Length (Feet)									
1	Geneva Avenue /Phelan Avenue and Ocean Avenue	Movement	EBL	EBT	EBTR	WBT	WBT	WBTR	SBLT	SBT	SBR
		Storage Capacity	170	430	430	125	125	125	160	160	160
		AM Peak	170	305	330	125	125	125	145	130	55
		PM Peak	160	235	330	125	125	125	130	145	90
	Geneva Avenue and Ocean Avenue	Movement	EBT		EBT		WBT		WBT	NBL	NBLR
		Storage Capacity	125		125		500		500	490	490
		AM Peak	115		110		500		500	490	490
		PM Peak	95		90		500		500	430	440
2	Howth Street and Ocean Avenue	Movement	EBT		WBT		WBTR		NBLTR	SBLTR	
		Storage Capacity	500		300		300		260	200	
		AM Peak	500		300		300		160	110	
		PM Peak	325		300		265		90	200	
3	Ocean Avenue and I-280 SB Off-Ramp	Movement	EBT		WBT		SBR1		SBR2		
		Storage Capacity	-		300		600		350		
		AM Peak	-		300		340		315		
		PM Peak	-		210		210		190		
4	Ocean Avenue and I-280 NB On-Ramp	Movement	EBL		EBT		WBTR				
		Storage Capacity	600		600		620				
		AM Peak	440		335		425				
		PM Peak	380		315		190				

Notes

Queue lengths are expressed in feet.
Queue results are based on 10 multiple runs.
EBL = eastbound left; EBT = eastbound through;
EBTR = eastbound through/right
I-280 = Interstate 280
NB = northbound
NBL = northbound left
NBLR = northbound shared left/right
NBLTR = northbound shared left/through/right
SBLT = southbound left/through
SBLTR = southbound shared left/through/right
SBR =southbound right
SBT = southbound through
WBT = westbound through
WBTR = westbound through/right

The intersection LOS results for the Future Year (2040) No-Build conditions are presented in Table 16 and the intersection Sim-Traffic queue lengths are summarized in Table 17.

Table 16
Future Year (2040) No-Build Intersection Level of Service Summary

No.	Intersection Name	Control	Design Year 2040 No-Build Conditions			
			AM Peak		PM Peak	
			LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
1	Ocean Avenue /Phelan Avenue	Signal	C (C)	31.7 (25.7)	D (B)	35.0 (19.4)
	Ocean Avenue /Geneva Avenue	Signal	B (C)	19.6 (30.9)	C (C)	26.0 (20.9)
2	Ocean Avenue /Howth Street	Signal	D (C)	47.6 (28.4)	C (D)	28.2 (36.2)
3	Ocean Avenue /I-280 SB Off-Ramp	Free/Yield	N/A	N/A	N/A	N/A
4	Ocean Avenue /I-280 NB On-Ramp	Signal	D	53.5	C	24.1
5	Geneva Avenue /Howth Street	Signal	A	0.5	A	0.9
6	Geneva Avenue /I-280 SB Off-Ramp	Signal	C	31.6	C	30.7

Notes: LOS calculations are based on HCM 2000.

LOS in parentheses indicates Sim-Traffic Analysis Results.

I-280 = Interstate 280
LOS = Level of Service
NB = northbound
SB = southbound
sec/veh = seconds per vehicle

Table 17
Design Year 2040 No-Build Intersection Queue Length Summary

No.	Intersection	Queue Length (Feet)									
1	Geneva Avenue /Phelan Avenue and Ocean Avenue	Movement	EBL	EBT	EBTR	WBT	WBT	WBTR	SBLT	SBT	SBR
		Storage Capacity	170	430	430	125	125	125	160	160	160
		AM Peak	170	305	330	125	125	125	145	130	55
		PM Peak	160	235	330	125	125	125	130	145	90
	Geneva Avenue and Ocean Avenue	Movement	EBT	EBT	WBT	WBT	NBL	NBLR			
		Storage Capacity	125	125	500	500	490	490			
		AM Peak	125	125	500	500	490	490			
		PM Peak	125	125	500	500	490	490			
2	Howth Street and Ocean Avenue	Movement	EBT	WBT	WBTR	NBLTR	SBLTR				
		Storage Capacity	500	650	160*	260	200				
		AM Peak	500	400	465	210	170				
		PM Peak	500	465	445	165	200				
3	Ocean Avenue and I-280 SB Off- Ramp	Movement	EBT	WBT	SBR1	SBR2					
		Storage Capacity	1,300 to freeway (650 to Geneva Avenue off-ramp split)								
		AM Peak	1,190								
		PM Peak	1,155								
4	Ocean Avenue and I-280 NB On-Ramp	Movement	EBL	EBT	WBTR						
		Storage Capacity	600	600	620						
		AM Peak	375	255	290						
		PM Peak	285	320	315						

Notes:

* Storage distance between the intersection of Ocean Avenue/Howth Street and I-280 SB off-ramp.

Queue lengths are expressed in feet.

Queue results are based on ten multiple runs.

EBL = eastbound left
EBT = eastbound through
EBTR = eastbound through/right
I-280 = Interstate 280
NB = northbound
NBL = northbound left
NBLR = northbound shared left/right
NBLTR = northbound shared left/through/right
SBLT = southbound left/through
SBLTR = southbound shared left/through/right
SBR =southbound right
SBT = southbound through
WBT = westbound through
WBTR = westbound through/right

The summary of intersection LOS for Future Year (2040) Build conditions is presented in Table 18. The results for the No-Build conditions are included in the table for comparison purposes.

Table 18
Design Year 2040 Build Intersection Level of Service Summary

No.	Intersection Name	Opening Year 2040 No-Build				Opening Year 2040 Build			
		AM Peak		PM Peak		AM Peak		PM Peak	
		LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
1	Ocean Avenue /Phelan Avenue	C (C)	31.7 (25.7)	D (B)	35.0 (19.4)	C (C)	24.2 (30.2)	C (B)	24.4 (17.6)
	Ocean Avenue /Geneva Avenue	B (C)	19.6 (30.9)	C (C)	26.0 (20.9)	C (C)	20.1 (25.0)	B (C)	18.5 (21.0)
2	Ocean Avenue /Howth Street	D (C)	47.6 (28.4)	C (D)	28.2 (36.2)	C (C)	26.1 (26.0)	B (C)	15.8 (31.1)
3	Ocean Avenue /I-280 SB Off-Ramp	N/A	N/A	N/A	N/A	A (B)	4.9 (12.4)	A (B)	5.8 (18.6)
4	Ocean Avenue /I-280 NB On-Ramp	D	53.5	C	24.1	D	53.6	C	24.1
5	Geneva Avenue /Howth Street	A	0.5	A	0.9	A	0.5	A	0.9
6	Geneva Avenue /I-280 SB Off-Ramp	C	31.6	C	30.7	C	31.6	C	31.3

Notes:

LOS calculations are based on HCM 2000.

LOS in parentheses indicates Sim-Traffic Analysis Results.

I-280 = Interstate 280
LOS = Level of Service
NB = northbound
SB = southbound
sec/veh = seconds per vehicle

Table 19 presents the summary of the queues at the study intersections under the Build conditions for the Future Year (2040).

Table 19
Future Year (2040) Build Intersection Queue Length Summary

No.	Intersection	Queue Length (Feet)									
1	Geneva Avenue /Phelan Avenue and Ocean Avenue	Movement	EBL	EBT	EBTR	WBT	WBT	WBTR	SBLT	SBT	SBR
		Storage Capacity	170	430	430	125	125	125	160	160	160
		AM Peak	170	430	430	125	125	125	160	160	75
		PM Peak	170	245	325	125	125	125	160	160	90
	Geneva Avenue and Ocean Avenue	Movement	EBT	EBT	WBT	WBT	NBL	NBLR			
		Storage Capacity	125	125	500	500	490	490			
		AM Peak	125	125	500	500	490	490			
		PM Peak	105	115	500	500	490	490			
2	Howth Street and Ocean Avenue	Movement	EBT	WBT	WBTR	NBLTR	SBLTR				
		Storage Capacity	500	300	300	260	200				
		AM Peak	500	300	300	245	140				
		PM Peak	360	300	300	205	200				
3	Ocean Avenue and I-280 SB Off-Ramp	Movement	EBT	WBT	SBR1	SBR2					
		Storage Capacity	-	300	600	350					
		AM Peak	-	300	525	350					
		PM Peak	-	300	405	350					
4	Ocean Avenue and I-280 NB On-Ramp	Movement	EBL	EBT	WBTR						
		Storage Capacity	600	600	620						
		AM Peak	340	190	425						
		PM Peak	555	600	415						

Notes

Queue lengths are expressed in feet.
Queue results are based on 10 multiple runs.

EBL = eastbound left; EBT = eastbound through; EBTR = eastbound through/right
I-280 = Interstate 280
NB = northbound; NBL = northbound left; NBLR = northbound shared left/right
NBLTR = northbound shared left/through/right
SBLT = southbound left/through
SBLTR = southbound shared left/through/right
SBR =southbound right
SBT = southbound through
WBT = westbound through
WBTR = westbound through/right

Traffic Analysis Summary

Based on the traffic analysis, it can be concluded that during the peak hours and under the No-Build conditions, the I-280 SB Off-Ramp at Ocean Avenue is heavily congested; the queues extend beyond the existing Ocean Avenue Off-Ramp storage length and block the traffic heading to Geneva Avenue. Every so often, the ramp queues spill back to the freeway mainline.

The proposed realignment of the I-280 SB Off-Ramp to Ocean Avenue and the proposed signalization at Ocean Avenue will improve the pedestrian and bicycle safety and operations, will control movements at the intersection, and provide additional storage capacity on the ramp.

The traffic operational analysis results for Opening Year (2020) and Future Year (2040) conditions show that all study intersections would operate at an acceptable LOS (D or better). However, under the No-Build condition, the I-280 SB Off-Ramp operations would worsen from existing conditions; queues would extend back to the mainline, blocking the vehicles traveling to Geneva Avenue. The proposed off-ramp realignment, including additional storage capacity and signalization, would reduce the off-ramp queue. Table 20 provides a summary of the queue length on the I-280 SB Off-Ramp with and without the proposed improvements for the Opening Year (2020) and the Future Year (2040) conditions.

Table 20
Queue Length Summary for I-280 SB Off-Ramp

Peak Hour	Opening Year 2020				Design Year 2040			
	No-Build		Build		No-Build		Build	
	Available Storage* (feet)	Queue Length (feet)	Available Storage** (feet)	Queue Length (feet)	Available Storage* (feet)	Queue Length (feet)	Available Storage** (feet)	Queue Length (feet)
AM Peak	1,300	1,135	1,565	655	1,300	1,190	1,565	875
PM Peak	1,300	1,145	1,565	400	1,300	1,155	1,565	755

Notes:

* Sum of available storage between I-280 mainline and Geneva Avenue ramp split (650 feet) and available storage between Geneva Avenue ramp split and Ocean Avenue (650 feet).

** Sum of available storage between I-280 mainline and Geneva Avenue ramp split (600 feet) and available storage between Geneva Avenue ramp split and Ocean Avenue (600-foot right-turn lane and 365-foot right-turn pocket).

Collision Analysis

Collision data for the I-280 mainline and southbound off-ramps was obtained from the Caltrans Traffic Accident Surveillance and Analysis System (TASAS) reports. Collision data for the most recent 3-year time period is summarized in Table 21. The total actual accident rate for mainline traffic on I-280 southbound adjacent to the Project Area is 0.45 accidents per million vehicle miles ("MVM") as compared to the statewide average of 0.89 accidents per MVM. The total actual accident rate for traffic on the southbound off-ramp to westbound Ocean Avenue is 0.00 accidents per million vehicles ("MV") as compared to the statewide average of 0.92 accidents per MV. And the total actual accident rate for traffic on the southbound off-ramp to westbound Ocean/ Geneva Ave is 0.24 accidents per MV as compared to the statewide average of 0.28 accidents per MV.

Table 21
I-280 Mainline and Ramp Collision Summary from
Caltrans TASAS Reports Table B (October 1, 2016 to September 30, 2019)

Post Mile	Location	Number of Accidents			Actual Accident Rate[1] (MV[+] or MVM)			Statewide Average Accident Rate[1] (MV[+] or MVM)		
		Total	Fatal	F+I	Total	Fatal	F+I	Total	Fatal	F+I
Mainline										
R01.760-R01.971	I-280 NB	7	0	2	0.35	0.000	0.10	0.89	0.003	0.28
R01.760-R01.971	I-280 SB	9	0	4	0.45	0.000	0.20	0.89	0.003	0.28
Ramps										
R1.833	I-280 SB Off-Ramp to WB Ocean Avenue	0	0	0	0.00	0.000	0.00	0.92	0.005	0.32
R1.945	I-280 SB Off-Ramp to Ocean/ Geneva Avenue	4	0	3	0.24	0.000	**0.18**	0.28	0.002	0.09

Notes:
[1] Accident rates expressed as number of accidents per MVM.
[+] MV rather than MVM used in accident rates for ramps.
F+I = fatal plus injury, SB = southbound, WB = westbound
MV = million vehicles, MVM = million vehicles miles

According to the Caltrans TASAS information for the most recent 3-year time period, there were zero accidents on the southbound off-ramp to Ocean Ave and four accidents on the southbound off-ramp to Ocean/Geneva Avenue, of which three accidents involved injury. The total accident rates on these off-ramps are relatively low and the proposed project is intended to improve safety.

Widening and realignment of the Ocean Avenue off-ramp, as well as implementation of the signalized intersection (and elimination of merging vehicles) at Ocean Avenue, will provide additional storage capacity along the off-ramp and is expected to reduce the queue length on the off-ramp which should improve the accident rate in this area. The proposed nonstandard features are not expected to worsen the condition.

Intersection Control Evaluation

An Intersection Control Evaluation (ICE) Memorandum, dated March 28, 2018 was prepared by AECOM for the project and was accepted by Caltrans. The ICE considered potential intersection configurations and determined that a signalized intersection is the only viable and practical design alternative for the intersection at I-280 SB off-ramp at Ocean Avenue. See Attachment I, Intersection Control Evaluation Memorandum, for details.

Interim Features

Interim improvements are not proposed for the Preferred Alternative.

High-Occupancy Vehicle (Bus and Carpool) Lanes

High-occupancy vehicle lanes are not proposed for the Preferred Alternative.

Ramp Metering

Ramp metering is not proposed for the Preferred Alternative.

California Highway Patrol Enforcement Areas

California Highway Patrol enforcement areas are not anticipated to be affected or necessary for the Preferred Alternative.

Park-and-Ride Facilities

Park-and Ride facilities are not proposed for the Preferred Alternative.

Highway Planting

Currently, the project site is characterized by vegetated roadside slopes that transitions to a shallower slope as the ramp terminates at Ocean Avenue. The proposed retaining wall would cut into the slope to accommodate an additional travel

lane in the off-ramp. The existing sloped areas of the project corridor suffer erosion and vegetation loss; the proposed retaining wall will help manage these issues while maintaining the vegetated slope above the wall. At the intersection of the proposed off-ramp and Ocean Avenue, a group of cypress trees will be removed to realign the ramp; provide sufficient sight-distance for vehicle and pedestrian traffic; and correct root intrusion problems caused by the cypress, which is heaving the sidewalk.

Replacement highway planting will be provided in all areas of highway planting removal where right of way allows. Existing irrigation systems will be modified to support the replacement planting and a one-year plant establishment period will be included in the project. Where replacement planting is not possible at the removal location, replacement will be provided in adjacent planting areas along the project corridor. All planting will be in accordance with Caltrans' Replacement Highway Planting Policy.

Erosion Control

Temporary erosion control will be applied to the disturbed areas during the construction phase of the project. The use of permanent erosion control measures in the median will be evaluated during the design phase.

In addition to the temporary erosion control applied to disturbed areas, other erosion control measures will be evaluated during the design phase including:

- temporary silt fences;
- temporary drainage inlet protection;
- temporary covers on slopes and stockpiles;
- temporary concrete washout facilities;
- temporary construction site entrances in the median; and
- fiber rolls.

Noise Barriers

The closest noise-sensitive land uses are CCSF (directly west of the project area) and Balboa Park (directly east of the project area). Existing ambient noise levels in the project area are relatively high due to the proximity of I-280.

The operation of heavy equipment during the construction phase of the project may result in temporary increases in noise levels. However, this increase would be minimal and short term, lasting only for the duration of the construction phase. Construction activities would comply with all City and Caltrans regulations adopted to minimize construction-related noise impacts.

Once constructed, the project would not result in addition of any new through-traffic lanes in the project area. In addition, the project would not result in a substantial

horizontal change in the location of noise-generating vehicles relative to existing sensitive receptors. Therefore, there would be no substantial operational change in traffic-generated noise in the project area, and no impact would result. No provisions for noise barriers, berms, or other noise-reduction features are anticipated for this project.

Non-motorized and Pedestrian Features

The purpose of this project is to enhance pedestrian and vehicle safety by eliminating the existing free-right turn of traffic from the SB I-280 Off-Ramp onto Ocean Avenue.

Pavement Structural Section

Utilizing intersection peak hour demands derived from traffic count data obtained by the project, the following ADTs, ESALs, and TIs listed in Table 22 were calculated.

Table 22
SB I-280 Off-Ramp and Ocean Ave ADTs, ESALs, and TIs

Roadway Segment	ADT (2020)	ADT (2040)	ADT (2060)	DHV	D	$ESAL_{20}$	TI_{20}	$ESAL_{40}$	TI_{40}
Ocean Ave (west of SB Off Ramp)	36,934	41,531	46,700	2,305	0.54	4,306,307	10.5	4,840,631	11.0
Ocean Ave (east of SB Off Ramp)	25,445	28,875	32,768	1,480	0.78	4,353,439	10.5	4,943,433	11.0
SB Off-Ramp to Ocean Ave	11,627	12,789	14,068	825	1.00	2,503,004	10.0	2,753,304	10.0
						-	10.0*	-	11.0*

Notes:

1. All TI values are calculated; * denotes minimum TI for ramps, from Table 613.5A of Highway Design Manual.
2. ADT's derived from Intersection peak hour demands.
3. Directional distribution along Ocean Avenue is based on the ADTs from SF CHAMP Model.
4. Directional distribution along SB Off-Ramp to Ocean Avenue is 1, as the off-ramp is one way.
5. A truck percentage of 5% was utilized based on truck counts taken along off-ramp in 2015.
6. Truck classification % (2-axle, 3-axle, 4-axle, 5-axel) taken from Caltrans Census Data for I-280 PM: R0.738.

A Preliminary Structural Pavement Design memo was prepared for the SB I-280 Off-Ramp onto Ocean Avenue. Utilizing a TI_{20} value of 10 and assuming a preliminary R-value of 15, a preliminary 20-year flexible pavement structural section was developed for the SB I-280 Off-Ramp to Ocean Avenue.

Table 23
SB I-280 Off-Ramp to Ocean Ave – 20-year Flexible Pavement

Section Component	Thickness (feet)	Gravel Equivalent (feet)
RHMA-G	0.15	0.90
HMA	0.35	
Class 2 AB	0.85	0.94
Class 4 AS	0.90	0.90
Total	2.25	2.74

During the final design phase, subsurface soil conditions will be investigated to determine the actual site specific R-value to be used in the final pavement structural section design, and a Life Cycle Cost Analysis will be completed to evaluate the 20-year flexible, 40-year flexible, and 40-year rigid (JPCP) pavement structural section alternatives.

Needed Roadway Rehabilitation and Upgrading

The off-ramp to westbound Ocean Avenue will be reconstructed within the project limits of the Preferred Alternative. Rehabilitation of the off-ramp roadway pavement section is not proposed as part of the project, as the entire existing off-ramp to westbound Ocean Avenue will be removed and replaced. The scope of this project did not include pavement evaluations of the adjacent I-280 mainline and other nearby ramps.

Needed Structure Rehabilitation and Upgrading

The proposed project will not undertake any structure rehabilitation or upgrades. The existing structures within the project limits include the Ocean Avenue Overcrossing, a 4-span, cast-in-place, concrete box girder structure constructed in 1964. The existing structures will not be replaced, widened, or modified in any way by the proposed project. A new retaining wall is proposed as part of the project, and an Advanced Planning Study was developed. Wall types using top-down construction and ground anchors are preferred for Retaining Wall 8 due to the existing embankment and adjacent structures. Either a ground anchor wall or a soldier pile wall with ground anchors at critical locations could be used. Both wall types are recommended for further investigation during the Type Selection phase.

Cost Estimates

The total estimated project cost is $21.05 million. The total estimated roadway cost is $7.73 million and the total estimated structures cost is $6.19 million. Total estimated right of way cost is $2.17 million and support cost is $4.96 million. See Attachment D for the breakdown of Cost Estimate.

Effect of Projects Funded by Others on State Highway

The proposed project does not affect the capacity or operating characteristics of the state highway.

7B. Rejected Alternatives

7B.1 No-Build Alternative

The No Build Alternative proposes no modifications to the existing I-280 configuration other than routine maintenance and rehabilitation and the currently planned and programmed projects in the area. This alternative was studied and is not proposed moving forward.

7B.2 Realignment to a T-Intersection Using Multi-Way Stop Control

The implementation of stop sign intersection control is not practical due to the high I-280 SB ramp volumes. According to the San Francisco Chained Activity Modeling Process, the AADT is forecast to be 56,917 vehicles entering the I-280 SB Off-Ramp/ Ocean Avenue intersection for the Opening Year (2020). This volume is larger than the suggested threshold of 25,000 in the *ICE Process Informational Guide* for an all-way stop. Although this option may improve the pedestrian and bicycle safety, the queues on the I-280 SB off-ramp are likely to extend to the I-280 mainline and would cause impacts to mainline operations and safety. For the reasons listed above, this potential solution concept is not viable and will be dropped from further consideration.

7B.3 Realignment to a T-Intersection Using Yield Control (Roundabout)

The roundabout alternative option is not feasible at this location due to right of way impacts, traffic operation, and light rail operation in the median. The roundabout design not only impacts the light rail operations in the median, it also introduces additional traffic movements that are not applicable to this intersection. Furthermore, the implementation of a roundabout would not improve pedestrian/bicycle safety. In addition to these drawbacks, this design would require additional right of way and property acquisition. For the reasons listed above, this potential solution concept is not viable and will be dropped from further consideration.

8. CONSIDERATIONS REQUIRING DISCUSSION

8A. Hazardous Waste

A hazardous waste Initial Site Assessment (ISA) was conducted for the proposed project, see attachment K Initial Site Assessment. The purpose of the ISA was to assess and identify the potential for the presence of hazardous materials/wastes or contamination at the project site, as well as any responsible or potentially responsible

parties associated with identified contamination. The ISA determined that potential conditions may affect the project area and will require further evaluation.

Once the areas of excavation and soil disturbance are known, a Preliminary Site Investigation (PSI) will be performed to evaluate hazardous materials concerns related to soil, groundwater, and construction materials in the proposed project area, as identified in the approved ISA. A work plan for the PSI will be submitted to Caltrans and SFDPH, the local regulatory oversight agency, for review and approval. The PSI will have to satisfy the requirements of the SFDPH Article 22A (also known as the Maher Ordinance). Additional investigation may be required to fully evaluate potential hazardous materials issues if concerns are identified during the PSI. The results of the environmental investigation(s) will be incorporated into the final design as appropriate, and provided to the contractor so the findings can be incorporated into their Health and Safety and Hazard Communication Programs. Implementation of the PSI and compliance with all recommendations included in the PSI would minimize exposure of workers and the general public to hazardous material of concern, and no impacts would result.

8B. Value Analysis

The National Highway Systems Act and by Safe Accountable Flexible Efficient Transportation Equity Act: A Legacy for Users require that a value analysis study be prepared for projects exceeding $50 million in total cost. Because the project cost does not exceed the $50 million threshold, a value analysis study is not proposed for this project.

8C. Resource Conservation

The energy impacts of transportation projects are typically divided into two areas: (1) the direct energy required for ongoing operations—in this case, the use of petroleum-based fuels and alternative fuels for motor vehicle travel in the project area; and (2) the indirect energy required to produce the materials for and to carry out construction of the project. In the long term, the direct, or operating, energy requirements are usually greater and of primary importance.

Although the purpose of the project is to improve safety, the proposed project will also improve traffic operations and facilitate traffic movements through the project area. The lessening of congestion and related traffic delay is associated with faster average travel speeds and more efficient vehicle operation compared to No-Build conditions. Improved operations are likely to reduce vehicle energy use, whether in the form of petroleum fuels or alternative sources of energy. For these reasons, the proposed project would be anticipated to have a beneficial or, at worst case, neutral effect on direct energy use.

No major facilities will be salvaged or relocated from this project. However, whenever possible, existing roadway items such as signs, light standards, guardrails, and other associated hardware will be relocated or stockpiled to be used at a later date. Removal of existing asphalt concrete pavement and concrete is anticipated to be negligible for this project.

8D. Right of Way

8D.1 General

A retaining wall utilizing ground anchors is proposed to extend approximately 3 feet outside of the State Right of way. The proposed retaining wall will require a simple fee acquisition with an approximate area on the order of 500 square feet from the adjacent property owner. Ground anchors are proposed to extend from the wall to approximately 20 feet outside of State right of way. The proposed ground anchors are completely underground and require an easement from the adjacent property owner to be constructed. Additionally, a temporary construction easement will be needed to facilitate construction of the ramp widening and retaining wall. The adjacent property owner is CCSF, which holds title to a single parcel. It is expected that the SFCTA will be able to obtain a simple fee acquisition, underground easement for the ground anchors, and temporary construction easement from CCSF at an approximate cost of $1.5 million.

A Right of Way Data Sheet has been prepared for the project. Estimated cost information is contained in the Right of Way Data Sheet in Attachment E of this report.

8D.2 Railroad

There is an SFMTA Muni LRV line running down the center of Ocean Avenue, near the southern limits of the proposed project. These tracks and their overhead contact system (OCS) are maintained and operated by the City of San Francisco (City). To facilitate construction of the proposed traffic signal, reconstruction and relocation of three Muni OCS poles will be necessary. These poles will be designed and constructed according to Muni/SFMTA standards. SFMTA will continue to be involved and provide oversight/concurrence throughout the design and construction process.

The Balboa BART station is located in close proximity to the project limits. Right of Way issues are not anticipated in coordination with BART.

The California Public Utilities Commission (CPUC) General Orders (GOs) shall be complied with where appropriate.

8D.3 Utilities

There are multiple existing utilities running along Ocean Avenue. During the plans, specification, and estimate (PS&E) phase, coordination will be necessary with significant project stakeholders, including:

- SFMTA;
- San Francisco Public Utilities Commission (SFPUC);
- San Francisco Public Works (SFPW);
- Pacific Gas and Electric Company (PG&E); and
- AT&T.

Overhead utility facilities in the immediate project vicinity include the SFMTA electrical for their OCS. Underground utility facilities include electric, lighting, gas, sanitary sewer, water, and communications. There are water, electric, and gas utility facilities on the existing Ocean Avenue OC.

Any needed utility connections will be coordinated with the affected utility companies during the PS&E design phase. Utility connection work could result in temporary lane closures. Emergency services access would be maintained throughout project construction. The project's Traffic Management Plan (TMP) will address temporary lane closures during construction.

There is an existing PG&E vault immediately adjacent to and partially encroaching into the State right of way. However, the access point to the vault is located within City right of way. It is anticipated that this vault will be relocated south into the Ocean Avenue intersection and outside the State right of way. To facilitate construction of the proposed traffic signal, reconstruction and relocation of three Muni OCS poles will be necessary. SFMTA will continue to be involved and provide oversight/concurrence throughout the design and construction process. No other utility access points are expected to encroach into the State right of way. However, if during the final design phase it is determined that utility access points can only be located within the State right of way, a Utility Encroachment Policy Variance Request memorandum will be required.

Verifications of utilities will be required. The need for positive location (potholing), as prescribed by the Project Development Procedures Manual, will be determined during the design phase.

8D.4 Relocation Impact Studies

Relocation is not required for the proposed project.

8D.5 Airspace Lease Areas

Airspace lease areas are not within the project limits.

8E. Environmental

SFCTA is the Lead Agency under the CEQA. The project is categorically exempt from CEQA pursuant to Section 15302 of the CEQA Guidelines. CEQA Guidelines, Section 15302, Replacement or Reconstruction, state:

> "Class 2 consists of replacement or reconstruction of existing structures and facilities where the new structure will be located on the same site as the structure replaced and will have substantially the same purpose and capacity as the structure replaced, including but not limited to:
>
> (c) Replacement or reconstruction of existing utility systems and/or facilities involving negligible or no expansion of capacity."

The project will not result in cumulative impacts; will not result in significant effects on the environment due to unusual circumstances; will not result in damage to scenic resources; is not located on a hazardous waste site which is included on any list compiled pursuant to Section 65962.5 of the Government Code; and will not cause a substantial adverse change in the significance of a historical resource.

See attachment J for the CEQA Categorical Exemption Document. This Project Study Report-Project Report (PSR-PR) has been prepared to complete the project approval process. Caltrans is the Lead Agency under the NEPA. NEPA approval will be obtained once the project is programmed.

8E.1 Water Quality

A Water Quality Assessment Report was prepared for the Project.[5] The Project is under the jurisdiction of the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB). The SFBRWQCB implements the San Francisco Bay Basin Water Quality Control Plan to regulate surface and groundwater quality in the region. The project area is mostly within Caltrans' right of way and is covered by Caltrans' Municipal Separate Sewer System (MS4) permit and Statewide Storm Water Management Plan. The project footprint is within the combined sewer system and would not disturb soils and/or add impervious areas during construction activities on Ocean Avenue. Therefore, the Phase II Small MS4 General permit and the San Francisco Stormwater Management Requirements and Design Guidelines do not apply. The project is not anticipated to impact jurisdictional waters and will not require a permit under Section 401 of the Clean Water Act (CWA) through the

[5] WRECO, 2018, *Interstate 280 Interchange Modifications at Balboa Park Project, Water Quality Assessment Report.* February.

SFBRWQCB, or a permit under Section 404 of the CWA, issued by the United States Army Corps of Engineers.

The project is in the South Bay Hydrologic Unit and the San Mateo Bayside Hydrologic Area. The project is in the Islais Creek watershed. Streams historically flowed east and discharged into the Islais Creek channel. Streams in the watershed have been superseded by sewer systems managed by SFPUC. Balboa Park is in the Islais Valley Groundwater Basin. According to the California Department of Water Resources Groundwater Bulletin 118, the basin has a surface area of 5,930 acres (9.2 square miles) and an average rainfall of 20 to 24 inches. Recharge sources include rainfall, irrigation, and pipe leakages. The whole soils K factor for the project area was determined to be 0.32. The area should not be susceptible to high runoff potential if the soils are not heavily disturbed. The Islais Valley Groundwater Basin has the following beneficial uses: municipal domestic water supply, industrial water supply, industrial process supply, and agricultural water supply. There are no regional water quality issues, impaired waters, or areas of special biological significance in the project area.

To comply with the conditions of the Caltrans NPDES Permit (NPDES number CAS000003) and to address the temporary water quality impacts during construction, all construction activities need to comply with Standard Specifications 13-2, "Water Pollution Control Program". These specifications address the preparation of the Water Pollution Control Program (WPCP) Document and the implementation of WPCP during construction.

The added impervious area will entail a minimal increase to hydromodification and stormwater pollution effects, because runoff from project activities will discharge into the combined sewer system and be treated before entering Islais Creek channel. Runoff will be treated at the SFPUC's Southeast Treatment Plant, approximately 4 miles from the project site, and then discharged into the Islais Creek channel and eventually San Francisco Bay. SFPUC is currently upgrading the Southeast Treatment Plant to improve its operation and treatment processes.

Pollution and runoff sources are not expected to change. Design pollution prevention best management practices (BMPs) for disturbed slopes include vegetated surfaces, benching/terracing, slope rounding, gradient reduction, and hard surfaces. Hydromodification and treatment BMPs are not required for this project.

Project cut-and-fill, grading, and excavation activities would have the potential to increase erosion and result in temporary water-quality impacts. The project would

incorporate soil stabilization, sediment control, tracking control, and waste management and materials pollution control BMPs, including but not limited to geotextiles/erosion control blankets, hydroseeding, fiber rolls, drainage inlet protection, construction exits, and concrete washout facilities.

A SWPPP will be required from the contractor and approved by the Caltrans Resident Engineer prior to the start of construction. The SWPPP includes all monitoring and sampling procedures and instructions, location map, forms, and checklists required by the Construction General Permit (CGP) (Order No. 2009-009-DWQ, as amended by 2010-0014-DWQ and 2012-0006-DWQ). It would identify BMPs to reduce water quality impacts during construction. The SWPPP would emphasize: 1) standard temporary erosion control measures to reduce sedimentation and turbidity of surface runoff from disturbed areas; 2) personnel training; 3) scheduling and implementation of BMPs; 4) identification of BMPs for nonstormwater discharge such as fuel spills; and 5) mitigation and monitoring throughout the construction period. Because it would disturb more than 1 acre of soil, the project is subject to the CGP and a risk assessment is required. Compliance with these measures and all applicable regulations and BMPs would minimize potential impacts to stormwater.

The project's overall design goal will be to avoid impacts to water resources to the maximum extent practicable, promote infiltration of stormwater runoff, and reduce erosion. By meeting these goals and incorporating applicable NPDES requirements, water quality impacts should be minimized.

8E.2 Biological Resources

A Natural Environment Study (Minimal Impact) (NES-MI) was prepared for the project in compliance with the Caltrans Standard Environmental Reference.[6] As part of the NES-MI, a biological study area (BSA) was established to encompass the project limits and immediately adjacent locations, with a buffer to cover any potential habitat for special-status species. In addition, the BSA was surveyed for botanical and wildlife resources.

In the BSA, most of the vegetation is limited to ornamental plantings or ruderal vegetation. Most of the adjacent lands are also developed, including the CCSF, which has a small grass lawn surrounded by ornamental plantings.

The NES-MI determined that there were no State or federal wetlands or waters and no special-status plant species in the BSA. However, the NES-MI determined that the American peregrine falcon (Federally Delisted and Fully Protected status in California) has the potential to nest in or near the BSA. Migratory birds also have the

[6] WRECO, 2017, *Interstate 280 Interchange Modifications at Balboa Park Project, Natural Environment Study (Minimal Impact).* October.

potential to nest in trees or structures in the BSA. In addition, tall trees, vegetation, and the Ocean Avenue overpass in the BSA could provide suitable roosting habitat for special-status bats, so the potential for the presence of bats in the BSA cannot be ruled out. Therefore, Avoidance and Minimization Measures (AMMs) will be implemented to prevent any potential impact to special-status species, roosting bats, and migratory birds, and to prevent the spread of invasive, nonnative plant species.

Tree impacts anticipated for the project include three Monterey cypress trees between the Ocean Avenue and Geneva Avenue off-ramps, adjacent to the WB lane of Ocean Avenue; and another Monterey cypress and two Monterey pine trees on the vegetated slope adjacent to the Ocean Avenue off-ramp. For tree impacts on City property, replacement requirements will be in accordance with the City Urban Forestry Ordinance Article 16 § 806.

Based on the foregoing, it has been determined that the project will have no effect on listed species, their habitats, or protected communities, provided that the required AMMs are followed. No adverse modification to any species critical habitat will occur as a result of project activities.

8E.3 Hydrology and Floodplain

A technical memorandum was prepared for the project, to document the existing floodplains and drainage systems in the project area and evaluate potential impacts from the project to the floodplain and drainage systems.[7] The memorandum determined that, because the project was outside the 100-year floodplain, the 100-year flood will not interrupt traffic and no fill will enter the floodplain as a result of the project. The memorandum also determined that there are no floodplains within the project limits, and therefore no impacts to natural and beneficial floodplain values would result. The project will not significantly increase flows or affect floodplain areas. Therefore, floodplain avoidance, minimization, or mitigation measures are not required for the project.

A Caltrans Stormwater Data Report was prepared for the project (see signed cover sheet in Attachment F.[8] According to the report, the existing drainage system within the project limits is composed of storm drains along the I-280 off-ramp and Ocean Avenue, as well as roadside asphalt concrete gutters. The project is exempt from implementing stormwater treatment measures, due to water flowing into the combined sewer system.

The project is historically in the South Bay Hydrologic Unit and the San Mateo Bayside Hydrologic Sub-area. The project is in the Islais Creek watershed. Streams historically flowed east and discharged into the Islais Creek channel. Streams in the

[7] WRECO, 2017. *Interstate 280 Southbound Ocean Avenue Off-Ramp Realignment Project at Balboa Park, Hydrology and Hydraulic Memorandum*. June 23.
[8] WRECO, 2017. *Long Form – Stormwater Data Report*. June.

watershed have been superseded by the sewer systems managed by the SFPUC. There are no streams within the project limits.

8E.4 Geology/Soils/Seismic/Topography

The project site is on the San Francisco peninsula in the Coast Ranges geomorphic province, with northwesterly trending ridges and valleys and localized hills such as Potrero Hill. Jurassic- to Cretaceous-aged Franciscan Complex bedrock (primarily deformed and fractured sedimentary and volcanic, with minor metamorphic, rocks) is overlain by Quaternary sedimentary deposits. The site lies in hilly terrain in a zone with Colma Formation, Pleistocene-age nearshore, and beach deposits consisting of consolidated, well-sorted, fine- to medium-grained sand; overly Franciscan Complex deposits consisting of pervasively sheared sandstone, shale and serpentinite; and northeast-dipping greywacke sandstone with minor shale. The main geologic hazards at the site are related to seismic shaking due to large earthquakes.

The San Francisco Bay Area is crossed by numerous active faults associated with the San Andreas Fault System, which forms the boundary between the North American and Pacific tectonic plates. The site is not crossed by any known active faults.[9] However, it is situated between the San Andreas and Hayward-Rogers Creek faults, two major, historically active faults.

Five test borings were advanced for the design of the Ocean Avenue OC by Caltrans in May 1961; three additional borings were drilled for the retaining wall along the alignment line labeled "OF," generally along Bent 2, in December 1961. The rotary wash borings generally encountered medium dense sands and gravels to elevations ranging from 210 to 225 feet National Geodetic Vertical Datum of 1929 (NGVD 29) (212.8 to 227.8 feet, North American Vertical Datum of 1988 [NAVD 88]); the upper 7 feet of soil in Boring B-2 for the retaining wall is described as compact crushed rock with silty sand fill, and the upper 7 feet of soil in Boring B-3 for the OC is described as loose. Very dense sand was encountered beneath the surficial sands to approximately Elevation 218 feet to below Elevation 174 feet NGVD 29 (220.8 to 176.8 feet NAVD 88). Franciscan bedrock was encountered as shallow as Elevation 218 feet NGVD 29 (220.8 feet NAVD 88). No groundwater was encountered in the 1961 borings. Groundwater is estimated to be within 10 to 30 feet of the ground surface in this area, based on historically high groundwater contours.[10]

[9] California Geologic Survey, 2007.
[10] California Geologic Survey, 2000. Seismic Hazard Zone Report for the City and County of San Francisco, California; California Division of Mines and Geology, Seismic Hazard Zone Report 043.

8E.5 Cultural Resources

A Historic Property Survey Report was prepared for the project in compliance with the federal Section 106 process.[11] There are no prehistoric sites in the project Area of Potential Effects (APE), but the Auxiliary Water Supply System (AWSS) is a historic-era built environment resource in the APE. Because the AWSS is outside the subsurface vertical depth of the APE, it would not be affected by the project. The AWSS will be protected through the establishment of Environmentally Sensitive Areas (ESAs). To ensure no ground disturbance would with in the vicinity of the AWSS, the contractor will be required to adhere to minimization measures (i.e., following ESA Action Plan, ESA monitoring, and ESA training for the contractors). There will be no impacts to cultural resources in the vicinity of the project.

8E.6 Paleontological Resources

A Paleontological Identification Report was prepared by AECOM to evaluate the likelihood of encountering paleontological resources in the project area.[12] A paleontological records search with the University of California Museum of Paleontology indicated that no paleontological resources have been previously been recorded in the project site. However, the Pleistocene Colma Formation has the potential to contain paleontological resources. Based on a literature review, it is believed that Artificial Fill and Pleistocene Colma Formation contact may be within 25 feet below ground surface, and therefore paleontological resources may be encountered during grading operations. As a minimization measure, AECOM recommends to determine the contact depth between Artificial Fill and Pleistocene Colma Formation prior to grading and excavating for the retaining wall, which would extend as deep as 25 feet below ground surface. If the Pleistocene Colma Formation is at depths less than the expected excavation depth below ground surface, following Caltrans guidelines, a Paleontology Mitigation Plan would be prepared.

8E.7 Visual Impacts

A Visual Impact Assessment was prepared for the Project.[13] The segment of I-280 in the project area is not recognized as a scenic corridor, nor is it an officially designated scenic highway. Therefore, the project would not result in impacts to a designated scenic resource.

The visual character of the proposed project will be compatible with the existing visual character of the corridor. The addition of the proposed retaining wall will be

[11] AECOM, 2017. *Draft Historic Property Survey Report for the I-280 Southbound Ocean Avenue Off-Ramp Realignment Project At Balboa Park*. May.
[12] AECOM, 2017, *I-280 Southbound Ocean Avenue Off-Ramp Realignment Project at Balboa Park, Paleontological Identification Report/ Paleontological Evaluation Report.* July 11th.
[13] AECOM, 2017, *I-280 SB Ocean Avenue Off-Ramp Realignment Project, Visual Impact Assessment.* September 7th.

consistent with the overall visual character of I-280 which traverses significant topographic features and regularly features retaining walls of a similar length, height, and character as is proposed.

Currently, the project site is characterized by vegetated roadside slopes that transitions to a shallower slope as the ramp terminates at Ocean Avenue. The proposed retaining wall would cut into the slope to accommodate an additional travel lane in the off-ramp. The existing sloped areas of the project corridor suffer erosion and vegetation loss, and the proposed retaining wall would help manage these issues while maintaining the vegetated slope above the wall. At the intersection of the proposed off-ramp and Ocean Avenue, a group of cypress trees will be removed to realign the ramp; provide sufficient sight-distance for vehicle and pedestrian traffic; and correct root intrusion problems caused by the cypress, which is heaving the sidewalk.

Resource change will be moderate-low with the implementation of AMM's listed below. The proposed project will transform the western edge of the site from a vegetated slope to an engineered wall, and will remove the trees that provide a visual screen between Ocean Avenue and the I-280 off-ramp. The cypress trees cannot be safely replaced at the same location, but replacement planting would occur in the project area to the extent feasible, in accordance with Caltrans' Replacement Highway Planting Policy.

Visual impacts are determined by assessing changes to the visual resources and predicting viewer response to those changes. A No Build Alternative would continue to have issues of erosion and vegetation loss along the off-ramp, and sidewalk heaving caused by cypress root intrusion would worsen along Ocean Avenue. The proposed build alternative would cause moderate low change to visual resources, and is anticipated to have a moderate low viewer response. The project would therefore have an overall moderate low visual impact. The visual character would be more engineered, but would remain vegetated. Scenic vistas and light and glare will not be altered.

The following measures to avoid or minimize visual impacts would be incorporated into the project:

1. Tree and vegetation removal would be minimized to the extent feasible

2. Trees and vegetation outside of clearing and grubbing limits shall be protected from the contractor's operations, equipment, and materials storage.

3. Replacement Highway Planting will be provided in all areas of highway planting removal where Right of Way allows. Where replacement planting is not possible at the removal location, replacement will be provided in adjacent planting areas along the project corridor.

4. Retaining walls would incorporate aesthetic treatments that use context-sensitive wall texture and color.

8E.8 Air Quality Conformity

The project alternative is fully compatible with the design concept and scope described in the current regional transportation plan.

Interagency Consultation and public involvement requirements related to PM2.5 have been completed in accordance with the Transportation Conformity Guidance for Quantitative Hot Spot Analyses in PM 2.5 and PM 10 Nonattainment and Maintenance Areas (U.E. EPA, 2015). The Interagency Consultation partners concurred that the project is not exempt from conformity analysis requirements, but that it is not a Project of Concern for PM2.5 as defined at 40CFR 93.123(b)(1). As such, an explicit, detailed PM2.5 hot spot analysis is not required.

8E.9 Construction Greenhouse Gas (GHG)

Construction emissions were estimated using the BAAQMD-recommended California Emissions Estimator Model (CalEEMod), Version 2016.3.1. Total construction GHG emissions were estimated at 301 Metric Tons (MT) CO_2e. Table 24 shows the total construction GHG emissions associated with the proposed project.

Table 24
Total Construction Related GHG Emissions

Build Alternative	Parameters			TOTAL
	CO_2 (Tons)	CH_4 (Tons)	N_2O (Tons)	CO_2e (MT)
TOTAL	300.00	0.05	0.00	301.37

8F. Title VI Considerations

Existing provisions for low-mobility and minority groups will not be altered by the proposed project.

9. OTHER CONSIDERATIONS AS APPROPRIATE

9A. Route Matters

The proposed project improvements along the existing freeway portions of I-280 will not change the existing interchange ramp access points to the mainline.

9B. Permits

The Project is under the jurisdiction of the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB). The SFBRWQCB implements the San Francisco Bay Basin Water Quality Control Plan to regulate surface and groundwater quality in the region. The project area is mostly within Caltrans' right of way and is covered by Caltrans' Municipal Separate Sewer System (MS4) permit and Statewide Storm Water Management Plan.

Projects on the state highway system are covered by a National Pollutant Discharge Elimination System (NPDES) statewide permit issued to Caltrans by the State Water Resources Control Board. This permit covers all Caltrans properties, facilities, and activities for both the construction and operational phases of projects. This NPDES permit also requires that both structural and nonstructural BMPs be incorporated into projects to minimize the potential for both short- and long-term degradation of water quality.

To comply with the conditions of the Caltrans NPDES permit and address the temporary water quality impacts from project construction, construction activities will comply with Standard Specifications 13-2, "Water Pollution Control Program."

The project is not anticipated to impact jurisdictional waters and will not require a permit under Section 401 of the Clean Water Act (CWA) through the SFBRWQCB, or a permit under Section 404 of the CWA, issued by the United States Army Corps of Engineers.

If a protected species or active roosts or nests are discovered during construction, U.S. Fish and Wildlife Service (USFWS) and/or California Department of Fish and Wildlife (CDFW) will be notified immediately. Work may be stopped on the sight until the appropriate corrective measures have been conducted, and it is determined that no animal will be harmed.

A Caltrans encroachment permit will be required for construction of the proposed improvements in the State right of way. An SFPW excavation permit will be required for the work along Ocean Avenue in the CCSF right of way.

9C. Agreements

A Cooperative Agreement for project approval and environmental document (PA&ED) activities between SFCTA and Caltrans was executed on February 10, 2016 (District Agreement No. 04-2582). SFCTA will be the implementing agency to advertise, award, and administer the project. A separate Cooperative Agreement for design, right of way activities, and construction activities will need to be executed between SFCTA and Caltrans prior to the next phase of the project. A cooperative agreement report will be the authorizing document for the execution of this agreement.

A freeway maintenance agreement between the City and County of San Francisco and Caltrans was executed on July 2, 2009. The maintenance agreement covers Route 280 in addition to Routes 1, 35, 82, and 101 within the City and County of San Francisco.

A freeway agreement between Caltrans and City and County of San Francisco that includes the SB I-280 off ramp to Ocean Avenue was executed on February 20, 1962. Since the proposed reconfiguration of the Ocean Avenue off ramp would result in minor directional change in exiting traffic and no new ramp access or removal of existing access, change to the 1962 freeway agreement is not warranted.

9D. Transportation Management Plan for Use during Construction

A copy of the approved TMP Data Sheet prepared for the project is included in Attachment G. The project duration would be approximately 18 months. The total estimated cost of the TMP elements is $104,500. The City will be responsible for the constructability review.

9E. Stage Construction

SFCTA conducted a project constructability review on August 17, 2018. This included review of the project work plan, schedule, traffic impact, noise impact, and coordination with adjacent projects. SFCTA determined that the construction of the preferred alternative is feasible. Additional constructability reviews will be conducted during the final design phase, during which time SFCTA will obtain and include additional information from potholing, boring, and surveys. The close proximity of transit stations and schools will require close coordination with the affected parties.

To ensure that traffic operations are not impacted during construction, the construction sequences would be phased to preserve existing lane capacity and movements. The construction staging concept for the proposed ramp realignment is described below. During the design phase, a more detailed construction staging concept and plans will be developed as the off-ramp realignment design progresses.

Stage 1

a) Install traffic signal components at intersection and overhead electrical work for SF Muni Light Rail.

b) Widen existing Ocean Avenue along the north side from the proposed T-intersection location to the existing off-ramp intersection with Ocean Avenue.

c) Construct the T-intersection portion of the off-ramp while maintaining current ramp traffic.

Stage 2

a) Construct retaining wall and number two lane of proposed ramp along the west side of the existing off-ramp.

b) Place overlay along existing pavement up to finished grade between new roadway sections constructed in Stage 1c and Stage 2a. This stage would require night time closure of the existing off-ramp for up to three nights. Advanced notification of ramp closures would be posted and temporary detours would be established as part of the construction traffic management plan.

c) Turn on signal and shift traffic off of existing ramp and onto new roadway sections constructed in stages 1c, 2a, and 2b.

Stage 3

a) Remove existing ramp and construct remaining portion of proposed off-ramp, including the number one lane, shoulder, gore area, and barrier.

b) Place overlay along existing pavement up to finished grade between new roadway sections constructed in Stage 1c and Stage 3a.

Stage 4

a) Construct final pavement layer and striping and signing work. Stage 4 would require night time closure of the existing off-ramp for up to three nights. Advanced notification of ramp closures would be posted and temporary detours would be established as part of the construction traffic management plan to be adopted for the project. During night time ramp closure periods, traffic can utilize the Geneva off-ramp and/or Monterey off-ramp for detour routes.

b) Install landscape planting at areas that have been affected by construction activity.

9F. Americans with Disabilities Act Compliance

The latest version of Caltrans Design Information Bulletin (DIB) 81, "Capital Preventative Maintenance Guidelines," includes guidelines for upgrading existing curb ramps to current standards or installing new curb ramps where they are missing. The latest version of Caltrans DIB 82, "Pedestrian Accessibility Guidelines for Highway Projects," provides design guidance on pedestrian accessibility for highway projects. The proposed project improvements will comply with Americans with Disabilities Act (ADA) and Caltrans requirements for pedestrian facilities.

10. FUNDING AND PROGRAMMING

The total project costs (Year 2021) for the Build Alternative that includes capital and support costs are currently estimated as summarized in Table 25.

Table 25
Estimated Total Project Costs (Year 2021) for Built Alternative

Item	Year 2021 Cost ($M)
Total Roadway Cost	$7.73
Total Structures Cost	$6.19
Right of Way and Utility Items	$2.17
Project Capital Outlay Costs ("A")	**$16.09**
PSR/PR ("K" and "0" Phases) Support	$0.75
Right of Way Support	$0.07
PS&E Support	$2.02
Construction Support	$2.12
Support Costs ("B")	**$4.96**
Total Project Costs ("A" + "B")	**$21.05**

A preliminary project cost estimate is provided in Attachment D. An escalation factor of 5 percent per year is assumed to derive the Year 2021 preliminary construction capital costs.

Table 26 outlines the available funding for the project.

Table 26
Available Project Funding

Funding Source	Amount ($M)
Local – SFCTA Prop K Sales Tax	$3.0
State – Local Partnership Program	$3.0
Federal – Highway Safety Improvement Program (HSIP)	$15.05
Total Available Funding	**$21.05**

11. DELIVERY SCHEDULE

Table 27 presents the current estimated major milestone schedule for the project.

Table 27
Current Major Milestone Schedule

Project Milestone	Date
Begin PSR/PR and Environmental Documents	February 2016
Project Approval and Environmental Documents (PA&ED)	October 2020
Begin PS&E	January 2021
End 100% PS&E	January 2022
Right of Way Certification	March 2022
Ready to List (local advertisement, award, approve construction contract – AAA)	April 2022
Advertise Project	April 2022
Begin Construction	July 2022
End Construction (18 months)	December 2023

12. RISKS

A preliminary project Risk Register has been prepared for the project and is included in Attachment H. The following four risks are anticipated to have a high probability of occurrence and will need to be closely monitored during PS&E phase:

- Temporary Construction Easement
- Right of Way Availability
- Timely Reviews by Department
- Competing Construction Projects.

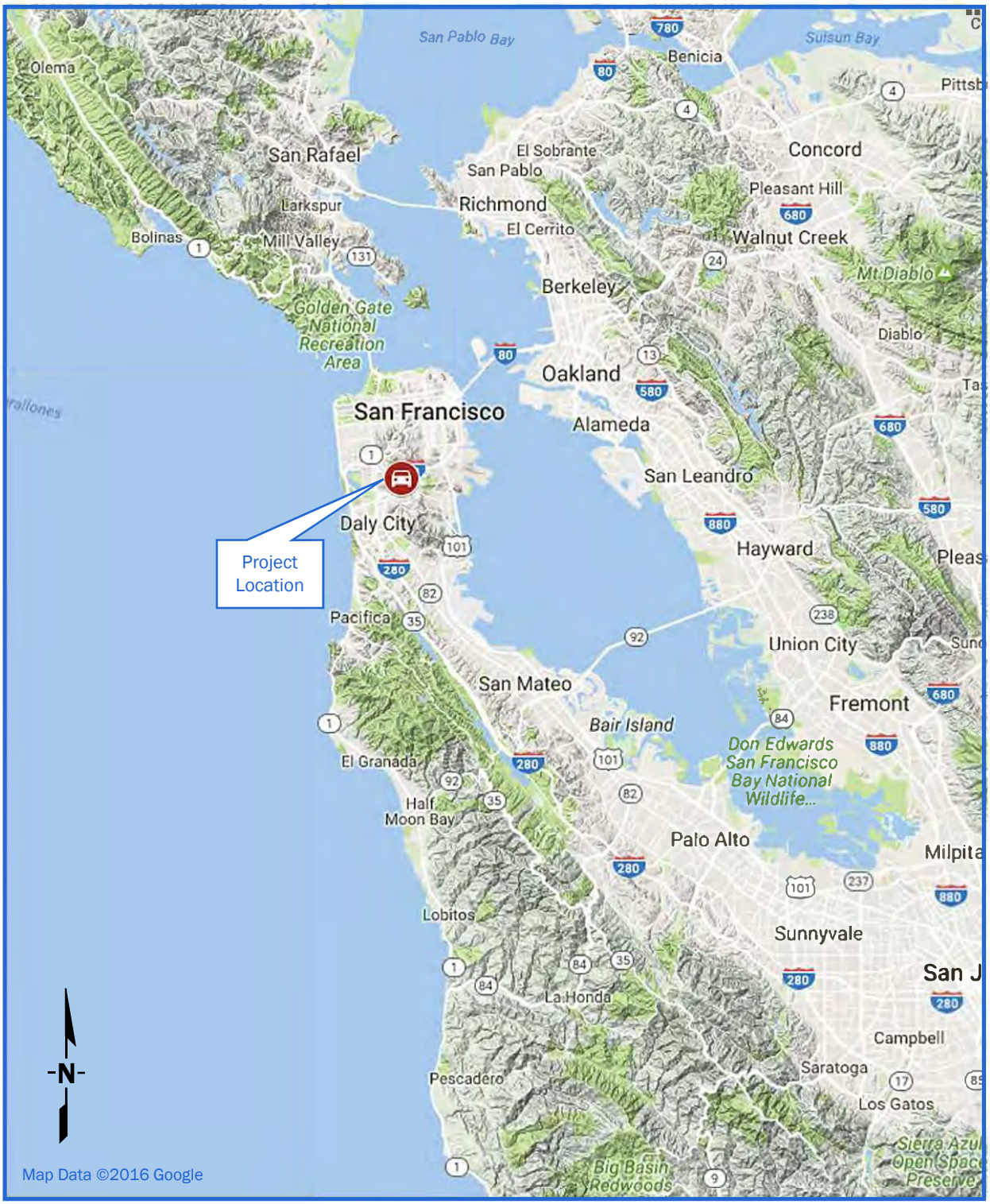
13. EXTERNAL AGENCY COORDINATION

The project requires the following coordination:

- **Federal Highway Administration:** Funding – Federal Highway Safety Improvement Plan (HSIP)
- **US Fish and Wildlife Service**
- **California Department of Fish and Wildlife**
- **Local Agency:** Agreements with SFMTA, SF Public Works
- **Other:** City College of San Francisco (CCSF)

ATTACHMENT A
Location Map

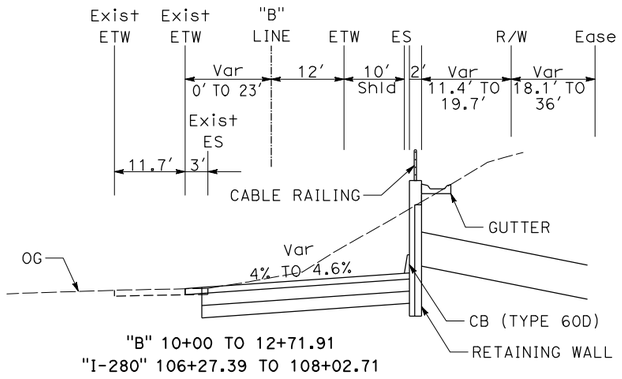
I-280 SOUTHBOUND OCEAN AVENUE OFF-RAMP REALIGNMENT PROJECT AT BALBOA PARK



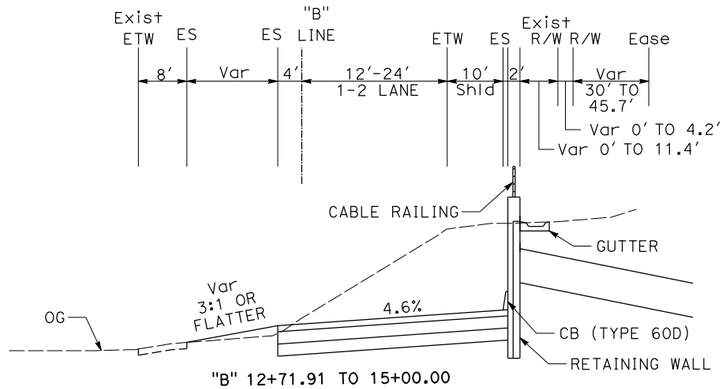
LOCATION MAP

AECOM

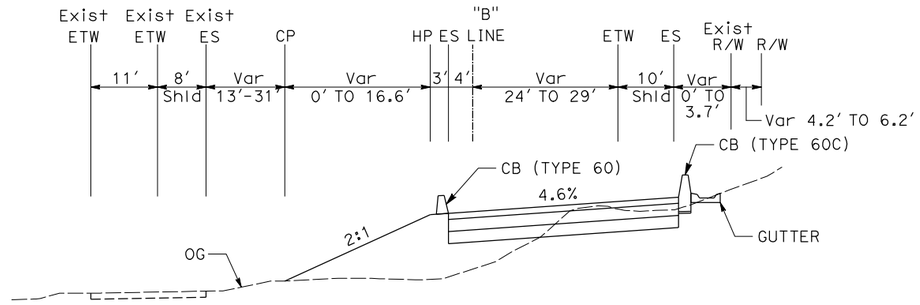
ATTACHMENT B
Proposed Design Features



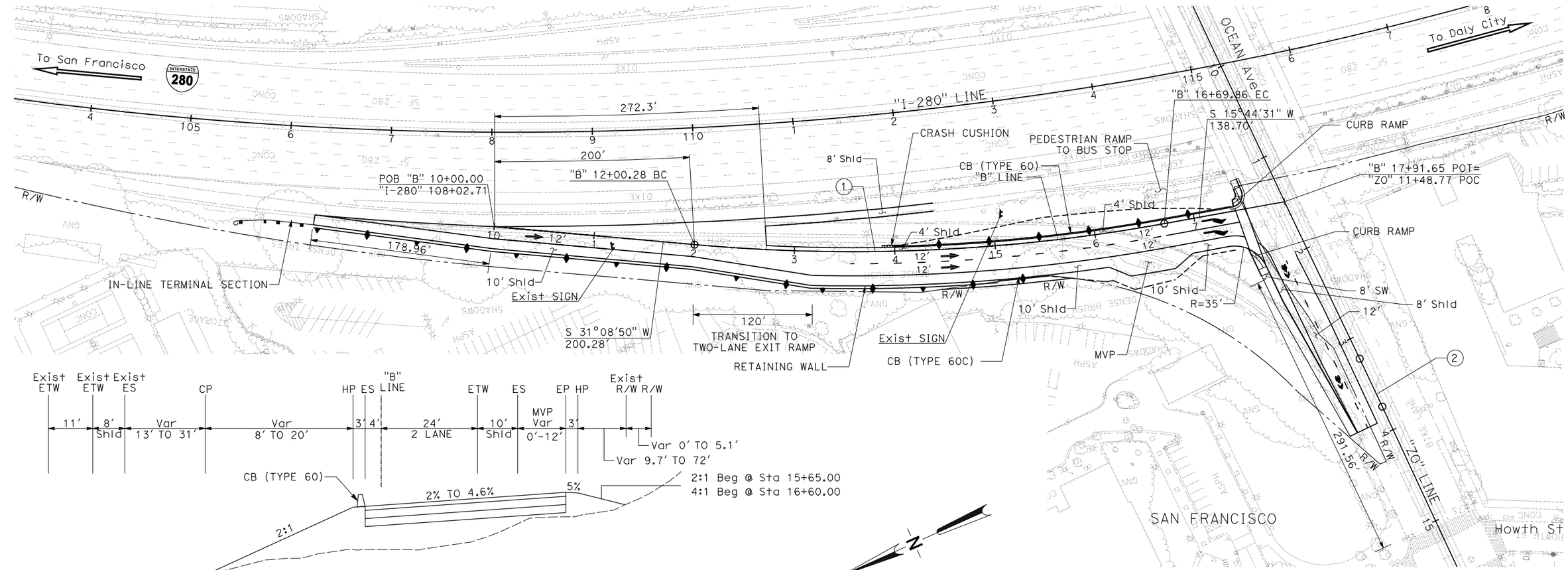
"B" 10+00 TO 12+71.91
"I-280" 106+27.39 TO 108+02.71



"B" 12+71.91 TO 15+00.00



"B" 15+00.00 TO 15+50.00



"B" 15+50.00 TO 17+43.46

CURVE DATA

No.	R	△	T	L	N-COORDINATE	E-COORDINATE
(1)	1746.45'	15°24'20"	236.21'	469.58'	2091225.060	5999926.474
(2)	5000.00'	0°36'17"	26.39'	52.77'	2096582.837	5998073.417

0 100 200 Ft

AECOM
300 California Street
Suite 600
San Francisco, CA 94104

EA 04-0K820
PID 0416000144
SCALE: 1"=100'

I-280 Interchange
Modifications at Balboa Park
San Francisco

FIGURE
1
January 2019

ATTACHMENT C
Proposed Profile and Superelevation

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SF	280	1.77/1.95	-	-

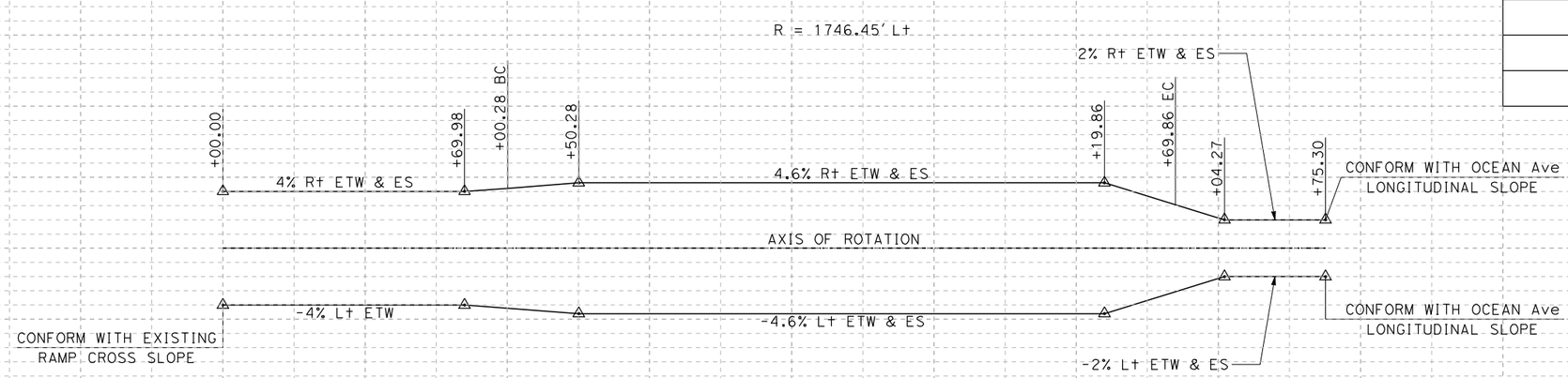
REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. Exp. CIVIL — STATE OF CALIFORNIA

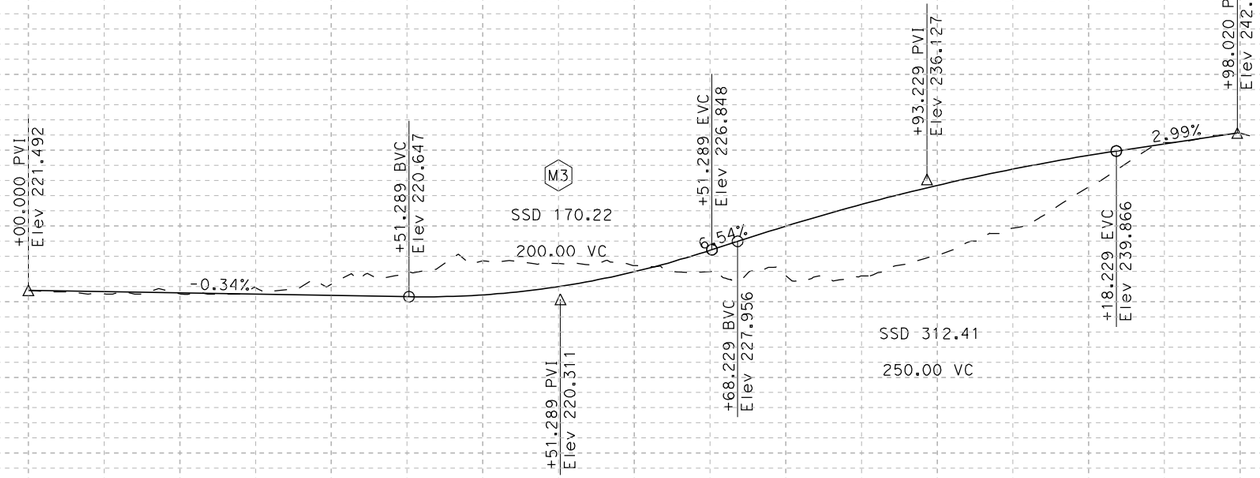
AECOM
300 CALIFORNIA St
SUITE 600,
SAN FRANCISCO, CA 94104

SAN FRANCISCO COUNTY
TRANSPORTATION AUTHORITY
1455 MARKET St,
SAN FRANCISCO, CA 94103



SUPERELEVATION DIAGRAM

"B" LINE



PROFILE

"B" LINE

PROFILE AND SUPERELEVATION DIAGRAM

SCALE: Horiz 1" = 50'
Vert 1" = 10'

STATION: 10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 TOTAL

CY Exc

CY Emb

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

CONSULTANT FUNCTIONAL SUPERVISOR: DAVID FYFE

CALCULATED-DESIGNED BY

CHECKED BY

REVISED BY

DATE REVISED

LAST REVISION 08-29-17

DATE PLOTTED => 7/19/2018
TIME PLOTTED => 11:12:26 AM

BORDER LAST REVISED 7/2/2010

USERNAME => raymond.lim
DGN FILE => Alt 5 Profile and Super.dgn

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0741

PROJECT NUMBER & PHASE 0416000144

ATTACHMENT E
Right of Way Data Sheet

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

RIGHT OF WAY DATA SHEET FOR LOCAL PUBLIC AGENCIES

EXHIBIT
17-EX-21 (Rev 12/2014)

To: Julie McDaniel
District Office Chief
R/W Local Programs

Date: October 9, 2020

Attention: Kristin Schober
District Branch Chief
Local Programs

Co. SF Rte. 280 PM. 1.8/2.0
Expense Authorization: 04-0K820
Project ID: 04-16000144

Subject: **RIGHT OF WAY DATA SHEET- LOCAL PROGRAMS**

Project Description: I-280/Ocean Ave Interchange SB Ramp Modifications, San Francisco

Right of way necessary for the subject project will be the responsibility of the San Francisco County Transportation Authority.

The information in this data sheet was developed by AECOM / Associated Right of Way Services.

I. ***Right of Way Engineering***

What level of right of way engineering is required for this project?

___ Minimal (Requires Right of Way Retracement Narrative)

- No fee or easement acquisitions are required for the project; AND
- No excess lands will be created by the project; AND
- No Temporary Construction Easements (TCEs) are required for the project; AND
- No retaining walls, sound walls, footings, signs, traffic signals, or similar improvements will be constructed within ten feet of the existing right of way line.

___ Minor (Requires Land Net, and PS&E Project Control sheets)

- No fee or easement acquisitions are required for the project; AND
- No excess lands will be created by the project; AND one or both of the following:
- Temporary Construction Easements (TCEs) are required for the project;
- Improvements will be constructed within ten feet of the existing right of way line.

___ Moderate (Requires Land Net, PS&E Project Control sheets, Base Map, and Appraisal Map)

- At least one fee and/or easement (except TCEs) acquisition is required for the project; AND
- No excess lands will be created by the project; AND
- No parcels will be transferred to the State.

_X_ Major (Requires full compliance with Right of Way Manual and Local Public Agency Coordination (LPAC) Guidelines including, but not limited to, pre-design Record of Survey, Base Map, Appraisal Map, legal descriptions and deeds, property transfer documents, JUAs/CCUAs, Record Map, monuments, and one or more Record of Surveys)

- One or more fee and/or easement parcels will be transferred to the State; AND/OR
- Excess lands will be created by the project.

II. ***Engineering Surveys***

Is any surveying or photogrammetric mapping required?

___ No (Provide explanation)

_X_ Yes (Complete the following)

Datum Requirements

1. The units for this project are

_X_ U. S. Survey Feet;

___ Metric (Provide explanation).

2. The horizontal datum for this project is

_X_ California Coordinate System of 1983 (NAD 83 , Epoch 2010);

___ California Coordinate System of 1983 (NAD 83 (_____), Epoch _____);
(Provide Datum Tag and Epoch).

___ Other (Provide explanation).

3. The vertical datum for this project is

_X_ North American Vertical Datum of 1988 (NAVD 88);

___ National Geodetic Vertical Datum of 1927 (NGVD 27) (Provide explanation).

___ Other (Provide explanation).

III. ***Parcel Information (Land and Improvements)***

Are there any property rights required within the proposed project limits?

No _____ Yes _X_ (Complete the following)

Provide a general description of the right of way and excess lands required (zoning, use, major improvements, critical or sensitive parcels, etc.)

Item #	APN/Owner	Property Address	Existing Use	Acquisition
1	3179-010 / San Francisco Community College	50 Phelan Ave. San Francisco, CA 94112	Education facility	Partial: Fee simple, subsurface permanent easement, and temporary construction easement needed for off-ramp widening and realignment and for construction of a retaining wall with ground anchors. Ground anchors will extend completely underground from the wall within the right-of-way and extend outside the right-of-way into adjacent subject

				property.

Right of Way Cost Estimate:

		Current Value	Escalation Rate		Escalated Value
A.	Acquisition, including Excess Lands, Damages, and Goodwill	$1,260,675	10	%	$1,456,080
	Environmental Mitigation	$0	0	%	$0
	Grantor's Appraisal Cost	$5,000	N/A		$5,000
B.	Utility Relocation - Project Liability (from Section VII)	$650,000	5	%	$699,500
C.	Relocation Assistance	$0	0		$0
D.	Clearance Demolition	$0	0	%	$0
E.	Title and Escrow Fees	$5,000	0	%	$5,000
F.	**TOTAL ESCALATED VALUE**				**$2,165,580**
G.	Railroad Construction Costs (flagger, track work etc)	$0	(These are construction costs to be included in PS&E)		
H.	Construction Contract Work	$0	(These are construction costs to be included in PS&E)		
I.	**TOTAL PARCEL COUNT**	1			

IV. ***Dedications***

Are there any property rights that have been acquired, or anticipate will be acquired, through the "dedication" process for the Project?

No __X___ Yes _____ (Complete the following)

Number of dedicated parcels: _____

Have the dedication parcel(s) been accepted by the municipality involved?No _____ Yes

V. ***Excess Lands / Relinquishments***

Are there Caltrans property rights which may become excess lands or potential relinquishment areas?

No __X___ Yes _____ (Provide an explanation in Remarks Section XIII.)

VI. ***Relocation Information***

Are there relocations anticipated? YES ____ NO __X__
(If yes, provide the following information)

No. of personal property relocations _____

No. of single family _____ No. of business/non profit _____

No. of multi-family _____ No. of farms _____

Based on Draft / Final Relocation Impact Statement / Study (circle one) –
Dated _____, it is anticipated that sufficient replacement housing
N/A, will / will not be available without Last Resort Housing.

VII. ***Utility Relocation Information***

Anticipate any utility facilities or utility rights of way to be affected?
No _____ Yes ___X__ (Complete the following)

		Estimated Relocation Expense		
Facility	Owner	State Obligation*	Local Obligation	Utility Owner Obligation
A. Relocation of PG&E duct bank and PG&E electrical vault into Ocean Ave. Liability is 50/50 based on Section 5(C) of the Freeway Master Contract between the State of California and Pacific Gas and Electric Company dated November 1, 2004.	PG&E	$	$400,000	$400,000
B. Relocation of three (3) SFMTA Muni Overhead Contact System (OCS) poles.	SFMTA	$	$250,000	$
C.		$	$	$
Totals				
Number of facilities ___2		$	$650,000	$400,000

*This amount reflects the estimated total financial obligation by the State.
The following checked items may seriously impact lead time for utility relocation:

____ Longitudinal policy conflict(s)
____Environmental concerns impacting acquisition of potential easements
_____Power lines operating in excess of 50 KV and substations

VIII. ***Rail Information***

Are railroad facilities or railroad rights of way affected?

No ___ Yes __X__ (Complete the following)

Describe railroad facilities or railroad rights of way affected.

Owner's Name	Transverse Crossing	Longitudinal Encroachment
A. SFMTA	X	
B.		

Discuss types of agreements and rights required from the railroads. Are grade crossings requiring services contracts, or grade separations requiring construction and maintenance agreements involved?

A construction agreement may be required between SFCTA and SFMTA for relocation of the Muni OCS poles.

IX. ***Clearance Information***

Are there improvements that require clearance?

No __X__ Yes ____ (Complete the following)

A. Number of Structures to be demolished _____
B. Estimated Cost of Demolition $_____
C. If there is demolition and clearance, will it be done prior to construction or as part of the construction contract?

X. ***Hazardous Materials/Waste***

Are there any sites and/or improvements in the Project Limits that are known to contain hazardous waste/materials?

None __X__ Yes _____ (Explain in the Remarks Section XIII)

Are there any sites and/or improvements in the Project Limits that are suspected to contain hazardous waste/materials?

None ___ Yes __X__ (Explain in the Remarks Section XIII)

XI. ***Project Scheduling*** ***Completion Dates***

Proposed completion of Appraisal maps and legal descriptions, if needed	October 2021
Proposed Environmental Clearance	October 2020
Proposed R/W Certification	March 2022
Proposed Ready to List (RTL)	April 2022
Proposed Construction Award	July 2022

XII. ***Proposed Funding***

	Local	State	Federal	Other
Acquisition	$1,456,080	$	$	$
Utilities	$699,500	$	$	$430,500
Relocation Assistance Program	$	$	$	$
R/W Support Costs	$50,400	$	$	$

XIII. ***Remarks***

Hazardous Materials: Representative samples of yellow traffic striping and pavement markings should be collected and analyzed for lead and chromium prior to construction. Alternatively, traffic striping and pavement markings may be managed as an assumed hazardous waste by implementing a lead compliance plan and testing the residues for hazardous-waste classification prior to off-site disposal in accordance with Caltrans Standard Special Provision 14-001. A 30% contingency was included in the estimated Acquisition Cost to offset potential damages and loss of business goodwill claims. The escalation rate for Acquisition Cost is estimated at 10% per year and is calculated based on an approximate 1.5 year lead time. The escalation rate for Utility Relocation is estimated at 5% per year and is calculated based on the same lead time.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
RIGHT OF WAY DATA SHEET FOR LOCAL PUBLIC AGENCIES

EXHIBIT
17-EX-21 (Rev 12/2014)

Expenditure Authorization: 04-0K820

Project Sponsor	**Project Sponsor Consultant**	**R/W Professional**
Prepared by:	Reviewed by:	Reviewed and Approved by:
Mike Tan San Francisco County Transportation Authority	David Fyfe, PE AECOM	Mark Ricards, SR/WA Associated Right of Way Services, Inc.
Project Manager Title	Project Engineer Title	Right of Way Consultant Title
October 9, 2020 Date	October 9, 2020 Date	October 9, 2020 Date

Caltrans
Reviewed and approved based on information provided to date:

Caltrans District Branch Chief Local Programs Division of Right of Way	10/9/2020 Date

The scheduled right of way lead time for this project is at risk. The right of way schedule is conditionally approved with the understanding that the right of way schedule may be adjusted, as necessary, and that all right of way activities will comply with Federal and California laws and regulations, and Caltrans' policies, procedures, standards, practices, and applicable agreements. Failure to comply with all policies and procedures could jeopardize project funding and Right of Way certification on this project.

ATTACHMENT F
Stormwater Data Report – Signed Cover Sheet

Dist-County-Route: 04-SF-280
Post Mile Limits: 1.77/1.95
Type of Work: Interchange southbound off-ramp improvements
Project ID (EA): 04-0K820
Program Identification:
Phase: ☒ PID ☒ PA/ED ☐ PS&E

Regional Water Quality Control Board(s): San Francisco Bay (Region 2)
Total Disturbed Soil Area: 2 acres Post Construction Treatment Area: N/A
Alternative Compliance (acres): N/A
Estimated Const. Start Date: 6/3/2019 Est. Const. Completion Date: 6/1/2020
Risk Level: RL 1 ☐ RL 2 ☒ RL 3 ☐ WPCP ☐ Other:
Is the Project within a TMDL watershed? Yes ☐ No ☒
TMDL Compliance Units (acres): N/A
Notification of ADL reuse (if yes, provide date): Yes ☐ Date: No ☒

This Report has been prepared under the direction of the following Licensed Person. The Licensed Person attests to the technical information contained herein and the date upon which recommendations, conclusions, and decisions are based. Professional Engineer or Landscape Architect stamp required at PS&E.

Analette Ochoa, Registered Project Engineer/Landscape Architect — 10/3/17 Date

I have reviewed the stormwater quality design issues and find this report to be complete, current and accurate:

Al Lee, Project Manager — 3/19/18 *Date*

~~*Robert Braga*~~, *Designated Maintenance Representative* — 02/20/18 *Date*

AMRINDER JHAJJ
David Yam, Designated Landscape Architect Representative — 3.20.18 *Date*

[Stamp Required at PS&E only] For *Norman Gonsalves, District/Regional Design SW Coordinator or Designee* — 03/20/2018. *Date*

ATTACHMENT G
TMP Data Sheet

C) Calculated Delays (To be performed if construction strategies in Item B do not mitigate congestion resulting from Item A)

1. Estimated Maximum Individual Vehicle Delay _____Minutes
2. Existing or Acceptable Individual Vehicle Delay _____Minutes
3. Estimated Individual Vehicle Delay Requiring Mitigation [(l) - (2)] _____Minutes
4. Estimated Delay Cost (Most Applicable)
   - ☐ Extended Weekend Closure $_____
   - ☐ Weekly (7 days) $_____
5. Estimated Duration of Project Related Delays _____
6. Cost of Construction Related Delays [(4 x 5)] $_____

D) Preliminary TMP Elements and Cost

1. Public Information
   - ☒ a. Brochures and Mailers $ 2,500
   - ☒ b. Press Release $ 5,000
   - ☐ c. Paid Advertising $_____
   - ☐ d. Public Information Center/Kiosk $_____
   - ☐ e. Public Meeting/Speakers Bureau $_____
   - ☐ f. Telephone Hotline $_____
   - ☐ g. Internet $_____
   - ☒ h. Notification to impacted groups (Bicycle users, Pedestrians with disability, others.) $ 5,000
   - ☐ i. Others _____ $_____

SUB TOTAL
$ 12,500

2. Motorists Information strategies
   - ☐ a Changeable Message Signs (Fixed) $_____
   - ☒ b. Changeable Message Signs (Portable) $ 8,500
   - ☒ c. Ground Mounted Signs $ 8,500
   - ☐ d. Highway Advisory Radio $_____
   - ☐ e. Caltrans Highway Information Network (CHIN) $_____
   - ☐ f. Revised Transit Schedules/Maps $_____
   - ☐ g. Others _____ $_____

SUB TOTAL **$** 17,000

3. Incident Management
   - ☒ a. Construction or Maintenance Zone Enhanced Enforcement Program (COZEEP or MAZEEP) $ 10,000
   - ☐ b. Freeway Service Patrol $_____
   - ☒ c. Traffic Management Team $ 15,000
   - ☐ d. New CCTVs and Detectors $_____
   - ☐ e. Others _____ $_____

SUB TOTAL $ 25,000

4. Construction Strategies (In Addition to Elements Identified on Item B)
   - [x] a. Off Peak/Night/Weekend Work (Lane Closure Charts) $ 50,000
   - [ ] b. Reversible Lanes $
   - [ ] c. Total Facility Closure $
   - [ ] d. Extended Weekend Closure $
   - [ ] e. Truck Traffic Restrictions $
   - [ ] f. Reduced Speed Zone $
   - [ ] g. Connector and Ramp Closures $
   - [ ] h. Incentive and Disincentive $
   - [ ] i. Moveable Barrier $
   - [ ] j. Others _____ $

SUB TOTAL $ 50,000

5. Demand Management
   - [ ] a. HOV Lanes/Ramps (New or Convert) $
   - [ ] b. Park and Ride Lots $
   - [ ] c. Rideshare Incentives $
   - [ ] d. Variable Work Hours $
   - [ ] e. Telecommute $
   - [ ] f. Ramp Metering (New Installation) $
   - [ ] g. Ramp Metering (Maintain Existing) $
   - [ ] h. Others _____ $

SUB TOTAL $ 0

6. Alternate Route Strategies
   - [ ] a. Add Capacity to Freeway Connector $
   - [ ] b. Street Improvement (widening, traffic signal, etc) $
   - [ ] c. Traffic Control Officers $
   - [ ] d. Parking Restrictions
   - [ ] e. Others _____ $

SUB TOTAL $ 0

7. Other Strategies
   - [ ] a. Application of New Technology $
   - [ ] b. Others _____ $

SUB TOTAL $ 0

8. The Project includes the following: (Check applicable type of facility closures)
   - [ ] a. Highway or Freeway Lanes
   - [ ] b. Highway or Freeway Shoulders
   - [ ] c. Full Freeway Closure
   - [x] d. Freeway On/Off-Ramps
   - [ ] e. Freeway Connectors
   - [x] f. Local Streets

☐ g. Prolonged Ramp Closures

9. Major operations requiring traffic control and working days for each

Operation	# of Working Days	# of Traffic Control Days
☒ a. Clearing and Grubbing	12	2
☒ b. Existing Feature Removal	30	3
☐ c. Excavation of Embankments Construction		
☒ d. Structural Section Construction	54	17
☐ e. Drainage Feature Construction		
☒ f. Structures Construction	136	2
☐ g. MBGR/Barrier Construction		
☒ h. Striping	10	2
☒ i. Electrical Component Construction	15	5
☐ j. Other		
Total days	257	36

TOTAL ESTIMATED COST OF TMP ELEMENTS =

$ 104,500

Notes : Extensive TMP may be required for the significant impacts.

PREPARED BY (Consultant) David D Fyfe DATE 7/18/2019
David Fyfe, P.E.

APPROVAL RECOMMENDED BY
(Caltrans Oversight Engineer) _____ DATE 10/22/19

APPROVED BY (TMP Office) _____ DATE 12/3/19

ATTACHMENT H
Risk Register

LEVEL 2 - RISK REGISTER		Project Name:	SFCTA I-280 Interchange Modifications at Balboa Park		DIST- EA	04-0K820	Project Manager	David Fyfe						
Risk Identification							Risk Assessment						Risk Response			
Status	ID #	Type	Category	Title	Risk Statement	Current status/assumptions	Probability	Cost Impact	Cost Score	Time Impact	Time Score	Rationale	Strategy	Response Actions	Risk Owner	Updated
Active	1	Threat	Construction	Excavation	Construction would require excavation to a maximum depth of 25 feet, which could impact adjacent properties	Active, to be confirmed and tracked during PS&E phase.	2-Low	4 -Moderate	8	4 -Moderate	8	Typically easily mitigated during design	Accept	During design, develop alignment to minimize required excavation and maximize offset from adjacent properties	Designer	1/11/2019
Active	2	Threat	Right of Way	Temporary Construction Easement	A temporary construction easement (TCE) of approximately 10 feet by 100 feet may be required along the existing ramp.	Active, to be confirmed and tracked during PS&E phase.	4-High	2 -Low	8	2 -Low	8	TCE will likely be necessary due to limited ROW availability and project geometry.	Avoid	Develop alignment to maximize offset from adjacent properties. Coordinate with adjacent properties early where TCE will potentially be needed	SFCTA	1/11/2019
Active	3	Threat	Right of Way	Right of Way Availability	Proposed retaining wall will require Right of way (ROW) acquisition, which will result in additional cost to the project	Active, to be confirmed and tracked during PS&E phase.	4-High	4 -Moderate	16	2 -Low	8	Limited ROW availabilty and project geometry.	Mitigate	Develop alignment to maximize offset from adjacent properties. Coordinate with adjacent properties early where property rights will potentially be needed	SFCTA	1/11/2019
Active	4	Threat	Design	Design Standards Exceptions	Exceptions from Design Standards may be required to keep the projects within scope/schedule of budget. Some potential issues may be vertical sight distance, superelevation, corner sight distance, local street interchange, departure angle, side slope, vertical curve, and deceleration length that may need to be supplemented and documented in the PS&E Phase.	Active, to be confirmed and tracked during PS&E phase.	2-Low	2 -Low	4	4 -Moderate	8	Majority (if not all) of the exceptions to design standards were determined during PA/ED. Liklihood of additional exceptions is low.	Accept	Early coordination with Caltrans Design Reviewers, with regular follow-up and close out meetings	Designer	1/11/2019
Active	5	Threat	PM	Schedule Delays	The project may encounter unanticipated project constraints or additional requirements during the life of the project leading to unanticipated schedule delays resulting in additional cost and time extension to internal milestone.	Active, to be confirmed and tracked during PS&E phase. Timely reviews by department are necessary.	4-High	2 -Low	8	8 -High	32	Industry is very busy and resources are limited. Staff may be reassigned to higher priority projects or transfer to other units.	Mitigate	Ensure that team members are aware of deadlines and their importance. Distribute current schedules at monthly PDT meetings and draw attention to critical path items. Steering committees to monitor using the list of deliverables.	SFCTA	1/11/2019
Active	6	Threat	PM	New stakeholder needs	New stakeholders and/or new stakeholder needs could be identified late in the project. As a result, the scope, cost, and/or schedule could be affected.	Active, to be confirmed and tracked during PS&E phase.	3-Moderate	3 -Low	9	2 -Low	6	Multiple stakeholders in the project area.	Mitigate	Obtain major stakeholder buy-in during PA&ED Phase including Caltrans Maintenance, HQ Design Coordinators, Traffic Safety, etc. Hold public workshops to get input	SFCTA	1/11/2019
Active	7	Threat	Construction	Unexpected environmental issues during construction	Unexpected environmental issues (archaeological, biological, etc.) could lead to schedule delays and increased mitigation costs	Active, to be confirmed and tracked during PS&E phase.	2-Low	2 -Low	4	4 -Moderate	8	Most (if not all) potential environmental issues were identified during PA/ED phase.	Mitigate	Field studies were complete during PA&ED. Risks of unexpected discovery during construction can be reduced by isolating construction work at that location, per avoidance measures listed in final environmental document.	SFCTA	1/11/2019
Active	8	Threat	Construction	Man-made buried objects	Construction crews may encouter man-made objects that are not shown on the plans. The contractor will need to be compensated for handling such items, resulting in increased costs	Active, to be confirmed and tracked during PS&E phase.	2-Low	4 -Moderate	8	2 -Low	4	Roadway and College has already disturbed much of this area. No nearby bodies of water that may increase this probablility.	Accept	Every effort should be made to discover these objects during the planning and design phases. Added costs for those that are not found should be covered by the 5% contingencies.	SFCTA	1/11/2019
Active	9	Threat	Environmental	Migratory birds	If nesting birds are found, designated areas of the construction site could be off limits which could case construction delays	Active, to be confirmed and tracked during PS&E phase.	2-Low	2 -Low	4	4 -Moderate	8	Trees proposed to be removed prior to nesting periods.	Accept	Risk will be minimized. The Natural Environmental Study (NES) specifies that six trees are propsed to be removed prior to nesting periods and preconstruction surveys performed prior to vegetation clearance to verify no nesting activity present. One special-status bird species to look out for is the American peregrine falcon found in the NES. If nesting identified, it will be avoided until vacated.	SFCTA	1/11/2019
Active	10	Threat	Design	Geotechnical site conditions reveal poor soil conditions	Geotechnical testing could encounter vulnerability to geologic hazards, soil-related hazards, unsuitable materials, and/or other impacts on the project cost and schedule	Active, to be confirmed and tracked during PS&E phase.	2-Low	4 -Moderate	8	2 -Low	4	It is unlikely that testing and final Geotechnical evaluation will show findings that vary significantly from preliminary stage.	Accept	Preliminary Geotechnical Report (PGR) was prepared during PA/ED to provide recommendations for design assessing any impacts. Additional investigations will be needed in PS&E Phase	Designer	1/11/2019
Active	11	Threat	PM	Coordination with other projects	Other planned and proposed projects in the area could impact the scope, schedule, and cost of the project.	Active, to be confirmed and tracked during PS&E phase.	2-Low	4 -Moderate	8	4 -Moderate	8	SFCTA coordinates regularly with other agencies that have jurisdiction in the project area.	Mitigate	Periodically review potential conflicting projects and confirm their direction through management meetings	SFCTA	1/11/2019

LEVEL 2 - RISK REGISTER				Project Name: SFCTA I-280 Interchange Modifications at Balboa Park			DIST- EA	04-0K820	Project Manager	David Fyfe						
Risk Identification							Risk Assessment						Risk Response			
Status	ID #	Type	Category	Title	Risk Statement	Current status/assumptions	Probability	Cost Impact	Cost Score	Time Impact	Time Score	Rationale	Strategy	Response Actions	Risk Owner	Updated
Active	12	Threat	PM	Competing construction projects	Projects could be competing for bid services from contractors and material sources, potentially raising prices	Active, to be confirmed and tracked during PS&E phase.	4-High	4 -Moderate	16	2 -Low	8	Currently experiencing a very competitive construction market.	Mitigate	Track competing projects and try to schedule construction with them in mind	SFCTA	1/11/2019
Active	13	Threat	Construction	Integrated Traffice Signal/Traffic Signal Priority (ITS/TSP) Implementation & Testing Schedule	Contractor & Integrator must coordinate installation activities to successfully open the new off-ramp. Lack of coordination could cause delays of highway constructrion and/or installation could result in claims.	Active, to be confirmed and tracked during PS&E phase.	2-Low	4 -Moderate	8	4 -Moderate	8	SFCTA coordinates regularly with SFMTA and other agencies	Monitor	Coordinate Signal Timing early with SFMTA to help ensure proposed off-ramp signal timing works with Ocean Ave Corridor Signal Timing. Provide RFP & specification language to define interface.	SFCTA/ Designer	1/11/2019
Active	14	Threat	Design	Unforeseen utility conflicts	Utility relocations could be needed due to conflict of policy (clear recovery) when no utility relocations are anticipated. Early identification and coordination with utility service providers may still be insufficient. Delay of Right of Way Certification & project delivery.	Active, to be confirmed and tracked during PS&E phase.	2-Low	4 -Moderate	8	4 -Moderate	8	Identification of all utilities within project area should be attainable early in PS&E phase.	Accept	Early identification and coordination of utilies within the project limit. Adjust locations of facilities if conflicts arise. Potholing will be conducted during PS&E phase to minimize conflicts.	Designer	1/11/2019
Active	15	Threat	Design	Positive locating of utilities	The project proposes to defer the locating of underground utility crossings to the PS&E phase.If potholing efforts reveal that utilities require relocation, it could increase the project cost and potentially delay the schedule.	Active, to be confirmed and tracked during PS&E phase.	2-Low	4 -Moderate	8	2 -Low	4	Identification of all utilities within project area should be attainable early in PS&E phase.	Accept	Begin potholing efforts early during PS&E phase. Consider advance utility relocation contract prior to construction.	Designer	1/11/2019
Active	16	Threat	PM	New Caltrans Policy or change to existing policy	If there is a new policy introduced or an existing policy is revised, it could require the project to perform additional studies, delaying the schedule	Active, to be confirmed and tracked during PS&E phase.	3-Moderate	2 -Low	6	4 -Moderate	12	Standards/requirements are continuously updated.	Mitigate	Early communication with Caltrans functional units to minimize impacts of policy changes	Designer	1/11/2019
Active	17	Threat	PM	Local agencies or private property owners request additional improvements during final design or construction	Local agencies may request additional improvements along frontage roads, such as architectural treatments, landscaping, etc. Affected private property owners may request project to make improvements to their property. These additional improvements could introduce additional costs and delay right of way agreements and PS&E delivery.	Active, to be confirmed and tracked during PS&E phase.	3-Moderate	2 -Low	6	2 -Low	6	Past discussion with City College indicates that there is a likelihood they will request minor improvements	Mitigate	Control scope creep. Early involvement of local cities and county at the PDT meeting could identify improvements early to mitigate delay	SFCTA	1/11/2019
Retired	18	Threat	Environmental	Increased backlog for permitting agencies	An increased backlog at U.S. Fish and Wildlife Service (USFWS) could delay the environmental clearance	Retired	2-Low	2 -Low	4	2 -Low	4	Environmental Clearance is complete	Mitigate	Work closely with permitting agencies to ensure approval in a timely matter	SFCTA	1/11/2019
Active	19	Threat	Construction	Impact to existing AWSS pipe	Contractor may inadvertantly damage existing Auxiliary Water Sypply System (AWSS) pipe during roadway construction activities which would cause cost and schedule impacts.	Active, to be confirmed and tracked during PS&E phase.	2-Low	4 -Moderate	8	4 -Moderate	8	Location of the utility by potholing will greatly reduce the probablility of any damage.	Mitigate	Pothole exact location of Auxiliary Water Sypply System (AWSS) pipe and survey and mark extents of roadway improvements in field to mitigate	SFCTA/ Contractor	1/11/2019
Active	20	Threat	Design	Pavement Resurfacing of Geneva Ave Off-Ramp	Caltrans may request that the project provide a smooth pavement surface along the Geneva off-ramp to mitigate any pavement scarring that may occur during construction which would increase project cost	Active, to be confirmed and tracked during PS&E phase.	3-Moderate	2 -Low	6	2 -Low	6	Heavy equipment will be required for construction.	Accept	Research any future pavement rehabilitation projects within the off-ramp by Caltrans and minimize impacts to Geneva off-ramp during design and construction.	Designer	1/11/2019

ATTACHMENT I
Intersection Control Evaluation Memorandum

MEMORANDUM

AECOM
300 California Street, Suite 600
San Francisco, CA 94104
Phone: (415) 796-8100

To: Mike Tan, SFCTA
Katie Yim, Caltrans

CC: Al Lee, Caltrans
Luis Chanchu, Caltrans

From: David Fyfe, AECOM
Ravi Puttagunta, AECOM

Date: Final March 28, 2018
Revision 2 September 25, 2017
Revision 1 March 31, 2017
Original Draft November 2, 2016

Subject I-280 SB Ocean Ave Off-Ramp Realignment Project at Balboa Park
Intersection Control Evaluation (ICE) Memorandum

1.0 Introduction

California Department of Transportation (Caltrans) has adopted the Intersection Control Evaluation (ICE) process for consideration and selection of access strategies and concepts during project development process. The ICE process information guide, *Traffic Operation Policy Directive #13-02: Intersection Control Evaluation (ICE)*, dated August 2013, provides guidelines on the ICE process. The goal of the ICE process is to identify the most effective and comprehensive access alternative by balancing the needs of all modes and users with system performance goals.

This memorandum provides an intersection control evaluation for the I-280 Southbound Ocean Avenue Off-Ramp Realignment Project at Balboa Park located in San Francisco, California. The intersection evaluated was I-280 SB Off-Ramp/Ocean Avenue.

A variety of design alternatives were recommended for consideration at the intersection and were assessed for viability and practicality. The consideration of innovative access strategies such as traffic signal systems, multi-way stop control, and yield control (Roundabouts) was evaluated. Each design alternative was screened based on a variety of design parameters including, but not limited to: safety, traffic operations, right-of-way implications, and environmental and cultural impacts. This memorandum will provide a brief description of off-ramp realignment design alternatives, initial screening, and recommendations based on the Caltrans ICE guidelines dated August 2013.

2.0 Project Purpose

The purpose of this project is to improve safety along Ocean Avenue at the southbound I-280 off-ramp intersection.

3.0 Current Configuration

The current configuration of the southbound I-280 off-ramp is a single lane, free merge onto westbound Ocean Avenue just prior to the intersection with Howth Street. Vehicles on westbound Ocean Avenue that are attempting to turn right at Howth Street into San Francisco City College are required to weave into the right lane with vehicles exiting the off-ramp, over a short distance of approximately 150 feet. Westbound cyclists on Ocean Avenue must also merge into the off-ramp receiving lane to continue on Ocean Avenue. Pedestrians along the northern sidewalk of Ocean Avenue must cross the off-ramp at a crosswalk that has minimal sign control, stating "yield to pedestrians". Under existing conditions, westbound queues along Ocean Avenue extend from the Geneva Avenue/Phelan Avenue intersection to I-280 southbound off-ramp and continue back to the I-280 mainline. Within the project study limits, Ocean Avenue eastbound and westbound movements are separated by a wide median with light rail operation. Light rail vehicles get the signal priority at intersections along Ocean Avenue within the study area.

4.0 Step One: Access Strategy and Configuration Assessment/Screening

The *ICE Process Informational Guide for Traffic Operation Policy Directive #13-02: Intersection Control Evaluation,* provides direction on the access strategies and configurations that should be considered for intersections and interchanges. The Informational Guide provides the following potential configurations to consider for intersections: Multi-Way Stop Control, Yield Control (Roundabout), and Traffic Signalization.

4.1 Multi-Way Stop Control

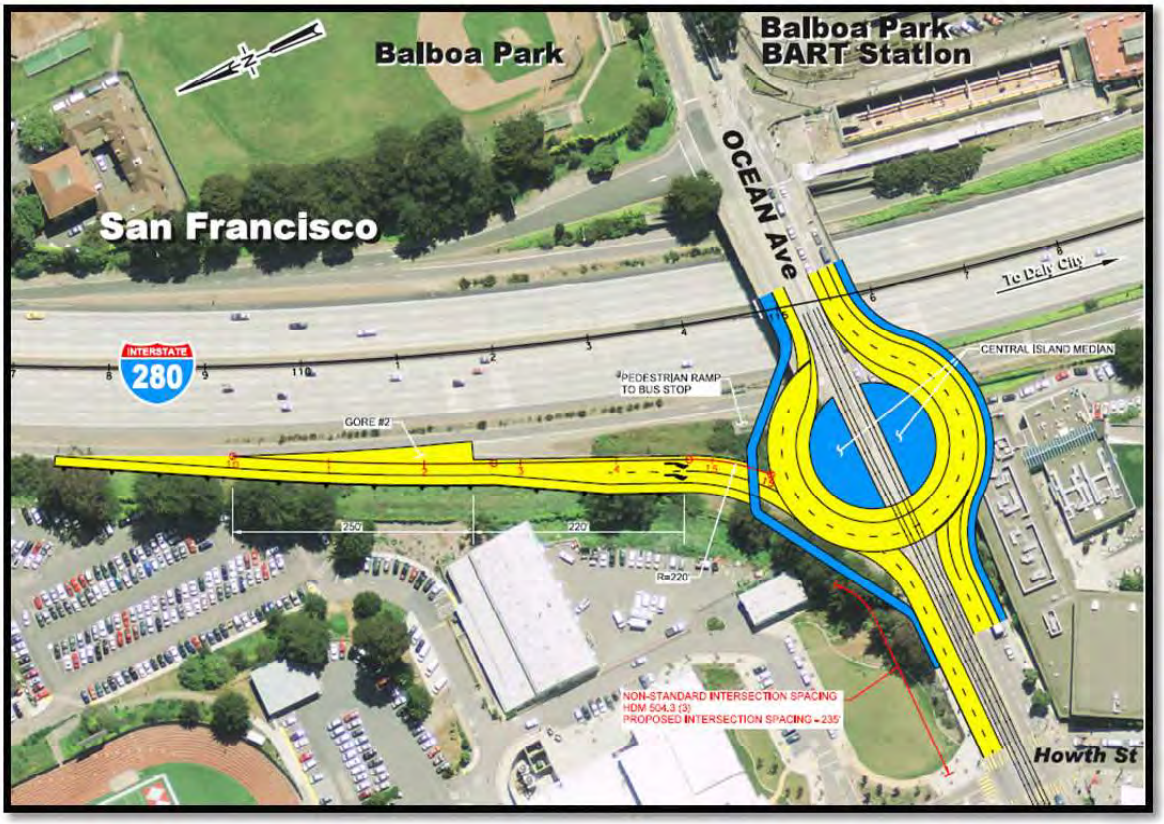
The implementation of stop sign intersection control is not practical due to the high I-280 southbound ramp volumes. According to the San Francisco Chained Activity Modeling Process (SF-CHAMP), The Average Annual Daily Traffic (AADT) is forecasted to be 56,917 vehicles entering the I-280 Southbound Off-Ramp/Ocean Avenue intersection for the Opening Year (2020). This volume is larger than the suggested threshold of 25,000 in the *ICE Process Informational Guide* for an all-way stop. While this option may improve the pedestrian and bicycle safety, the queues on the I-280 southbound off-ramp are likely to extend to the I-280 mainline and would cause impact to mainline operations and safety. For the reasons listed above, this potential solution concept is not viable and will be dropped from further consideration.

4.2 Yield Control (Roundabout)

The Roundabout alternative option is not feasible at this location due to right-of-way impacts, traffic operation, and light rail operation in the median. See attached Figure 1 for the roundabout alternative layout. The roundabout design not only impacts the light rail operations in the median, it also introduces additional traffic movements that are not applicable to this

intersection. Further, the implementation of a roundabout would not improve pedestrian/bicycle safety. In addition to these drawbacks, this design would require additional right-of-way and property acquisition. For the reasons listed above, this potential solution concept is not viable and will be dropped from further consideration.

Figure 1: Roundabout Design Alternative Layout



4.3 Traffic Signalization

Utilization of a signal controlled intersection is a feasible alternative that will provide a controlled, safe crossing mechanism for pedestrians and eliminate the need for bicycles traveling westward on Ocean Avenue to merge with the I-280 southbound off-ramp vehicles. This alternative is both viable and practical in the project location and will be advanced for further consideration.

5.0 Step Two: Engineering Analysis

Based on the initial screening of alternatives, it is evident that a signalized intersection is the only viable and practical design alternative for the intersection at I-280 Southbound Off-Ramp/Ocean Avenue. Detailed analysis, including design performance checks and a comparison of the Build and No-Build scenarios is included in the *I-280 SB Off-Ramp Realignment Project at Balboa Park Traffic Operational Analysis Report*, dated 9/30/2016. According to the traffic operational analysis, signalized intersection design would meet the capacity and storage requirements, operations conditions, turning movements, and improve pedestrian and bicycle safety for Opening Year (2020) and Future Year (2040).

As described above, the yield control (roundabout) and multi-way stop control options are not a practical means of improving safety and the signal controlled option is the only viable alternative. Although the signal controlled alternative is the only viable option, a signal warrant analysis was performed. This analysis, performed in accordance with the Manual on Uniform Traffic Control Devices (MUTCD), determined that the installation of a traffic control signal satisfies Warrant 3 - Peak Hour, and therefore is appropriate in this location. See Attachment A for Signal Warrant Analysis.

Attachment A

Signal Warrant Analysis

Intersection of I-280 SB off-ramp and Ocean Avenue

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 2 of 5)

2020 Build Conditions

Major approach AM/PM Peak Hour Volume: 750vph/ 735vph
Minor approach AM/PM Peak Hour Volume: 275vph/ 270 vph
See Page 17 in Final TOAR.

WARRANT 2 - Four Hour Vehicular Volume — **SATISFIED* YES ☐ NO ☐**

Record hourly vehicular volumes for any four hours of an average day.

APPROACH LANES	One	2 or More				Hour
Both Approaches - Major Street						
Higher Approach - Minor Street						

*All plotted points fall above the applicable curve in Figure 4C-1. (URBAN AREAS)	Yes ☐ No ☐
OR, All plotted points fall above the applicable curve in Figure 4C-2. (RURAL AREAS)	Yes ☐ No ☐

WARRANT 3 - Peak Hour — **SATISFIED YES ☒ NO ☐**
(Part A or Part B must be satisfied)

PART A — **SATISFIED YES ☒ NO ☐**

(All parts 1, 2, and 3 below must be satisfied for the same one hour, for any four consecutive 15-minute periods)

AM Peak: [289 veh x 70.8sec x 1/3600 hr/sec] = 5.68 veh-hours delay > 4 veh-hours delay
PM Peak: [284 veh x 64.9sec x 1/3600 hr/sec = 5.11 veh-hours delay > 4 veh-hours delay

1. The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; AND	Yes ☒ No ☐
2. The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND	Yes ☒ No ☐
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches.	Yes ☒ No ☐

AM Peak: 275 veh/hr > 100 veh/hr
PM Peak: 270 veh/hr > 100 veh/hr

**It should be noted that Peak Hour Factor of 0.95 are included in the calculation in part 1 vehicle-hours delay.*

AM Peak: 1025 veh/hr > 650 veh/hr
PM Peak: 1005 veh/hr > 650 veh/hr

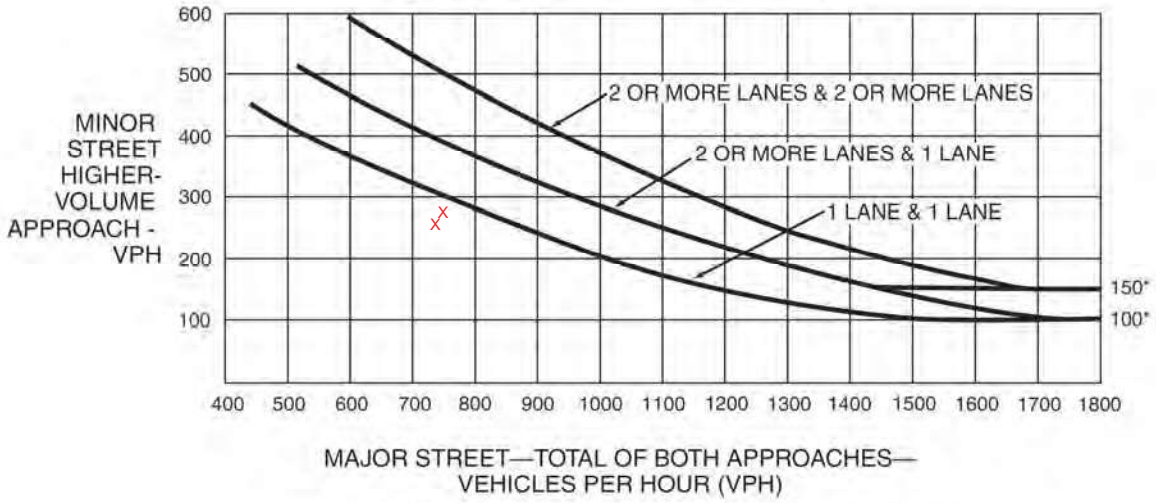
PART B — **SATISFIED YES ☐ NO ☒**

APPROACH LANES	One	2 or More	AM Peak Hour	PM Peak Hour
Both Approaches - Major Street		X	750	735
Higher Approach - Minor Street	X		275	270

The plotted point falls above the applicable curve in Figure 4C-3. (URBAN AREAS)	Yes ☐ No ☒
OR, The plotted point falls above the applicable curve in Figure 4C-4. (RURAL AREAS)	Yes ☐ No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

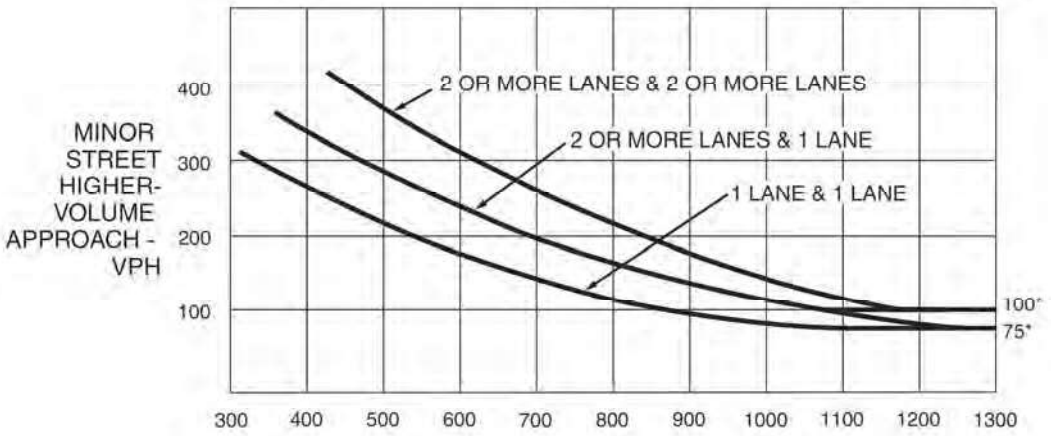
Figure 4C-3. Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)

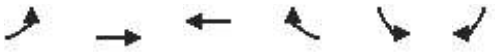


*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	275	0	0	750
Future Volume (Veh/h)	0	0	275	0	0	750
Sign Control		Stop	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	289	0	0	789
Pedestrians		24				
Lane Width (ft)		0.0				
Walking Speed (ft/s)		3.5				
Percent Blockage		0				
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	168	24	813	0	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	168	24	813	0	0	
tC, single (s)	7.1	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.5	4.0	4.0	3.3	2.2	
p0 queue free %	100	100	8	100	100	
cM capacity (veh/h)	151	869	313	1085	1623	

Direction, Lane #	WB 1	SB 1	SB 2
Volume Total	289	394	394
Volume Left	0	0	0
Volume Right	0	394	394
cSH	313	1700	1700
Volume to Capacity	0.92	0.23	0.23
Queue Length 95th (ft)	226	0	0
Control Delay (s)	70.8	0.0	0.0
Lane LOS	F		
Approach Delay (s)	70.8	0.0	
Approach LOS	F		

Intersection Summary			
Average Delay	19.0		
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	275	0	0	750
Future Volume (Veh/h)	0	0	275	0	0	750
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	289	0	0	789
Pedestrians		24				
Lane Width (ft)		0.0				
Walking Speed (ft/s)		3.5				
Percent Blockage		0				
Right turn flare (veh)						14
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		300	300			
pX, platoon unblocked						
vC, conflicting volume	289				289	313
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	289				289	313
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	0
cM capacity (veh/h)	1273				702	727

Direction, Lane #	WB 1	SB 1
Volume Total	289	789
Volume Left	0	0
Volume Right	0	789
cSH	1700	0
Volume to Capacity	0.17	Err
Queue Length 95th (ft)	0	Err
Control Delay (s)	0.0	Err
Lane LOS		F
Approach Delay (s)	0.0	Err
Approach LOS		F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	270	0	0	735
Future Volume (Veh/h)	0	0	270	0	0	735
Sign Control		Stop	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	284	0	0	774
Pedestrians		30				
Lane Width (ft)		0.0				
Walking Speed (ft/s)		3.5				
Percent Blockage		0				
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	172	30	804	0	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	172	30	804	0	0	
tC, single (s)	7.1	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.5	4.0	4.0	3.3	2.2	
p0 queue free %	100	100	10	100	100	
cM capacity (veh/h)	179	863	316	1085	1623	

Direction, Lane #	WB 1	SB 1	SB 2
Volume Total	284	387	387
Volume Left	0	0	0
Volume Right	0	387	387
cSH	316	1700	1700
Volume to Capacity	0.90	0.23	0.23
Queue Length 95th (ft)	212	0	0
Control Delay (s)	64.9	0.0	0.0
Lane LOS	F		
Approach Delay (s)	64.9	0.0	
Approach LOS	F		

Intersection Summary			
Average Delay	17.4		
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	270	0	0	735
Future Volume (Veh/h)	0	0	270	0	0	735
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	284	0	0	774
Pedestrians		30				
Lane Width (ft)		0.0				
Walking Speed (ft/s)		3.5				
Percent Blockage		0				
Right turn flare (veh)						14
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		300	300			
pX, platoon unblocked						
vC, conflicting volume	284				284	314
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	284				284	314
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	0
cM capacity (veh/h)	1278				706	726

Direction, Lane #	WB 1	SB 1
Volume Total	284	774
Volume Left	0	0
Volume Right	0	774
cSH	1700	0
Volume to Capacity	0.17	Err
Queue Length 95th (ft)	0	Err
Control Delay (s)	0.0	Err
Lane LOS		F
Approach Delay (s)	0.0	Err
Approach LOS		F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		

Existing Conditions - Signal Warrant Summary

Signal Warrant	Satisfied (Yes/No)
Warrant 1, Eight-Hour Vehicular Volume	No
Warrant 2, Four-Hour Vehicular Volume	No
Warrant 3, Peak Hour *	No
Warrant 4, Pedestrian Volume	No
Warrant 5, School Crossing	-
Warrant 6, Coordinated Signal System	-
Warrant 7, Crash Experience	-
Warrant 8, Roadway Network	-
Warrant 9, Intersection Near a Grade Crossing	-

"-" Not applicable or insufficient data for the analysis

** It should be noted that total vehicle delay under Part A of Warrant 3 were not performed due to the intersection unique control under Existing Conditions. The Warrant 3 was recommended to be evaluated for 2020 Build Conditions.*

Intersection of I-280 SB off-ramp and Ocean Avenue

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 1 of 5)

4	SF	I-280	
DIST	CO	RTE	PM

COUNT DATE 05/06/2015
CALC _____ DATE _____
CHK _____ DATE _____

Major St: I-280 SB off-ramp — Critical Approach Speed 25 mph
Minor St: Ocean Avenue — Critical Approach Speed 25 mph

Speed limit or critical speed on major street traffic > 40 mph..... ☐
or
In built up area of isolated community of < 10,000 population..... ☐ } RURAL (R)
☒ URBAN (U)

WARRANT 1 - Eight Hour Vehicular Volume SATISFIED YES ☐ NO ☒
(Condition A or Condition B or combination of A and B must be satisfied)

Condition A - Minimum Vehicle Volume 100% SATISFIED YES ☐ NO ☒
80% SATISFIED YES ☐ NO ☐

	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)			
	U	R	U	R
APPROACH LANES	1		2 or More	
Both Approaches Major Street	500 (400)	350 (280)	600 (480)	420 (336)
Highest Approach Minor Street	150 (120)	105 (84)	200 (160)	140 (112)

Hour

Calculations next pages ---->

Condition B - Interruption of Continuous Traffic 100% SATISFIED YES ☐ NO ☒
80% SATISFIED YES ☐ NO ☐

	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)			
	U	R	U	R
APPROACH LANES	1		2 or More	
Both Approaches Major Street	750 (600)	525 (420)	900 (720)	630 (504)
Highest Approach Minor Street	75 (60)	53 (42)	100 (80)	70 (56)

Hour

Combination of Conditions A & B SATISFIED YES ☐ NO ☒

REQUIREMENT	CONDITION	✓	FULFILLED
TWO CONDITIONS SATISFIED 80%	A. MINIMUM VEHICULAR VOLUME		Yes ☐ No ☒
	AND, B. INTERRUPTION OF CONTINUOUS TRAFFIC		
AND, AN ADEQUATE TRIAL OF OTHER ALTERNATIVES THAT COULD CAUSE LESS DELAY AND INCONVENIENCE TO TRAFFIC HAS FAILED TO SOLVE THE TRAFFIC PROBLEMS			Yes ☒ No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Intersection of I-280 SB off-ramp and Ocean Avenue

Table 4C-1. Warrant 1, Eight-Hour Vehicular Volume

Condition A—Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1	1	500	400	350	280	150	120	105	84
2 or more	1	600	480	420	336	150	120	105	84
2 or more	2 or more	600	480	420	336	200	160	140	112
1	2 or more	500	400	350	280	200	160	140	112

Condition B—Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1	1	750	600	525	420	75	60	53	42
2 or more	1	900	720	630	504	75	60	53	42
2 or more	2 or more	900	720	630	504	100	80	70	56
1	2 or more	750	600	525	420	100	80	70	56

[a] Basic minimum hourly volume
[b] Used for combination of Conditions A and B after adequate trial of other remedial measures
[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
[d] May be used for combination of Conditions A and B after adequate trial of other remedial measures when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Detailed Calculations ---->

I-280 Balboa Project
Peak Period - Hourly Volume

Hour	I-280 SB Off-Ramp SB	I-280 SB Off-Ramp *Ped Volume*	Ocean Avenue EB*	Ocean Avenue WB	Signal Warrant 1 - Eight-Hour Vehicular Volume: Condition A - Mininum Vehicular Volume (Volume Thresholds) (100%[a]) Major St (1 Lane)	Condition A Minor St (1 Lane)	Volume Threshold Met?	Condition B - Interruption of Continuous Traffic Major St (1 Lane)	Condition B Minor St (1 Lane)	Volume Threshold Met?
6:00 AM - 7:00 AM	211	*3*	348	96	500	150	No	750	75	No
6:15 AM - 7:15 AM	275	*3*	441	157	500	150	No	750	75	No
6:30 AM - 7:30 AM	361	*3*	565	206	500	150	No	750	75	No
6:45 AM - 7:45 AM	443	*7*	699	202	500	150	No	750	75	No
7:00 AM - 8:00 AM	477	*21*	846	228	500	150	No	750	75	No
7:15 AM - 8:15 AM	503	*24*	934	208	500	150	Yes	750	75	No
7:30 AM - 8:30 AM	490	*28*	943	208	500	150	No	750	75	No
7:45 AM - 8:45 AM	462	*33*	901	264	500	150	No	750	75	No
8:00 AM - 9:00 AM	468	*26*	816	242	500	150	No	750	75	No
8:15 AM - 9:15 AM	461	*29*	747	234	500	150	No	750	75	No
8:30 AM - 9:30 AM	463	*35*	705	225	500	150	No	750	75	No
8:45 AM - 9:45 AM	474	*35*	667	180	500	150	No	750	75	No
9:00 AM - 10:00 AM	473	*32*	654	160	500	150	No	750	75	No
9:15 AM - 10:15 AM	477	*34*	618	130	500	150	No	750	75	No
9:30 AM - 10:30 AM	456	*25*	589	122	500	150	No	750	75	No
9:45 AM - 10:45 AM	428	*19*	590	147	500	150	No	750	75	No
10:00 AM - 11:00 AM	419	*20*	600	183	500	150	No	750	75	No
3:00 PM - 4:00 PM	552	*25*	796	142	500	150	No	750	75	No
3:15 PM - 4:15 PM	536	*25*	822	176	500	150	Yes	750	75	No
3:30 PM - 4:30 PM	529	*20*	797	150	500	150	Yes	750	75	No
3:45 PM - 4:45 PM	536	*25*	781	109	500	150	No	750	75	No
4:00 PM - 5:00 PM	533	*26*	742	124	500	150	No	750	75	No
4:15 PM - 5:15 PM	560	*24*	774	100	500	150	No	750	75	No
4:30 PM - 5:30 PM	566	*30*	786	106	500	150	No	750	75	No
4:45 PM - 5:45 PM	535	*22*	789	162	500	150	Yes	750	75	No
5:00 PM - 6:00 PM	493	*30*	810	173	500	150	No	750	75	No
5:15 PM - 6:15 PM	429	*35*	803	234	500	150	No	750	75	No
5:30 PM - 6:30 PM	385	*33*	752	295	500	150	No	750	75	No
5:45 PM - 6:45 PM	344	*33*	707	318	500	150	No	750	75	No
6:00 PM - 7:00 PM	363	*24*	692	328	500	150	No	750	75	No
6:15 PM - 7:15 PM	397	*16*	629	262	500	150	No	750	75	No
6:30 PM - 7:30 PM	403	*12*	616	195	500	150	No	750	75	No
6:45 PM - 7:45 PM	441	*8*	620	108	500	150	No	750	75	No
7:00 PM - 8:00 PM	432	*4*	578	95	500	150	No	750	75	No
Data Collected Wednesday, May 6,2015					Total of Hours Meet Volume Thresholds		4	Total of Hours Meet Volume Thresholds		0
					Warrant 1 - Met?		NO	Warrant 1 - Met?		NO

* Not included as this movement is separated by LRT in the center median and not conficting with other movements.

[a] - Basic minimum hourly volume

Intersection of I-280 SB off-ramp and Ocean Avenue

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 2 of 5)

WARRANT 2 - Four Hour Vehicular Volume — **SATISFIED* YES ☐ NO ☒**

Record hourly vehicular volumes for any four hours of an average day.

APPROACH LANES	One	2 or More	7:00-8:00 AM	7:15-8:15 AM	4:30-5:30 PM	6:00-7:00 PM
Both Approaches - Major Street	X		477	503	566	363
Higher Approach - Minor Street	X		228	208	106	328

*All plotted points fall above the applicable curve in Figure 4C-1. (URBAN AREAS)	Yes ☐	No ☒
OR, All plotted points fall above the applicable curve in Figure 4C-2. (RURAL AREAS)	Yes ☐	No ☐

WARRANT 3 - Peak Hour — **SATISFIED YES ☐ NO ☒**
(Part A or Part B must be satisfied)

PART A — **SATISFIED YES ☐ NO ☒**

(All parts 1, 2, and 3 below must be satisfied for the same one hour, for any four consecutive 15-minute periods)

1. The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; AND	Yes ☐	No ☒
2. The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND	Yes ☒	No ☐
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches.	Yes ☒	No ☐

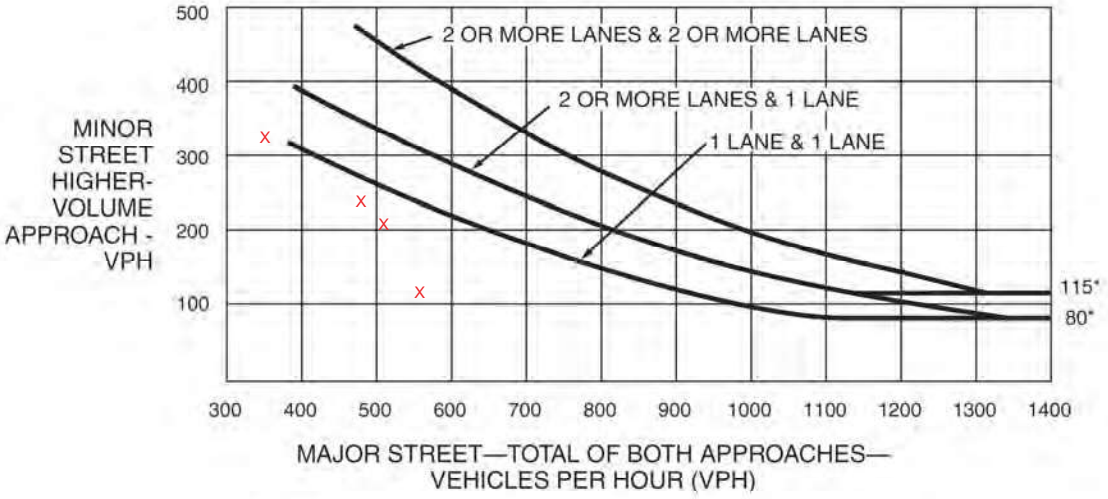
PART B — **SATISFIED YES ☐ NO ☒**

APPROACH LANES	One	2 or More	AM Peak Hour	PM Peak Hour
Both Approaches - Major Street	X		503	363
Higher Approach - Minor Street	X		208	328

The plotted point falls above the applicable curve in Figure 4C-3. (URBAN AREAS)	Yes ☐	No ☒
OR, The plotted point falls above the applicable curve in Figure 4C-4. (RURAL AREAS)	Yes ☐	No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

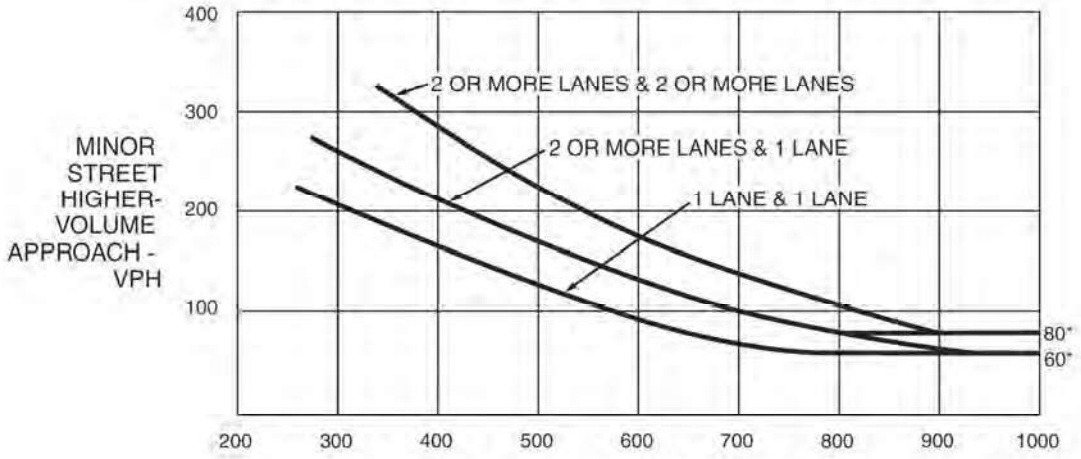
Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume



*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



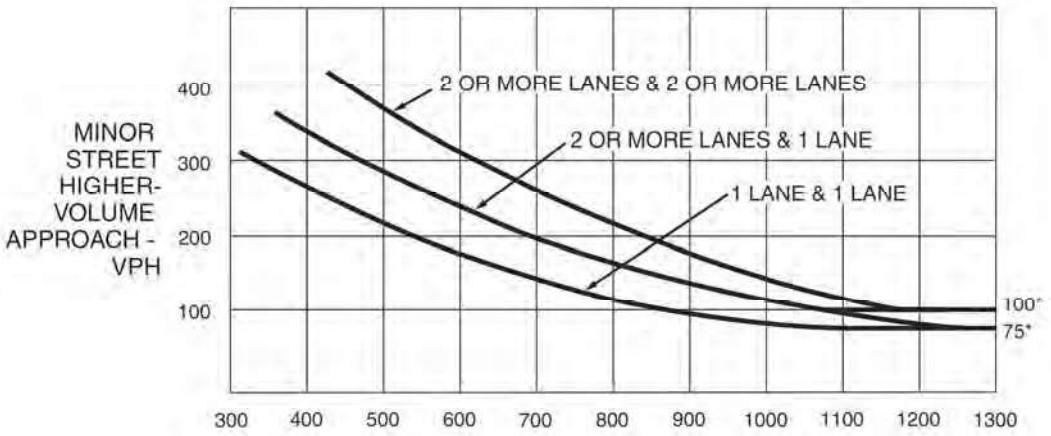
*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-3. Warrant 3, Peak Hour

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Intersection of I-280 SB off-ramp and Ocean Avenue

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 3 of 5)

WARRANT 4 - Pedestrian Volume
(Parts 1 and 2 Must Be Satisfied)

SATISFIED YES ☐ NO ☒

Part 1 (Parts A or B must be satisfied)

	Hours - - ->	8:45-9:45 AM	9:15-10:15 AM	3:00-4:00 PM	4:30-5:30 PM
A.	Vehicles per hour for any 4 hours	474	477	552	566
	Pedestrians per hour for any 4 hours	35	34	25	30

Figure 4C-5 or Figure 4C-6
SATISFIED YES ☐ NO ☒

	Hours - - ->	8:45-9:45 AM	9:15-10:15 AM	3:00-4:00 PM	4:30-5:30 PM
B.	Vehicles per hour for any 1 hour	474	477	552	566
	Pedestrians per hour for any 1 hour	35	34	25	30

Figure 4C-7 or Figure 4C-8
SATISFIED YES ☐ NO ☒

Part 2 SATISFIED YES ☐ NO ☒

AND, The distance to the nearest traffic signal along the major street is greater than 300 ft	Yes ☐	No ☒
OR, The proposed traffic signal will not restrict progressive traffic flow along the major street.	Yes ☒	No ☐

WARRANT 5 - School Crossing
(Parts A and B Must Be Satisfied) N/A

SATISFIED YES ☐ NO ☐

Part A
Gap/Minutes and # of Children

SATISFIED YES ☐ NO ☐

		Hour
Gaps vs Minutes	Minutes Children Using Crossing	
	Number of Adequate Gaps	
School Age Pedestrians Crossing Street / hr		

Gaps < Minutes YES ☐ NO ☐
AND Children > 20/hr YES ☐ NO ☐

AND, Consideration has been given to less restrictive remedial measures.	Yes ☐	No ☐

Part B SATISFIED YES ☐ NO ☐

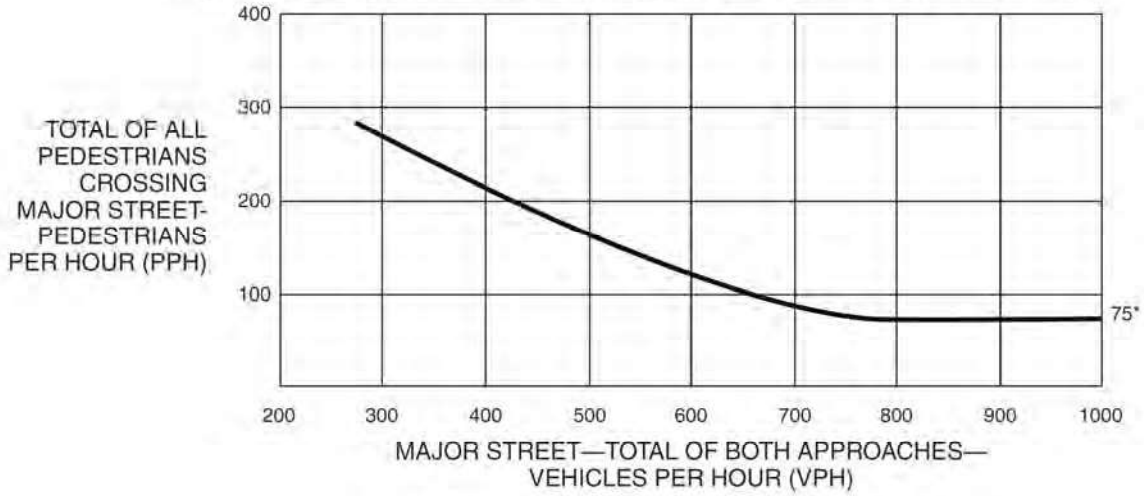
The distance to the nearest traffic signal along the major street is greater than 300 ft	Yes ☐	No ☐
OR, The proposed signal will not restrict the progressive movement of traffic.	Yes ☐	No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-5. Warrant 4, Pedestrian Four-Hour Volume

*Note: 107 pph applies as the lower threshold volume.

Figure 4C-6. Warrant 4, Pedestrian Four-Hour Volume (70% Factor)

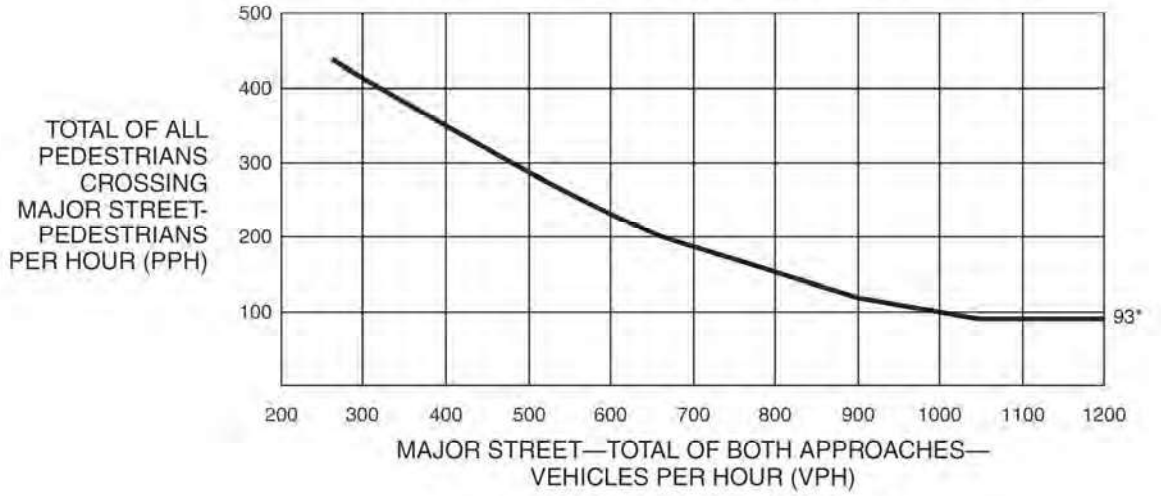


*Note: 75 pph applies as the lower threshold volume.

Figure 4C-7. Warrant 4, Pedestrian Peak Hour

*Note: 133 pph applies as the lower threshold volume.

Figure 4C-8. Warrant 4, Pedestrian Peak Hour (70% Factor)



*Note: 93 pph applies as the lower threshold volume.

ATTACHMENT J
Environmental Document
CEQA Categorical Exemption

San Francisco County Transportation Authority

1455 Market Street, 22ND Floor, San Francisco, California 94103 415-522-4800 info@sfcta.org www.sfcta.org

CEQA CATEGORICAL EXCLUSION DETERMINATION

Project Location/Address: Ocean Avenue off-ramp from southbound Interstate 280 (I-280), San Francisco, California. PM 1.77/1.95

Project/Activity Description: Please see attached sheets

CEQA Compliance: Based on an examination of this proposal, supporting information, and the following statements (See 14 CCR 15300 et seq.):

- This project does not impact an environmental resource of hazardous or critical concern where designated, precisely mapped, and officially adopted pursuant to law.
- There will not be a significant cumulative effect by this project and successive projects of the same type in the same place, over time.
- There is not a reasonable possibility that the project will have a significant effect on the environment due to unusual circumstances.
- This project does not damage a scenic resource within an officially designated state scenic highway.
- This project is not located on a site included on any list compiled pursuant to Govt. Code § 65962.5 ("Cortese List").
- This project does not cause a substantial adverse change in the significance of a historical resource.

San Francisco County Transportation Authority CEQA Determination

☐ Exempt by Statute. (PRC 21080[b]; 14 CCR 15260 et seq.)

Based on an examination of this proposal, supporting information, and the above statements, the project is:

☒ Exempt. Class 2. (PRC 21084; 14 CCR 15300 et seq.)

☐ Categorically Exempt. General Rule exemption. [This project does not fall within an exempt class, but it can be seen with certainty that there is no possibility that the activity may have a significant effect on the environment (CCR 15061[b][3])

T Chang 7/9/2020 Eric M. Cordoba 7/9/2020

Tilly Chang, Executive Director SFCTA Date Eric Cordoba, Deputy Director for Capital Project Date

1.0 Introduction

San Francisco County Transportation Authority (SFCTA) in cooperation with the California Department of Transportation (Caltrans) proposes to modify the existing southbound I-280 off-ramp to Ocean Avenue and Geneva Avenue. The current configuration of the southbound I-280 off-ramp is a single lane free right turn onto Ocean Avenue, and a continuation of the ramp to Geneva Avenue. This memo describes the proposed project and provides supporting documentation that the proposed project is categorically exempt from the California Environmental Quality Act (CEQA) pursuant to Section 15301 of the CEQA Guidelines.

A variety of design alternatives were recommended for consideration at the intersection and were assessed for viability and practicality. The consideration of innovative access strategies such as traffic signal systems, multi-way stop control, and yield control (Roundabouts) was evaluated. Each design alternative was screened based on a variety of design parameters including, but not limited to: safety, traffic operations, right-of-way implications, and environmental and cultural impacts. This memorandum will provide a brief description of off-ramp realignment design alternatives, initial screening, and recommendations based on the Caltrans ICE guidelines dated August 2013.

2.0 Project Description

Two alternatives are under consideration for modifications to the Ocean Avenue Off-Ramp; a No-Build Alternative and a Build Alternative. These two alternatives are described below:

1. No Build – Alternative 1

The No Build Alternative proposes no modifications to the existing I-280 configuration other than routine maintenance and rehabilitation and the currently planned and programmed projects within the area.

2. Build – Alternative 2

The Build Alternative includes modifications to the existing southbound I-280 off-ramp at Ocean Avenue. The Build Alternative includes the following components (see Figure 1):

- Elimination of the existing free-right turn lane for vehicles exiting the southbound I-280 off-ramp just prior to the Ocean Avenue/Howth Street intersection,
- Realignment and widening of the existing Ocean Avenue off-ramp to a two-lane T-intersection at Ocean Avenue; and
- Installation of a traffic signal at the realigned southbound I-280 off-ramp/Ocean Avenue intersection to provide controlled crossing for pedestrians and bicyclists.

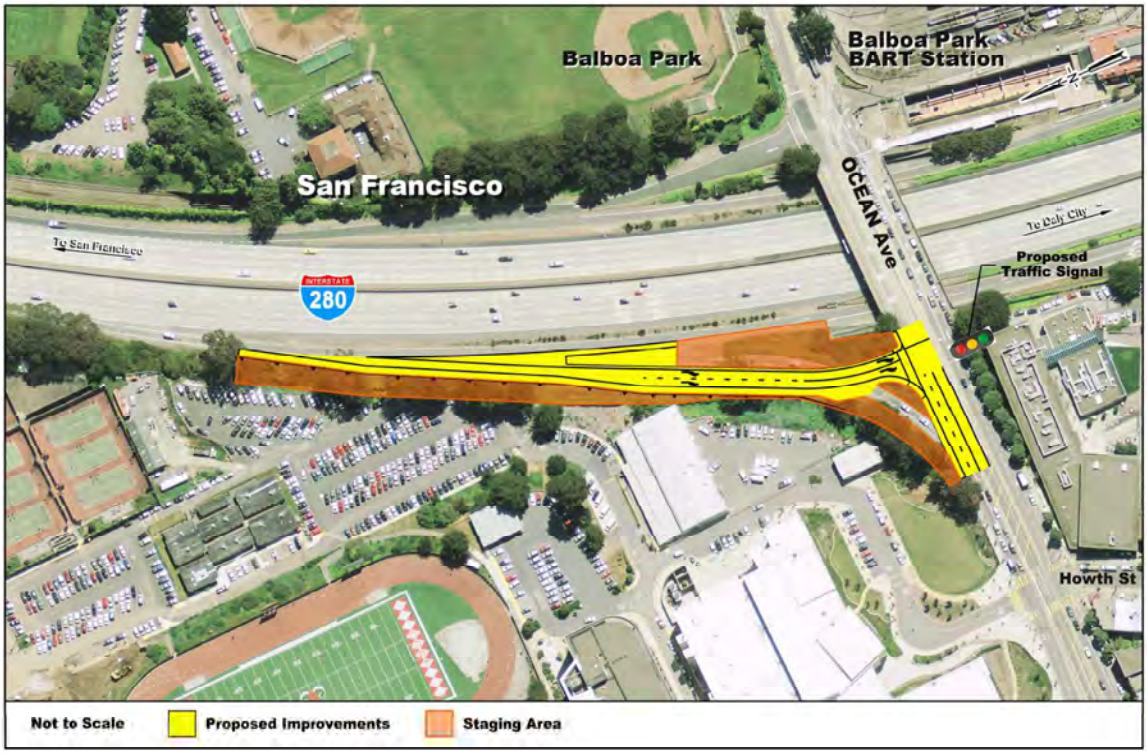
The realignment and widening of the existing southbound I-280 off-ramp at Ocean Avenue to two lanes would require the construction of a retaining wall approximately 700 feet long with a maximum height of 20 feet. Construction of the retaining wall would require excavation to a maximum depth of 25 feet. All roadway components would be constructed within existing State right-of-way. A temporary construction easement (TCE) of approximately up to 20 feet by 200 feet and an underground easement for retaining wall tie backs and/or retaining wall foundations may be required along the western side of the existing ramp. Tiebacks would extend below footprint of the existing San Francisco City College (CCSF) building, but the design will minimize any impacts. All activity would take place within existing Caltrans right-of-way.

3.0 Construction Methodology

The Project duration would be approximately 12 months. Construction of the proposed improvements would include installation of a retaining wall along the west side of the realigned off ramp. Installation of a shoring system will be required to facilitate construction of the permanent wall and excavation of the existing soil embankment material. Temporary shoring wall systems that could be utilized include steel sheet pile and ground anchor, and retaining wall alternatives include Type 1, Ground Anchor, and Soldier Pile. Pile driving will likely be necessary during construction, and will vary depending on the permanent wall type and/or the shoring alternative selected by the contractor.

The removal of up to five trees and some low laying vegetation would be necessary to facilitate the realignment of the off-ramp and the construction of the retaining wall. Restoration of landscaped features along the right of way would occur after completion of the retaining wall and off-ramp realignment. Construction equipment that would be used includes: excavator, dump trucks, paver machines, grader, roller, and concrete trucks. Potential staging areas for construction materials and equipment are shown in Figure 1.

Figure 1- Proposed Improvements and Staging Area



To ensure that traffic operations are not impacted during construction, the construction sequences would be phased to preserve existing lane capacity and movements. The construction staging concept for the proposed ramp realignment includes the four unique stages described below.

Stage 1

a) Install traffic signal components at intersection and overhead electrical work for SF Muni Light Rail.

b) Widen existing Ocean Avenue along the north side from the proposed T-intersection location to the existing off-ramp intersection with Ocean Avenue.

c) Construct the T-intersection portion of the off-ramp while maintaining current ramp traffic.

Stage 2

a) Construct retaining wall and number two lane of proposed ramp along the west side of the existing off-ramp.

b) Place overlay along existing pavement up to finished grade between new roadway sections constructed in Stage 1c and Stage 2a. This stage would require night time closure of the existing off-ramp for up to three nights. Advanced notification of ramp closures would be posted and temporary detours would be established as part of the construction traffic management plan.

c) Shift traffic off of existing ramp and onto new roadway sections constructed in stages 1c, 2a, and 2b.

Stage 3

a) Remove existing ramp and construct remaining portion of proposed off-ramp, including the number one lane, shoulder, gore area, and barrier.

b) Place overlay along existing pavement up to finished grade between new roadway sections constructed in Stage 1c and Stage 3a.

Stage 4

a) Construct final pavement layer and striping and signing work. Stage 4 would require night time closure of the existing off-ramp for up to three nights. Advanced notification of ramp closures would be posted and temporary detours would be established as part of the construction traffic management plan to be adopted for the project. During night time ramp closure periods, traffic can utilize the Geneva off-ramp and/or Monterey off-ramp for detour routes.

b) Install landscape planting at areas that have been affected by construction activity.

4.0 Purpose and Need

The purpose of this project is to improve safety along Ocean Avenue at the southbound I-280 off-ramp intersection.

The current configuration of the southbound I-280 off-ramp intersection with Ocean Avenue creates potential conflicts between multi-modal users.

The current configuration of the southbound I-280 off-ramp is a single lane, free-right turn onto westbound Ocean Avenue just prior to the intersection with Howth Street. The ramp becomes a new rightmost lane as it joins westbound Ocean Avenue. Vehicles on westbound Ocean Avenue that are attempting to shift to the right lane immediately past the ramp merge area to turn right at Howth Street into San Francisco City College are required to merge with vehicles exiting the off-ramp over a short distance of approximately 150 feet.

The project area supports a high volume of pedestrian traffic due to the vicinity of the Balboa Park BART and Muni stations. Additionally, there are pedestrian destinations within the vicinity of the Balboa Park neighborhood, such as the San Francisco City College, Lick-Wilmerding High School, Balboa Park, and neighborhood retail along Ocean Avenue to the west of the college. The current ramp configuration requires pedestrians traveling along the northern side of Ocean Avenue to cross the southbound I-280 off-ramp at an uncontrolled crosswalk where vehicles exit the freeway at high speeds.

Ocean Avenue is the primary east-west bicycle route in the area, with a mix of Class II bike lanes and Class III bicycle routes in each direction. The San Francisco Municipal Transportation Agency's (SFMTA) draft multi-modal

hierarchy[1] identifies this segment of Ocean Avenue as a highest priority segment of the bicycle network, based on demand and hilliness. The current ramp configuration requires westbound cyclists attempting to stay in the rightmost lane to merge into the lane populated by vehicles exiting the freeway at high speeds.

According to the San Francisco Department of Public Health (SFDPH) TransBASE database, between 2005-2015 there were two pedestrian injuries, four bicycle injuries, and six vehicle injuries in the area at the intersection of Ocean/SB I-280/Howth.[2] This intersection has been identified as a "High Injury Intersection" in San Francisco's Vision Zero Action Strategy.[3]

This segment of Ocean Avenue has also been identified as part of the Vision Zero "High Injury Network," and is specifically a high injury corridor for cyclists. The Vision Zero Action Strategy calls for redesign of corridors & intersections with treatments to increase safety and reduce fatal crashes by improving visibility, calming traffic speeds, and encouraging road user compliance. Furthermore, the intersection displays several of the issues identified by the Caltrans Complete Intersections Guide4 as affecting free-flow ramps, including motorists traveling at high speed and unlikely to yield, acute intersection angle limiting visibility, and bicyclists forced to weave. This guide recommends a T-intersection as one of the top recommended treatments to improve multi-modal safety.

The current configuration of the southbound I-280 off-ramp is a single lane, free merge onto westbound Ocean Avenue just prior to the intersection with Howth Street. Vehicles on westbound Ocean Avenue that are attempting to turn right at Howth Street into San Francisco City College are required to weave into the right lane with vehicles exiting the off-ramp, over a short distance of approximately 150 feet. Westbound cyclists on Ocean Avenue must also merge into the off-ramp receiving lane to continue on Ocean Avenue. Pedestrians along the northern sidewalk of Ocean Avenue must cross the off-ramp at a crosswalk that has minimal sign control, stating "yield to pedestrians". Under existing conditions, westbound queues along Ocean Avenue extend from the Geneva Avenue/Phelan Avenue intersection to I-280 southbound off-ramp and continue back to the I-280 mainline. Within the project study limits, Ocean Avenue eastbound and westbound movements are separated by a wide median with light rail operation. Light rail vehicles get the signal priority at intersections along Ocean Avenue within the study area.

5.0 CEQA Determination

The project is categorically exempt from CEQA pursuant to Section 15301 of the CEQA Guidelines. Per the CEQA Guidelines, Section 15301 Existing Facilities:

"Class 1 consists of the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing public or private structures, facilities, mechanical equipment, or topographical features, involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination. The types of "existing facilities" itemized below are not intended to be all inclusive of the types of projects which might fall within Class 1. The key consideration is whether the project involves negligible or no expansion of an existing use. Examples include but are not limited to:

[1] Draft Multi-Modal Hierarchy. San Francisco Municipal Transportation Agency, 2016: not available online.

[2] TransBASE: Linking Transportation Systems to Our Health. San Francisco Department of Public Health, 2016: http://transbasesf.org/transbase/

[3] Vision Zero San Francisco Two-Year Action Strategy 2017-18. City and County of San Francisco, 2016: http://visionzerosf.org/about/two-year-action-strategy/

[4] Complete Intersections: A Guide to Reconstructing Intersections and Interchanges for Bicyclists and Pedestrians, Section 9.1. California Department of Transportation, 2010: http://www.dot.ca.gov/trafficops/ped/.

(c) Existing highways and streets, sidewalks, gutters, bicycle and pedestrian trails, and similar facilities (this includes road grading for the purpose of public safety)."

Aesthetics

This segment of I-280 in the project area is not recognized as a scenic corridor, nor is it an officially designated scenic highway.[5] Therefore, the project would not result in impacts to a designated scenic resource.

A Visual Impact Assessment (VIA) was prepared for the project following the guidance outlined in the publication *Visual Impact Assessment for Highway Projects* published by the Federal Highway Administration (FHWA) in March 1981.[6] As described in the VIA, the existing landscape in the project area is characterized by a sloped road cut with sparse ground cover and mature cypress trees at the perimeter. The project area is characterized by vegetated roadside slopes that transitions to shallower slopes as the ramp terminates at Ocean Avenue. The proposed retaining wall would allow the removal of the sloped areas and the addition of an extra car lane in the off-ramp. The existing sloped areas of the project corridor suffer erosion and vegetation loss and the proposed retaining wall would improve the overall character of the project corridor by correcting these deficiencies. At the intersection of the proposed off ramp and Ocean Avenue a group of cypress trees would be removed to realign the ramp, provide sufficient sight-distance for vehicle and pedestrian traffic, and to correct root intrusion problems caused by the cypress that is heaving the sidewalk.

Neighbors (people with views *to* the road) and *highway users* (people with views *from* the road) would not be affected by the project. The views to the project area would not be significantly altered and the views from the road, while altered, would not be inconsistent with the overall visual character of the I-280 corridor which has several large existing retaining walls. It is anticipated that the average response of all viewer groups would be moderate-low with the only anticipated concern being the removal of the group of cypress trees at Ocean Avenue.

The visual character of the project would be compatible with the existing visual character of the corridor. The addition of the proposed retaining wall will be consistent with the overall visual character of I-280 which traverses significant topographic features and regularly features retaining walls of a similar length, height, and character as is proposed. Scenic vistas and visual character of the project corridor would be unaltered and light and glare would not be altered. Tree removal for the project would not significantly alter the visual character or unity of the project area.

The following avoidance or minimization measures would be implemented to lessen visual impacts caused by the project.

1) Replacement highway planting will be provided in all areas of highway planting removal where Right of Way allows. Where replacement planting is not possible at the removal location, replacement will be provided in adjacent planting areas along the project corridor.

2) Replacement ground cover plantings: The existing plantings are failing in several areas and are also considered to be invasive weeds by the California Invasive Plant Council. Replacement plantings that are native and climate adapted species selected to be diverse in foliage texture and flowering would minimize the impact of the new construction and result in a lasting, resilient and visually appealing landscape.

3) Decorative treatment to the retaining wall: Texture and pattern may be added to the retaining wall to reduce the overall visual impact of the wall.

[5] http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/

[6] Caltrans/Merrill Morris Partners, 2017. *VISUAL IMPACT ASSESSMENT I-280 Southbound Ocean Avenue Off-Ramp Realignment Project*, September 7, 2017.

While highway users can be considered sensitive receptors for visual impacts, the project would not significantly alter the long-term visual character of the project area. Additionally, though the appearance of the site as viewed by motorists would be altered during the construction period, these impacts would be considered short-term effects. The temporarily disturbed areas of the site would be restored and revegetated upon completion of construction. As such, project would not result in impacts to the existing visual setting.

Air Quality

An Air Quality and Greenhouse Gas Technical Memorandum was prepared for this project by AECOM.[7] This memorandum analyzed the potential air quality and greenhouse gas impacts associated with the construction and implementation of the project. Since the project would not increase or decrease the capacity of the current off-ramp, operational emissions levels would not differ as compared to the existing conditions at the project site. Therefore, the air quality and greenhouse gas memorandum focused on the potential impacts related to the construction activities.

During the construction phase, the project would generate temporary emissions of criteria air pollutants, causing short-term air quality impacts. Emissions would be generated by heavy construction equipment, material-hauling trucks, and construction-worker vehicles. This increase in emissions would be temporary and generally confined to the construction site and access roadways. According to the technical memorandum, the construction-related emissions of criteria air pollutants would remain below applicable *de minimis* thresholds over the course of the project. Therefore, the project would only result in short-term minor adverse air quality effects. According to AECOM's greenhouse gas emission estimates, the project would not exceed BAAQMD thresholds of significance. As a result, the project would not result in a significant impact related to air quality or greenhouse gases.

Biological Resources

A Natural Environment Study (Minimal Impact) (NES-MI) was prepared for the project in compliance with the Caltrans Standard Environmental Reference (SER).[8] As part of the NES-MI, a biological study area (BSA) was established to encompass the project limits and immediately adjacent locations with a buffer established to cover any potential habitat for special-status species. In addition, the BSA was surveyed for botanical and wildlife resources.

Within the BSA, most of the vegetation is limited to ornamental plantings or ruderal vegetation. Most of the adjacent lands are also developed, including the CCSF, which has a small grass lawn surrounded by ornamental plantings.

The NES-MI determined that there were no state or federal wetlands or waters and no special-status plant species present in the BSA. However, the NES-MI determined that the American peregrine falcon (Federally Delisted and Fully Protected status in California) has the potential to nest within or near the BSA. Migratory birds also have the potential to nest in trees or structures within the BSA. In addition, tall trees, vegetation, and the Ocean Avenue overpass within the BSA could provide suitable roosting habitat for special-status bats, so the potential for the presence of bats within the BSA cannot be ruled out. Therefore, the following Avoidance and Minimization Measures (AMMs) will be implemented to prevent any potential impact to special-status species, roosting bats, and migratory birds, and to prevent the spread of invasive, non-native plant species:

Conduct Preconstruction Surveys and Implement Project Schedule Windows

[7] AECOM, 2017. *I-280 SB Ocean Ave Off-Ramp Realignment Project at Balboa Park Air Quality and Greenhouse Gas Technical Memo*, March.
[8] Caltrans, 2017. *Interstate 280 Interchange Modification at Balboa Park Natural Environment Study (Minimal Impact)*, October.

1) An approved biologist will conduct preconstruction surveys before any ground-disturbing activities occur at time intervals described in species-specific AMMs. Surveys will confirm that no occupied bird nests or bat roosts are present within the BSA.
2) If a protected species is discovered during construction within the BSAs, Caltrans will notify USFWS and/or CDFW immediately, and the qualified biologist will have the authority to stop all construction work on the site until the appropriate corrective measures have been conducted, and it is determined that the animal will not be harmed.
3) If active or roosts are nests are discovered, buffer zones around will be established in coordination with the USFWS and CDFW. Construction activity shall be prohibited within the buffer zones until the young have fledged or the nest fails. Nests shall be monitored at least twice per week and a status report submitted monthly.
4) For protected resources and species, construction activity will be scheduled to avoid impacts to listed species and habitats to the extent practicable

During the breeding season, the following AMMs are required to prevent impacts to special status birds and bats:

1) Preconstruction surveys for nesting birds will be conducted by a qualified biologist no more than 72 hours prior to commencing construction activities. Surveys will cover any potential nesting substrates within 300 feet of construction activity.

2) If an active nest is observed either during preconstruction surveys or in the course of project construction, a non-disturbance buffer will be established 300 feet around active raptor nests, or 50 feet around active passerine nests, or larger if necessary to eliminate the effects of the disturbance on the nesting birds. If any work is proposed to occur within established buffer zones, a nest monitoring plan must be prepared and approved by Caltrans' Office of Biological Sciences and Permits.

3) No more than 2 weeks prior to tree removal, a qualified biologist will conduct a preconstruction survey of trees with 12 inches or greater diameter at breast height (dbh) for crevices and cavities that can provide bat roosting habitat or support active roosts. If potential roosting habitat or active roosts are identified, the project will implement AMMs determined in consultation with CDFW.

Any potential permanent or temporary impacts to bat species will be avoided with the incorporation of preconstruction surveys and any necessary AMMs. No more than 2 weeks prior to tree removal, a qualified biologist will conduct a preconstruction survey of trees with 12 inches or greater diameter at breast height (dbh) for crevices and cavities that can provide roosting habitat or support active roosts. If potential roosting habitat or active roosts are identified, the project will implement AMMs determined in consultation with CDFW.

Tree impacts anticipated for the project include three Monterey cypress trees located in between the Ocean Avenue and Geneva Avenue off-ramps, adjacent to the westbound lane of Ocean Avenue, as well as another Monterey cypress and two Monterey pine trees located on the vegetated slope adjacent to the Ocean Avenue off-ramp. The Monterey cypress trees that will be removed are 10, 17, 27, and 80 dbh, and the two Monterey pine trees that will be removed are 24 and 18 dbh. The following AMMs will be implemented prior to tree removal

1) Tree removal or alterations will be avoided wherever possible.

2) In order to minimize impacts to nesting bird habitat, for removal of trees within Caltrans right-of-way, the goal of landscaping will be to replace native trees at a 1:1 ratio. Trees will be replaced in-kind or with trees from other native species; they will be planted close to the original removal location is possible, or, at a minimum, within the same county.

3) Outreach to property owners is ongoing to obtain any necessary approvals for tree removals on private property.

For tree impacts within the City of San Francisco property, replacement requirements will be negotiated between Caltrans and the City of San Francisco permitting department, in accordance with the City of San Francisco Urban Forestry Ordinance Article 16 § 806.

Based on the above, Caltrans has determined that the project will have no effect on listed species, their habitats, or protected communities, provided that the required AMMs are followed. No adverse modification to any species critical habitat will occur as a result of project activities.

Cultural Resources

A Historic Property Survey Report (HPSR) was prepared for the project in compliance with the federal Section 106 process.[9] There are no prehistoric sites within the project Area of Potential Effects (APE), but there is one historic-era built environment resource in the APE; the Auxiliary Water Supply System (AWSS). However, the AWSS is located outside the subsurface vertical depth of the APE and thus the project would not affect this resource. The AWSS will be protected through the establishment of Environmentally Sensitive Areas (ESAs). As described in the ESA Action Plan prepared by AECOM for the project, the AWSS will be protected through the establishment of Environmentally Sensitive Areas (ESAs) that includes the necessary site-specific minimization measures to adequately protect the AWSS and identifies responsible parties and their roles related to historic resource protection, including the requirements for ESA monitoring. Construction contractors would be required to attend a preconstruction training to be informed about the ESAs. No ground disturbance would be planned in the vicinity of the AWSS.

A Paleontological Identification Report was prepared by AECOM to evaluate the likelihood of encountering paleontological resources within the project area.[10] A paleontological records search with the University of California Museum of Paleontology indicated that no paleontological resources have been previously been recorded within the project site. However, Pleistocene Colma Formation has the potential to contain paleontological resources. Based on a literature review, it is believed that Artificial Fill and Pleistocene Colma Formation contact may be within 25 feet below ground surface and thus paleontological resources may be encountered during grading operations. As a minimization measure, AECOM recommends to determine the contact depth between Artificial Fill and Pleistocene Colma Formation prior to grading and excavating for the retaining wall which would extend up to 25 feet below ground surface. If the Pleistocene Colma Formation is located at depths less than the expected excavation depth below ground surface, following Caltrans guidelines, a Paleontology Mitigation Plan (PMP) would be prepared.

By avoiding ground disturbing activities in the vicinity of the AWSS, adhering to the minimization measures (i.e., following ESA Action Plan, ESA monitoring, ESA training for the contractors), and implementing a PMP if necessary, there would be no impacts to cultural resources in the vicinity of the project.

Hazards and Hazardous Materials

A hazardous waste Initial Site Assessment (ISA) was conducted by AECOM for the project.[11] The purpose of the ISA was to assess and identify the potential for the presence of hazardous materials/wastes or contamination at the

[9] Caltrans/AECOM, 2018, *Draft Historic Property Survey Report for the I-280 Southbound Ocean Avenue Off-Ramp Realignment Project At Balboa Park,* March.
[10] AECOM, 2017, *I-280 Southbound Ocean Avenue Off-Ramp Realignment Project at Balboa Park Paleontological Identification Report/Paleontological Evaluation Report*, July 11.
[11] AECOM, 2016, *I-280 Southbound Ocean Avenue Off-Ramp Realignment Project At Balboa Park Initial Site Assessment*,

project site as well as any responsible or potentially responsible parties associated with identified contamination. The ISA determined that the following conditions may affect the project area and would requiring further evaluation:

- The City College Landfill (considered a controlled recognized environmental condition [CREC]) is located to the adjacent west of the project site.[12]
- Exposed shallow soils in the proposed project area adjacent to the existing freeway off-ramp and in the median area between the freeway off-ramp, I-280, and Ocean Avenue could be contaminated with ADL.
- Wooden roadside sign poles observed in the project area may have been treated with chemical preservatives to prevent rotting and insect infestation.
- There is the potential to encounter bedrock during construction that may contain naturally-occurring asbestos.
- Lead-based pigments associated with traffic striping paints and thermoplastic striping material may be present in the project area.
- It is likely that herbicides are or have been used for control of foliage adjacent to the existing off-ramp.
- Lead chromate pigment may have been used in traffic control striping colored safety yellow in the project area.
- Roadway construction or demolition that generates grindings of asphaltic-concrete (AC) or Portland cement concrete (PCC) may have a relatively high pH and may also contain concentrations petroleum hydrocarbons and/or metals that can affect stormwater runoff and contaminate surface water bodies.
- Materials falling under the Universal Waste Rule (UWR) requirements may be present in the project area, including, but not limited to: hi-intensity vapor lights and associated ballasts.

Once the areas of excavation and soil disturbance are known, a Preliminary Site Investigation (PSI) will be performed to evaluate hazardous materials concerns related to soil, groundwater, and construction materials in the proposed project area, as identified in this ISA. A workplan for the PSI should be submitted to the SFDPH who is the local regulatory oversight agency for review and approval. The PSI will have to satisfy the requirements of the SFDPH Article 22A (also known as the Maher Ordinance). Additional investigation may be required to fully evaluate potential hazardous materials issues if concerns are identified during the PSI. The results of the environmental investigation(s) will be provided to construction contractors, so the findings can be incorporated into their Health and Safety and Hazard Communication Programs. Implementation of the PSI and compliance with all recommendations included in the PSI would minimize exposure of workers and the general public to hazardous material of concern and no impacts would result.

Hydrology/Water Quality

A technical memorandum was prepared for the project to document the existing floodplains and drainage systems within the project area and evaluate potential impacts from the project to the floodplain and drainage systems.[13]

December 30.

[12] A CREC is defined as: A recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority (for example, 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 (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls).

The memorandum determined that the project was outside the 100-year floodplain and therefore the 100-year flood will not interrupt traffic and there will be no fill inside the floodplain as a result of the Project. The memorandum also determined that there are no floodplains within the project limits, and therefore, no impacts to natural and beneficial floodplain values would result.

There would be minor floodplain impacts associated with the project. The project would add approximately 21,500 square feet of impervious area and replace approximately 14,000 square feet of impervious surface, but would not significantly increase flows or affect floodplain areas. Therefore, floodplain avoidance, minimization, or mitigation measures are not required for the project.

A Caltrans Stormwater Data Report was also prepared for the project.[14] According to the report, the existing drainage system within the Project limits is composed of storm drains along the I-280 off-ramp and Ocean Avenue, as well as roadside asphalt concrete gutters. The project is exempt from implementing stormwater treatment measures due to water flowing into the combined sewer system.

The project is historically in the South Bay Hydrologic Unit and the San Mateo Bayside Hydrologic Sub-area. The project is located within the Islais Creek watershed. Streams historically flowed east and discharged into the Islais Creek channel. Streams in the watershed have been superseded by the sewer systems managed by the San Francisco Public Utilities Commission (SFPUC).

There are no streams within the project limits. Stormwater drainage systems now reroute runoff into the combined sewer system. Runoff would be treated at the SFPUC's Southeast Treatment Plant approximately four miles from the project site, and then discharged into the Islais Creek channel and eventually the San Francisco Bay. The SFPUC is currently upgrading the Southeast Treatment Plant to improve its operation and treatment processes.

A Storm Water Pollution Prevention Plan (SWPPP) would be required from the Contractor and approved by the Caltrans Resident Engineer prior to the start of construction. The SWPPP includes all monitoring and sampling procedures and instructions, location map, forms, and checklist as required by the CGP (Order No. 2009-009-DWQ, as amended by 2010-0014-DWQ and 2012-0006-DWQ). It would identify BMPs to reduce water quality impacts during construction. The SWPPP would emphasize: 1) standard temporary erosion control measures to reduce sedimentation and turbidity of surface runoff form disturbed areas, 2) personnel training, 3) scheduling and implementation of BMPs, 4) identification of BMPs for nonstormwater discharge such as fuel spills, and 5) mitigation and monitoring throughout the construction period. Because the project would disturb more than one acre of soil, the project is subject to the Construction General Permit (CGP), and a risk assessment is also required. Compliance with these measures and all applicable regulations and best management practices would minimize potential impacts to stormwater.

Land Use

The project would not alter existing land uses at the site. The project would not physically divide an established community. Additionally, since the proposed off-ramp is located on the same site as the existing off-ramp, the project would be compatible with the existing land use plan. The project would not generate an increase in traffic congestion; the purpose of this project is to improve safety in the area by installing a traffic signal and eliminating a free right turn at the southbound 1-280 off-ramp and Ocean Avenue intersection. As such, the project would not have an impact on existing land use plans, nor would it divide existing communities.

[13] WRECO, 2017. *Interstate 280 Southbound Ocean Avenue Off-Ramp Realignment Project at Balboa Park, Hydrology and Hydraulic Memorandum*, June 23.
[14] WRECO, 2017. *Long Form – Stormwater Data Report*, October.

Noise

The closest noise sensitive land uses are the City College of San Francisco (directly west of the project area) and Balboa Park (directly east of the project area). Existing ambient noise levels in the project area are relatively high due to the proximity of the I-280 freeway.

The operation of heavy equipment during the construction phase of the project may result in temporary increases in noise levels. However, this increase would be minimal and short term, lasting only for the duration of the construction phase. Construction activities would comply with all City and Caltrans regulations adopted to minimize construction-related noise impacts.

Once constructed, the project would not result in an increase in the capacity of the existing off-ramp or add any new through-traffic lanes in the project area. In addition, the project would not result in a substantial horizontal change in the location of noise-generating vehicles relative to existing sensitive receptors. Therefore, there would not be a substantial operational change in traffic-generated noise in the project area and no impact would result.

Recreation

The project would not impact public recreation facilities. Balboa Park, part of the San Francisco Recreation and Parks system, is located across I-280 from the project site. The project would not impact this park, as it is not located in the immediate vicinity of the project. Furthermore, the west side of the Balboa Park that is adjacent to the freeway has many large trees that act as a buffer to shield views of I-280 from recreationists.

As mentioned above in the Purpose and Need section of this document, the project would improve safety compared to existing conditions at the project site. There are multiple pedestrian and cyclist destinations within the Balboa Park neighborhood, such as CCSF, Lick Wilmerding High School, Balboa Park, and Balboa Park BART and Muni stations. Currently pedestrians cross the southbound I-280 off-ramp at an uncontrolled crosswalk where vehicles exit the freeway at high speeds. Additionally, Ocean Avenue is the primary east-west bicycle route in the area, the current free-right turn from the southbound I-280 off-ramp is dangerous for westbound cyclists attempting to stay in the rightmost lane and merge with vehicles exiting the freeway at high speeds. Implementation of the project would not result in impacts to recreational resources in the project area.

Safety and Emergency Services

Over the 12 month construction period, emergency personnel traveling from I-280 southbound into the Balboa Park neighborhood through the project area may experience minor delays in response times. To ensure traffic operations are not significantly impacted during construction, the construction activities would be phased to preserve existing lane capacity and movements. The proposed ramp realignment would be constructed in four unique stages. Construction Stage 2b and Stage 4a would require nighttime closure of the existing off-ramp for up to five nights each. Advanced notification would be posted and temporary detours at the Geneva off-ramp and/or Monterey off-ramp would be utilized. A construction traffic management plan would be adopted for the project and would outline these detours. Emergency personnel would be informed of the detours in advance of the closures.

Once construction is complete, the realignment and widening of the existing southbound I-280 off-ramp at Ocean Avenue would not alter emergency response times in the area. During operation, it is anticipated that the improvements would maintain the current capacity of the southbound I-280 off-ramp. There would not be a need for additional emergency personnel as a result of the project. Although there may be temporary impacts to emergency service response time during construction, these impacts would be restored to standard levels once

construction is complete. Therefore, the project would not have a long-term impact on safety and emergency services.

Traffic and Transportation

A Future Traffic Operational Analysis Report was prepared for the project to analyze the proposed I-280 southbound Ocean Avenue off-ramp realignment and evaluate intersections and queue lengths under a no action alternative as compared to the project.[15] The report also calculated whether the project would impact the existing levels of service (LOS) within the project vicinity.

Based on the traffic analysis, the following conclusions were made for the project:

- All study intersections would operate at acceptable levels of service with implementation of the project.
- The proposed off-ramp realignment, including additional storage capacity and signalization, would reduce existing queues at the off-ramp.
- Pedestrian and bicycle safety and operations would be improved in the project vicinity.
- Congestion would be reduced by controlling movements at the intersection and providing additional storage capacity on the off-ramp.

Therefore, the project would not result in impacts to existing traffic and transportation operations.

[15] AECOM 2017, *I-280 Southbound Ocean Avenue Off-Ramp Realignment Project at Balboa Park Traffic Operational Analysis Report*, July 10.

ATTACHMENT K
Initial Site Assessment

F I N A L

I-280 SOUTHBOUND OCEAN AVENUE OFF-RAMP REALIGNMENT PROJECT AT BALBOA PARK

INITIAL SITE ASSESSMENT

Prepared for:

San Francisco County Transportation Authority (SFCTA)
Caltrans District 4, Oakland

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1.0 INTRODUCTION AND PROJECT DESCRIPTION

This report presents the results of the Initial Site Assessment (ISA) conducted by AECOM for the Interstate 280 (I-280) Southbound Ocean Avenue Off-Ramp Realignment Project at Balboa Park in the City and County of San Francisco, California (Site). The project would include the widening and realignment of the existing I-280 off-ramp at Ocean Avenue.

1.1 Purpose of the Initial Site Assessment

AECOM performed this ISA in support of the preliminary engineering and environmental review for the proposed project. The purpose of the ISA is to assess and identify the potential for the presence of hazardous materials/wastes or contamination at the Site as well as any responsible or potentially responsible parties associated with identified contamination. This information is used to evaluate alternatives, make decisions about project design, cost, scope and schedule.

In accordance with the Caltrans Environmental Handbook, Chapter 10 (Caltrans, 2012), potential sources of contamination at the Site were identified as Recognized Environmental Conditions ("RECs") in accordance with the American Society of Testing and Materials ("ASTM") Method E1527-05 (now ASTM E1527-13), Standard Practice for Environmental Site Assessments: Phase I Environmental Assessment Process. The ASTM Standard E1527-13 defines RECs as:

> The presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to any release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. Conditions determined to be *de minimis* are not recognized environmental conditions.

The publication of ASTM Standard E 1527-13 also includes the evaluation of environmental conditions as a controlled REC (CREC), a historical REC (HREC), or as a *de minimis* condition.

A CREC is defined as:

> A recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority (for example, 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 (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls). Conditions determined to be *de minimis* are not CRECs.

4.0 ENVIRONMENTAL DATA REVIEW

4.1 Regulatory Database Search Report

AECOM contracted with Environmental Data Resources, Inc. (EDR) to conduct a preliminary search of federal, state, tribal, and local regulatory agency records pertaining to past and present hazardous materials use, storage, generation, disposal, and releases at the Site and on properties near the Site. EDR generated their database summary report on August 30, 2016. The information from this search is compiled in the EDR Radius Map™ Report with GeoCheck® (EDR report). The EDR report was generated using search distances that were equal to or greater than the minimum search distances presented in ASTM E1527-13 ranging up to 1 mile from the Site.

It should be noted that this information is reported as AECOM received it from EDR, which in turn reports information as it is provided in various government databases. It is not possible for either AECOM or EDR to verify the accuracy or completeness of information contained in these databases. However, the use of and reliance on this information is a generally accepted practice in the conduct of environmental due diligence.

4.1.1 Search Results

The EDR report identified no cases on the Site property, and 67 cases within a one mile search radius from the Site. Locations of the properties are shown on the map included in the EDR report (***Appendix A***). It should be noted that many properties may be occupied by multiple facilities or have changes in ownership or listing name for the same property. In addition, some properties are listed in multiple databases.

Table 4-1 includes a summary of the federal, state and proprietary databases searched by EDR within the indicated survey distances and the results of the search:

Table 4-1
Summary of Federal and State Regulatory Agency Records Review

Federal or State List	Does Site Appear on List?	Surrounding Area Search Radius *	Number of Sites Within Search Radius
STANDARD ENVIRONMENTAL RECORD SOURCES			
Federal NPL site list	No	1.0 mile	0
Federal Proposed NPL list	No	1.0 mile	0
Federal NPL Liens list	No	Property	0
Federal Delisted NPL site list	No	1.0 mile	0
FEDERAL FACILITY list	No	1.0 mile	0
SEMS	No	0.5 mile	0
SEMS-ARCHIVE	No	0.5 mile	0
Federal RCRA CORRACTS facilities list	No	1.0 mile	0

An HREC is defined as:

> A past release of any hazardous substances or petroleum products that has occurred in connection with the property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the property to any required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls).

A *de minimis* condition is defined as:

> A condition that generally does not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be *de minimis* are not RECs or CRECs.

Based on the research and field observations, the ISA includes a recommendation regarding whether or not a PSI should be performed and makes specific investigation recommendations.

1.2 Project Summary

San Francisco County Transportation Authority (SFCTA) in cooperation with the California Department of Transportation (Caltrans) proposes to modify the existing southbound I-280 off-ramp to Ocean Avenue and Geneva Avenue, shown in the Site Vicinity Map (***Figure 1***). The current configuration of the southbound I-280 off-ramp is a single lane free right turn onto Ocean Avenue and a continuation of the ramp to Geneva Avenue.

1.3 Project Description

The realignment and widening of the existing southbound I-280 off-ramp at Ocean Avenue to two lanes would require the construction of a retaining wall approximately 750 feet long with a maximum height of 20 feet. All project components would be constructed within existing State right-of-way. A temporary construction easement of approximately 20 feet by 100 feet may be required along the existing ramp, to the west. No structures would be impacted by the easement.

1.3.1 Project Alternatives

Two alternatives are under consideration for modifications to the Ocean Avenue off-ramp; a No Build Alternative and a Build Alternative. These two alternatives are described below:

No Build – Alternative 1
The No Build Alternative proposes no modifications to the existing I-280 ramp configuration other than routine maintenance and rehabilitation and the currently planned and programmed projects within the area.

Build - Alternative 2
The Build Alternative includes modifications to the existing southbound I-280 off-ramp at Ocean Avenue. The Build Alternative includes the following components:

- Elimination of the existing free right turn lane for vehicles exiting the southbound I-280 off-ramp just prior to the Ocean Avenue/Howth Street intersection.
- Realignment and widening of the existing Ocean Avenue off-ramp to a two-lane T-intersection at Ocean Avenue; and
- Installation of a traffic signal at the realigned southbound I-280 off-ramp/Ocean Avenue intersection to provide controlled crossing for pedestrians and bicyclists.

1.3.2 Project Construction

The realignment and widening of the existing southbound I-280 off-ramp at Ocean Avenue to two lanes would require the construction of a retaining wall approximately 750 feet long with a maximum height of 20 feet. Based on Caltrans 2015 Standard Plan Type 1 retaining wall, the proposed wall footing would require excavation to a depth of 25 feet at the maximum height of the wall.

2.0 SCOPE AND METHODOLOGY

2.1 Scope of Services

An ISA is intended to screen for potential sources of hazardous materials within the limits of a proposed project. The result of an ISA screening is a determination of whether there is a potential that hazardous materials problems requiring further evaluation affect the project area. This ISA was accomplished by, and limited to, a reconnaissance of the project area and review of the documentation described in Section 3 for information about past and current land uses that might involve the manufacture, generation, use, storage, and/or disposal of hazardous substances in the project area and study area.

2.2 Methodology

The ISA included the following steps:

- AECOM contracted with Environmental Data Resources, Inc. (EDR) to conduct a regulatory database search of known potential hazardous materials sites, including underground storage tanks (USTs); landfills; hazardous waste generation, treatment, storage, and disposal facilities; and subsurface contamination within an area extending up to 1 mile from the proposed project area. A copy of this report is included on as ***Appendix A***.
- AECOM staff visited the project area on November 4, 2016, to perform a site reconnaissance. A summary of this reconnaissance is included in Section 5 and a photographic log is included as ***Appendix C***.
- AECOM reviewed available historical aerial photographs covering the project area and adjacent areas provided by EDR as well as those available on Google Earth. A summary of the findings are included in Section 4.3.
- AECOM reviewed available historical topographic maps covering the project area and adjacent areas provided by EDR. The findings are summarized in Section 4.3.
- For select properties within or near the proposed right-of-way that showed potential for environmental impacts to soil and/or groundwater of the project area, AECOM staff reviewed applicable available files from the Envirostor and Geotracker web-based databases maintained by the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) and San Francisco Bay Regional Water Quality Control Board (RWQCB), respectively.

3.0 STUDY AREA DESCRIPTION AND PHYSICAL SETTING

3.1 Topography

The Site is located on the western side of a small valley that is approximately one mile wide in the vicinity of the Site at an approximate elevation of 225 feet above mean sea level (msl).

3.2 Geology

3.2.1 Regional Geology

San Francisco is located on the northern tip of the San Francisco Peninsula, within the Coast Ranges geomorphic province. The Coast Ranges is a northwest-trending series of mountain ranges and valleys. The San Francisco peninsula lies within a down-dropped structural block bounded by the East Bay Hills and the Santa Cruz Mountains. Other major structural elements of the San Francisco Bay region include the San Andreas Fault, located approximately 4.1 miles to the southwest of the site, and the Hayward fault, which is approximately 25 miles to the northeast of the site. The general geologic setting of the city is characterized by relatively rugged bedrock hills bounded by broad valleys and underlain by unconsolidated deposits. The bedrock consists of consolidated rocks of the Franciscan Complex and the Great Valley Sequence of late Jurassic and Cretaceous age. The Franciscan Complex generally consists of graywacke (sandstone), shale, chert, greenstone, and melange; in certain places, serpentine, an asbestos-containing rock-type, is found within the shale matrix. The Great Valley Sequence generally consists of sandstone and shale. Bedrock outcrops in hilly areas account for approximately 24 percent of the land surface in San Francisco. Pleistocene and Holocene age sediments lie on the eroded Franciscan Complex bedrock surfaces and consist of the Pleistocene age Colma Formation and the Holocene age Dune Sands. Descriptions of the major units are presented below.

FRANCISCAN COMPLEX - The rocks of the Franciscan Complex, underlying much of coastal northern California, formed in this subduction zone. In the Bay area, rocks of the Franciscan Complex form the basement for the Coast Ranges east of the San Andreas Fault. The Franciscan primarily consists of graywacke sandstone and argillite, but also contains lessor amounts of greenstone (altered submarine basalt), radiolarian ribbon chert, limestone, serpentinite (altered mantle material), and a variety of high-grade metamorphic rocks such as blueschist (high-pressure formation), amphibolite, and eclogite (high-temperature formation). These rocks are typically highly fractured and disrupted and may be mixed together on a local scale to create what is called a mélange (a "mixture" or "blend"). Franciscan Complex rocks represent an accretionary wedge, a complex body of rock that accumulates in a subduction zone (Elder, 2001).

COLMA FORMATION – The Colma Formation overlies rocks of the Franciscan Complex on the San Francisco Peninsula (Schlocker, 1974). The Colma Formation is mostly comprised of sandy deposits laid down during an interglacial period when sea level was slightly higher than today. The predominately poorly consolidated sands of the Colma likely originated in a variety of environments ranging from shallow bay to dune and valley slopes. It apparently represents shallow bay deposits below about 200 feet in elevation and valley-slope debris above. The

permeable sands of the Colma Formation form a good aquifer, and springs are common at the interface between the Colma Formation and the underlying Franciscan Complex.

DUNE SANDS – The Holocene dune sands mantle the Colma Formation and the Franciscan Complex over large areas of San Francisco. These dunes are composed of sand that has blown up and over the hills from Ocean Beach and Baker Beach. The sand likely originated on the broad coastal plain of the Sacramento/San Joaquin River system, which extended from the Golden Gate to the Farallon Islands (Atwater, 1977; Sloan, 1989). Sand from this plain was transported onto the beaches and blown over the coastal hills during the rapid sea level rise that occurred between about 18,000 and 5,000 years ago. The Holocene sand dunes of this area formed one of the most extensive coastal dune systems on the West Coast, underlying about one-third of San Francisco.

3.2.2 Site Geology

The site is located in hilly terrain in a zone where Colma Formation AND Dune Sand overlies Franciscan Complex deposits consisting of pervasively sheared sandstone, shale and serpentinite, and northeast-dipping greywacke sandstone with minor shale. A relatively small (approximately 5 acre) Pleistocene-age slope debris and ravine fill deposit consisting of silty or clayey sand or gravel overlies the Colma Formation directly west of the project location on the City College of San Francisco campus. Artificial fill deposits ranging from various combinations of gravel, sand silt, clay, rock fragments, organic matter, and man-made debris is mapped approximately 1 mile west of the project site (Bonilla 1998).

3.3 Surface Water

There are no surface water features located at the Site. The closest significant surface water body is Lake Merced located approximately 2.1 miles to the southwest of the Site.

3.4 Hydrogeology

The Site is located within the Islais Valley Groundwater Basin, which is located in the San Francisco Bay Hydrologic Region. The San Bruno Mountains bound the basin on the west. It is separated from the Downtown San Francisco Groundwater Basin to the north and the Visitacion Valley and South San Francisco Groundwater Basins to the south by bedrock topographic highs. The San Francisco bay forms the basin boundary along its entire eastern extent. Annual precipitation within the basin is in the r*a*nge of 20 inches to 24 inches (DWR, 2003).

Geologically the basin can be broadly classified as bedrock and unconsolidated sediment. Impermeable bedrock of the Franciscan Complex forms the base of the water bearing formations. Unconsolidated material overlying the bedrock comprise the water bearing strata and consists of dune sand, the Colma Formation, bay mud and clay, and artificial fill. The Colma Formation consists of fine-grained sand, silty sand and discontinuous beds of clay to five feet thick. The artificial fill is largely composed of dune sand with lesser amounts of silt and clay, and some manmade debris. It reaches a maximum total thickness of approximately 60 feet. The unconsolidated material in aggregate has a maximum thickness of 200 feet

indicating a relatively low storage capacity for groundwater and minimal protection from potential surface contamination (DWR, 2003).

Historical site characteristic information obtained from the EDR Historical Topographic Map Report was used to establish the most likely groundwater flow direction in the project area. The Site is located topographically within a valley, with higher elevations to the north and south. While regional groundwater flow is typically either south to southeast or north to northeast, local groundwater flow may be subject to local variations and subject to local and seasonal changes. Average groundwater depth near the Site ranges from approximately 15-30 feet below ground surface (bgs).

Table 4-1
Summary of Federal and State Regulatory Agency Records Review

Federal or State List	Does Site Appear on List?	Surrounding Area Search Radius *	Number of Sites Within Search Radius
Federal RCRA non-CORRACTS TSD facilities list (RCRA TSDF)	No	0.5 mile	0
Federal RCRA generators list	No		
RCRA-LQG		0.25 mile	2
RCRA-SQG		0.25 mile	3
RCRA-CESQG		0.25 mile	0
Federal institutional control/engineering control registries	No		
USENG CONTROLS		0.5 mile	0
US INST CONTROLS		0.5 mile	0
LUCIS		0.5 mile	0
Federal ERNS list (ERNS)	No	Property	0
State and tribal equivalent NPL list (RESPONSE)	No	1.0 mile	0
State and tribal equivalent CERCLIS (ENVIROSTOR)	No	1.0 mile	0
State and tribal landfill and/or solid waste disposal sites lists (SWF/LF)	No	0.5 mile	1
State and tribal leaking storage tank lists	No		
CA LUST		0.5 mile	24
INDIAN LUST		0.5 mile	0
CA SLIC		0.5 mile	0
State and tribal registered storage tank lists	No		
FEMA UST		0.25 mile	0
CA UST		0.25 mile	8
CA AST		0.25 mile	0
INDIAN UST		0.25 mile	0
State and tribal voluntary cleanup sites	No		
CA VCP		0.5 mile	0
INDIAN VCP		0.5 mile	0
ADDITIONAL ENVIRONMENTAL RECORDS SOURCES			
Local Brownfield lists (US BROWNFIELDS)	No	0.5 mile	1
Local lists of landfill/solid waste disposal sites	No		
ODI		0.5 mile	0
DEBRIS REGION 9		0.5 mile	0
CA WMDUS/SWAT		0.5 mile	0
CA SWRCY		Property	0
CA HAULERS		Property	0
INDIAN ODI		0.5 mile	0

Table 4-1
Summary of Federal and State Regulatory Agency Records Review

Federal or State List	Does Site Appear on List?	Surrounding Area Search Radius *	Number of Sites Within Search Radius
Local lists of hazardous waste/contaminated sites	No		
US CDL		Property	0
CA HIST Cal-Sites		1.0 mile	0
CA SCH		0.25 mile	0
CA Toxic Pits		1.0 mile	0
CA CDL		Property	0
US HIST CDL		Property	0
Local lists of registered storage tanks	No		
CA FID UST		0.25 mile	3
CA HIST UST		0.25 mile	5
CA SWEEPS UST		0.25 mile	3
Local land records	No		
LIENS 2		Property	0
CA LIENS		Property	0
CA DEED		0.5 mile	0
Records of emergency release reports	No		
HMIRS		Property	0
CA CHMIRS		Property	0
CA LDS		Property	0
CA MCS		Property	0
CA SPILLS 90		Property	0
Other Ascertainable Records Including But Not Limited To			
Historical CORTESE	No	0.5 mile	15
Notify 65	No	1.0 mile	1
EDR PROPRIETARY RECORDS			
Manufactured Gas Plants	No	1.0 mile	0
EDR Historical Auto Stations	No	0.25 mile	1
EDR Historical Cleaners	No	0.25 mile	0

* Indicates the distance measured from the Site that was included in the database record search

The listings and locations of the sites in the above referenced table are shown on the radius maps accompanying the EDR Report (***Appendix A***).

4.1.2 Screening Criteria

The following screening criteria were used to identify which of the cases listed in the EDR report should be further evaluated based on their potential to have impacted the subsurface below the project area:

- The facility is either:
  - within the project area; or
  - upgradient of, and within a distance of 1/8 of a mile from, the project area; and
- The facility is listed on one of the databases of reported hazardous materials releases (Federal NPL, Federal CORRACTS, Federal CERCLIS, State CORTESE, State LUST, State SLIC, RESPONSE, Envirostor, etc.); or
- The facility is listed as an RCRA large-quantity hazardous waste generator (LQG), a CERCLIS NFRAP site, a UST operator, an AST operator, a SWEEPS site, a dry cleaner facility or a San Francisco County database site with an underground tank storing a significant volume of hazardous materials; or
- The facility is listed as a solid waste landfill (not including transfer stations).

AECOM reviewed Geotracker case files for groundwater investigations in the vicinity of the site to assess groundwater flow direction. Based on information from three sites (999, 1490, and 1799 Ocean Avenue) there is a groundwater divide between Harold Avenue and Miramar Avenue. On the west side of the divide groundwater flows to the west and on the east side it flows to the southeast. For purposes of this assessment the groundwater flow direction (southeast) from the 999 Ocean Avenue property was used as this is the property closest to the Site.

4.1.3 Screening Results

Two listings in the study area met the above screening criteria. These listings can be found in the EDR report (***Appendix A***). The following provides details for the two listings:

- **Commercial/Residential property located at 324 Havelock Street, San Francisco** (0.102 miles north from the Site – EDR Map ID B3, B4 and B5). The facility is listed on the LUST database (Map ID B3 & B5) and the UST database (Map ID B4) in the EDR report and on the RWQCB's GeoTracker site.

- **City College of San Francisco located at 50 Phelan Avenue, San Francisco** (0.249 miles northwest from the Site – EDR Map ID G23). The facility is listed on the Solid Waste Facilities/Landfill Sites (SWF/LF) database in the EDR report. Information contained in the EDR Report indicates there was a solid waste disposal site located at the City College of San Francisco. The operational status is listed as "Closed", ceasing operations in 1970. The closure type is listed as unknown and the inspection frequency is listed as quarterly.

The facility is listed as "Pre Regulation" and assigned Solid Waste Information System (SWIS) number 38-CR-0020.

4.2 Records Review

4.2.1 Geotracker/Envirostor/Solid Waste Information System Website Database Searches

AECOM reviewed the publicly available GeoTracker and EnviroStor web-based databases maintained by the RWQCB and the DTSC, respectively, for listed facilities located within a distance of 1/8 mile from the Site boundary and upgradient of the Site. One facility, 324 Havelock Street, San Francisco described above, was listed in the GeoTracker database within a distance of 1/8 mile from the Site. No facilities were listed on DTSC's EnviroStor database. Additionally, due to the identification of a solid waste landfill site on the adjacent City College property, AECOM searched the information on the CalRecycle SWIS web page to obtain information regarding the City College Landfill (SWIS No. 38-CR-0020).

Commercial/Residential property located at 324 Havelock Street, San Francisco AECOM reviewed the case closure summary prepared by the City and County of San Francisco Department of Public Health (SFDPH) for details regarding the closure available on the RWQCB Geotracker website. Based on information contained in the Closure Summary, during removal of a 1,500 gallon UST containing gasoline from beneath the sidewalk on March 9, 2004, two soil samples were collected from beneath the UST and analyzed. The results of the analyses indicated there had been a release from the UST. Over excavation of soil beneath the UST was conducted and 6.6 tons of soil were removed. Subsequent to removal of the soil, additional soil samples were collected and analyzed. An Unauthorized Release Report Form was filed on March 11, 2004 and a LUST case was opened. Groundwater was not encountered during removal of the USTs and the excavation was backfilled with clean imported fill material. The SFDPH reviewed the case and issued a Remedial Action Completion Certification for the open LUST case on February 3, 2005. The facility is listed on the LUST and UST databases as "completed – case closed as of 2/3/2005". A copy of the SFDPH Remedial Action Completion Certification and Case Summary are presented in ***Appendix B***.

City College of San Francisco located at 50 Phelan Avenue, San Francisco
Based on the information presented in the EDR report, AECOM searched both the RWQCB Geotracker and DTSC Envirostor website and the SWIS database on the CalRecycle website. There was no information pertaining to the City College landfill on the Geotracker or Envirostor website. The SWIS website contained information including some early soil and groundwater characterization reports, conceptual design plans for a landfill gas mitigation system for proposed buildings in the landfill area, and site inspection reports from the local enforcement agency (LEA).

The LEA listed for the facility is the SFDPH. To date a total of three inspections have been conducted in 2016. During the February inspection three Areas of Concern were identified. These included Gas Monitoring & Control, Structure Monitoring, and Final Cover. During the June inspection the areas of concern previously identified in February were upgraded to Violation status. During the September inspection the majority of the violations had been abated. Two areas of concern noted were for Gas Monitoring and Control and Final Cover.

Inspection records date back to 2006. Several Violations have been issued over the years for non-compliance. Copies of the 2016 and previous Inspection Reports are presented in ***Appendix B***.

AECOM reviewed the Geo/Resource Consultants, Inc. (GRC) report titled Additional Environmental Investigation: Fill Characterization; Monitoring Well Installation; and First-Quarter Groundwater Monitoring, City College of San Francisco, San Francisco, California dated December 1994 (GRC, 1994). AECOM also reviewed the GRC report titled Groundwater Monitoring, City College of San Francisco, Phelan Campus,

Proposed Central Shops Project Site, Second Round Quarterly dated March 9, 1995 (GRC, 1995). A summary of the information contained in these reports is presented below.

ADDITIONAL INVESTIGATION REPORT

Background Information

Based on information presented in the GRC report, the relatively flat ground surface at the location of the Central Shops and associated parking and yard area was reportedly created in the 1950's by cut and fill activities (GRC, 1994). In the process of grading, large cypress trees and other organic debris were reportedly buried within the fill. A building supporting horticulture activities was destroyed by fire in the early 1950's, and debris from that structure was also reportedly incorporated into the fill.

In September 1993, a geotechnical investigation performed by GRC for the proposed new construction of the Central Shops Building identified soil and debris fill beneath the project site. During drilling, organic odors were detected in several borings and in soil samples collected from some of the borings.

A preliminary environmental investigation was performed by GRC in March of 1994. During the March 1994 investigation, isolated trace concentrations of chlorinated pesticides, some low levels of petroleum hydrocarbons, and few, isolated, slightly elevated lead levels were found in soil samples collected from the fill material. Additionally, methane gas exceeding the Lower Explosive Limit (LEL) was measured in several soil borings.

Plans for the proposed new building included, possibly, a 20-foot deep excavation for a basement. Worker exposure and disposal costs associated with excavating potentially contaminated soil was therefore, a concern. GRC provided cost scenarios for various alternatives for mitigating methane, contaminated soil disposal, and construction-integrated options (GRC, September 1994). Recommendations were made by GRC to perform additional investigation to fill data gaps.

Scope of Additional investigation

The scope of work for the additional investigation included advancing twelve soil borings, C-1 to C-12, through the total fill thickness and several feet into underlying natural strata. Soil

borings were located between previous borings from earlier phases of investigation in order to fill in data gaps and to obtain uniform coverage of the fill. Borings were between 12 to 20 feet deep and an average of three soil samples per boring were collected for analytical testing.

Nine of the twelve soil borings were completed as dry wells so that they could be incorporated into a methane collection system at a later date. Dry wells penetrated total fill thickness and were screened from near surface to total depth. Five soil samples per boring were taken from the monitoring wells for analytical testing.

Four groundwater monitoring wells were installed at the site. The wells were 44 to 49 feet deep and completed in the underlying native strata. At the time of the investigation groundwater was encountered at 35 feet below ground surface (bgs).

Investigation Findings

Approximately 53 soil samples and three groundwater samples were tested for chlorinated pesticides, lead, and total petroleum hydrocarbons as gasoline (TPH-G) and benzene, toluene, ethylbenzene, and xylenes (BTEX). Selected soil samples were also tested for soluble fraction chlorinated pesticides using the California Waste Extraction Test (WET) method for comparison with Soluble Threshold Limit Concentration (STLC) criteria, lead STLC, and total recoverable petroleum hydrocarbons (TRPH). Most of the analytical test results were below regulatory levels of concern or non-detect within laboratory reporting limits (GRC, 1994).

Chlorinated Pesticides

Two isolated hits of chlordane were detected in soil at concentrations of 0.1 milligrams per kilogram (mg/Kg) and 3.1 mg/kg and one trace hit at in groundwater at a concentration of 0.8 micrograms per liter (ug/L) These chlordane concentrations detected in soils are relatively low and their isolated occurrence does not suggest a point source (GRC, 1994).

Of the 53 soil samples tested for organochlorine pesticides, 11of the samples were also tested for soluble fraction chlorinated pesticides using the WET method. Soluble fraction tests were performed on those samples that were reported as non-detect for chlorinated pesticides but with higher than normal laboratory detection limits. WET results confirmed that pesticides are not present at or above reporting or detection limits.

Lead

Five soil samples tested at elevated levels (at or greater than ten times the STLC criteria) for lead. These samples were tested for soluble fraction lead using the WET method for comparison to STLC values. The results of the analyses indicated lead exceeded its STLC value of 5 mg/l in two of the samples analyzed at concentrations of 7.5 milligrams per liter (mg/L) and 19 mg/L. The two soil samples that contained lead concentrations above the STLC were relatively low and their isolated occurrence does not suggest a point source. Lead was

not detected above the laboratory reporting limit in any of the groundwater samples analyzed (GRC, 1994).

Total Petroleum Hydrocarbons as Gasoline and BTEX

TPH-G and BTEX were detected in two soil samples collected from the upper half of fill sequence at concentrations of 2.4 mg/Kg and 160 mg/Kg. Total xylenes were detected in one sample at a concentration of 17 ug/Kg. TPH-g was not detected above the laboratory reporting limit in any of the groundwater samples analyzed.

Total Recoverable Petroleum Hydrocarbons

The 11 soil samples analyzed for soluble fraction chlorinated pesticides were also analyzed for total recoverable petroleum hydrocarbons (TRPH). Results of the analyses indicated the presence of petroleum hydrocarbons in the range of motor oil or higher at concentrations of 11 mg/Kg up to 1200 mg/Kg in the upper half section of the fill sequence. TRPH was not detected in the lower section of fill or in the underlying native material (GRC, 1994).

Extent of Fill and Occurrence of Methane Gas

Based on the results of the boring activities at the site, an estimated 60,000 cubic yards of fill material has been delineated in the area investigated.

Methane readings were typically collected every five feet during drilling activities, using an explosivity meter, calibrated to pentane. Methane gas was detected above the Lower Explosive Limit (LEL) in several borings. Generally, methane was measured in most borings, at trace levels to above 100% LEL. After completion of dry wells and monitoring wells, methane readings were taken again. Comparison of the two sets of readings suggests that variable amounts of methane are present in isolated pockets occurring throughout the fill (GRC, 1994).

Recommendations

Based upon on the results of the additional investigation work GRC recommend the following:

- In general, except for methane mitigation, no remedial action is recommended.
- The ongoing quarterly groundwater monitoring program should continue.
- Analysis of groundwater samples should be reduced to chlorinated pesticides only.
- Methane measurements in dry wells should be performed through the rainy season to evaluate methane levels which may vary seasonally.
- A methane collection system and a methane barrier should be designed and installed as part of new building construction.
- Excavated fill soils generated from the proposed basement excavation should be stockpiled and covered by 10-mil polyethylene sheeting. The stockpile should be covered to prevent precipitation runon-runoff. The stockpile should be sampled and tested for appropriate landfill disposal.

SECOND QUARTER GROUNDWATER MONITORING REPORT

The second quarter groundwater sampling was performed on February 7, 1995. Monitoring wells MW-1 through MW were purged and sampled. The groundwater levels in the wells were, on the average, seven feet higher than levels recorded during the first quarterly sampling event. An increase in the groundwater level of over 13 feet was measured in MW-2, the upgradient well.

The calculated hydraulic gradient across the site was 0.15 ft/ft for the second-quarter. The general groundwater flow direction for the second-quarter is south-east, as compared to south/south-east for the first quarter measurements.

The analytical laboratory results for groundwater samples collected from monitoring wells MW-1 through MW-3 and analyzed for chlorinated pesticides were all below the laboratory reporting limit.

During the second-quarter monitoring event chlordane was not detected above the laboratory reporting limit in the samples collected from all three wells.

GRC indicated that they believed that trace chlordane previously detected in MW-3 at 0.80 micrograms per liter (ug/L) during the first quarterly monitoring event may have been due to contamination introduced into the well from drilling operations at the time of well installation (GRC, 1995).

Copies of the text, tables, and figures from the reports reviewed are provided in ***Appendix B***.

Based on a review of the data presented in the EDR report and readily available information presented above, the City College Landfill site is considered a CREC. The closed UST case for 324 Havelock Street is not considered an environmental concern as the case was a soil only case (i.e. impact from release only affected soil and not groundwater) and it is located a fair distance from the proposed project area.

4.3 Historical Site Use Information

4.3.1 Historical Aerial Photographs

AECOM reviewed 16 historical aerial photographs of the Site for evidence of previous activities and development potentially involving hazardous materials. The aerial photographs were provided in the EDR report and were taken in 1938, 1943, 1946, 1956, 1963, 1968, 1974, 1982, 1993, 1998, 2005, 2009, 2010 and 2012. All of the photos are presented at a scale of one inch equals 500 feet. Copies of the aerial photographs are provided in ***Appendix A***. The following observations were made from the aerial photographs.

- 1938 – A portion of the Site is occupied by a building (the Junior Recreation Museum as indicated on the 1950 Sanborn Fire Insurance Map) at the south east corner. Along a small portion of the north east side of the Site and further to the east and north of the Site, there are what appear to be agricultural fields. There are residential developments located to the north of the agricultural land. Ocean Avenue is present in what appears to

be its current alignment. There is no freeway present however the old Southern Pacific Railroad (SPRR), Monterey Line, right-of-way is present in what will be the future Interstate 280 (I-280) location. To the immediate south of the Site, across Ocean Avenue, is the Eaton & Smith Asphalt Mixing Plant as shown on the 1950 Sanborn Fire Insurance Map. To the south of this are residential developments. To the southeast of the Site is the United Railroads Car Shop facility used for the repair of railroad cars as shown on the 1915 Sanborn Fire Insurance Map. This facility is listed as the San Francisco Municipal Railways Car Shops on the 1950 Sanborn Fire Insurance Map. To the west of the Site are the lands of the San Francisco Junior College (known now as the City College of San Francisco). There appears to be some development for the college construction under way along Phelan Avenue.

- 1943 – The 1943 aerial photograph is blurry and detail is hard to distinguish. However, the Site appears to be relatively unchanged. To the west is the main building of what is now San Francisco City College. The remainder of the surrounding area appears unchanged.

- 1946 – There does not appear to be much change in the Site or surrounding property use between the 1943 and 1946 aerial photographs. There are what appear to be military barracks to the west, across Phelan Avenue, and to the adjacent north of the existing San Francisco Junior College building on Phelan Avenue.

- 1956 –The building located in the south east corner of the Site (the Junior Recreation Museum) is no longer present. There are now buildings located in the center and northern portion of the Site. The area to the east of the Site, across the SPRR right-of way, is now Balboa Park and contains sport fields and other structures. There has been continued development of the City College campus and there are new buildings east of the main building on Phelan Avenue and near the intersection of Ocean and Phelan Avenues. There are also several new parking areas located on the campus grounds. The barracks observed in the 1946 aerial photo, west of Phelan Avenue, are no longer present. There are still what appear to be military barracks located to the north of the City College campus. To the east of the barracks Riordin High School is now present and to the south of the Site, across Ocean Avenue, a portion of Lick Wilmerding High School is now present.

- 1963 – The buildings previously observed in the center of the Site are no longer present and there are new structures occupying this area and the area to the north. The narrow SPRR right-of-way corridor has now been significantly widened for the construction of Interstate 280. Ocean Avenue appears to have been repaved and has been diverted to the north of its original alignment for the construction of the elevated portion of Ocean Avenue that will cross over the I-280 right-of-way. There is now a football field and track located to the adjacent northwest of the Site on the City College campus. The military barracks located to the north of the City College campus are no longer present and there is a new multi-story structure present. The area to the west of City College where military barracks were once present is now what appears to be large parking lots for City College. The San Francisco Municipal Railways Car Shops now appears to be a Muni Bus maintenance facility.

- 1968 – I-280 construction in the vicinity of the Site appears to be complete and Ocean Avenue is returned to its original configuration and is now an overcrossing going over I-280. The Ocean Avenue exit is present and the area next to the road appears to be vegetated. Buildings previously present to the north of the football and track field are no longer present.

- 1974 – The Site and surrounding area remain relatively unchanged from the 1968 aerial photo. There are now trees adjacent to the Ocean Avenue exit from I-280 South. There are some new structures located to the north of the football field and track on the City college campus. The Balboa Park BART Station is present adjacent to I-280 to the southeast of the Site.

- 1982 – The Site and surrounding area remain relatively unchanged from the 1974 aerial photo. There is a new multi-story building present to the northwest of the football field and track on the City college campus. The site of the San Francisco Municipal Railways Car Shops has been reconfigured. The old building is no longer present and a new building has been constructed. There are now rail tracks on the west side of the property with Muni rail cars.

- 1993 – The Site and surrounding area remain relatively unchanged from the 1982 aerial photo. There are some new structures located to the north of the football field and track. The Balboa Park Muni Station is now present to the southeast of the Site.

- 1998 – The Site and the surrounding area remain relatively unchanged from the 1993 aerial photo.

- 2005 – There are two new buildings on the City College campus along the western portion of the site. The Site and the remainder of the surrounding area remain relatively unchanged from the 1998 aerial photo.

- 2009 – The Site and the surrounding area remain relatively unchanged from the 2005 aerial photo. Several of the buildings located to the north of the football field and track are no longer present.

- 2010 – The Site and the surrounding area remain relatively unchanged from the 2009 aerial photo.

- 2012 – The Site and the surrounding area remain relatively unchanged from the 2010 aerial photo. The area to the north of the football field and track is now occupied by a soccer field.

Based on a review of historical aerial photographs, a portion of the proposed project area has been used as a freeway off-ramp and other portions are located adjacent to or in close proximity to the I-280 corridor and Ocean Boulevard before the full phase-out of lead in gasoline. Therefore, exposed shallow soils in unpaved areas adjacent to and in close proximity to the freeway could potentially be contaminated with ADL.

4.3.2 Historical Topographic Maps

AECOM reviewed available topographic maps covering the Site from EDR for evidence of previous activities at the Site and in the surrounding area that may suggest the potential presence of hazardous materials. The maps were dated 1896, 1899, 1915, 1939, 1947, 1950, 1956, 1968, 1973, 1980, 1995, 1996, and 2012. The 1947 and later maps are a 1:24,000 scale while the earlier maps (1896, 1899, 1915, 1939) are 1:62,500. The following observations were made of the Subject Property and site vicinity. Copies of the historical topographic maps are provided in ***Appendix A***. Descriptions of each map are presented below.

- 1896 – The Site is located on the western side of a small valley that is approximately one mile wide in the vicinity of the Site at an approximate elevation of 225 feet above mean sea level (msl). A small unnamed creek runs through the center of the valley. The San Miguel Hills are mapped to the north of the Site. The Site is shown to the northeast of the town of Oceanview, on or very close to the alignment of the SPRR Monterey Line. It appears that a portion of Ocean Avenue is present to the east of the railroad alignment. The map shows two structures to the west of the Site in the area of the current City College that are labeled as Industrial School.

- 1899 – The Site and surrounding area remain unchanged from the 1896 map.

- 1915 – The Site remains relatively unchanged from the 1899 map. There has been significant development, mainly what appears to be residential, in the surrounding area to the north, east, and south of the Site

- 1939 – The entire area around the Site has been infilled with surface streets. The area to the west of the Site is now shown as San Francisco Junior College. The buildings that were previously present are no longer there. Mt. Davidson is shown to the northeast of the Site in what was previously listed as the San Miguel Hills. The City of Daly City is shown to the south of the Site. There is a major road (Highway) shown to the east of the Site.

- 1947 – The Site is shown on the map as being part of Balboa Park. There is a building located in the southeastern corner of the Site. There are also other buildings shown in Balboa Park. The major road to the east of the Site is identified as Alemany Boulevard (Highway 101). There are several schools shown in the area including Balboa High School to the southeast.

- 1950 – There is little to no change between the 1947 and 1950 maps.

- 1956 – The building located in the southeastern corner of the Site is no longer present. There is a new structure located near the central portion of the Site and new buildings on the San Francisco Junior College that has been renamed City College of San Francisco. There is an unnamed school now located to the south of the Site across Ocean Avenue. San Jose Avenue to the east has been converted to a 4-lane road that feeds into a 6 lane road to the north which is the southern extent of I-280. The railroad tracks are no longer present north of Balboa Park in preparation of I-280 construction to the south.

- 1968 – The Site is now occupied by the Ocean Avenue exit from I-280. The building previously shown in the center of the Site is no longer present and there is a new building near the northern end of the Site. I-280 is present to the south of the Site. Several new structures are shown on the City College campus. There is a large structure now present to the southeast across i-280 and Ocean Avenue.

- 1973 – There is little to no change at the Site on the 1973 map. There is what appears to be a sports field or track located to the northwest of the Site on the City College campus. There is a "Railroad Station" shown in Balboa Park east of the Site across I-280.

- 1980 – There is little to no change at the Site on the 1980 map. There are a few buildings located on the City College campus. The large structure to the southeast of the Site across I-280 and Ocean Avenue is no longer present and a new structure has been built on the east side of the property.

- 1995 – There does not appear to be any change to the Site on the 1995 map. There is no longer any building detail shown on the topographic map

- 1996 – There is no change to the Site or surrounding area on the 1996 map.

- 2012 – There is no change to the Site or surrounding area on the 2012 map.

4.3.3 Sanborn Fire Insurance Maps

AECOM contracted with EDR to conduct a search of their collection of Sanborn® Fire Insurance Rate Maps for coverage including the Site. Sanborn® Fire Insurance Rate Maps for the years 1915, 1950, 1972, 1975, 1989, 1991, and 1999 were available for the Site. Copies of the historical Sanborn® Fire Insurance Maps are provided in ***Appendix A***.

- 1915 – The Site is shown as Balboa Park on the map. Ocean Avenue is shown to the south of the Site. The City Street Improving Company (listed as asphalt mixer) is shown to the south of the Site across Ocean Avenue. The United Railroads Car Shops (a cable car repair shop) is located to the southeast of the Site across Ocean Avenue.

- 1950 – There are three structures located on the Site. In the southeast corner there is a building consisting of three separate wings that is listed as the Junior Recreation museum. Near the center there are two structures, one listed as the Floriculture Building and the other a greenhouse that is attached to the Floriculture Building. In the northern portion there is a building listed as the Men's Gymnasium constructed in 1940. The SPRR tracks are shown along the eastern side of the Site. The City Street Improving Company shown on the 1915 map is now shown as Eaton & Smith Asphalt Mixing. The old facility appears to be gone and a new facility built in its place. There are residential dwellings shown to the south of the Eaton & Smith Asphalt Mixing site. The United Railroads Car Shops is now shown as the San Francisco Municipal Railways Car Shops.

- 1972 – The only structure left on the Site is the Men's Gymnasium. The Southern Freeway (I-280) is shown going through the Site. There are some other structures (class rooms) and an athletic field and bleachers associated with City College of San Francisco located to the west of the Site. The Eaton & Smith Asphalt Mixing facility is no longer present and a school is now present. The San Francisco Municipal Railways Car Shops is still present to the southeast of the Site across Ocean Avenue.

- 1975 – There is no change to the Site or surrounding area between the 1972 and 1975 maps.

- 1989 – There is no change to the Site or surrounding area between the 1975 and 1989 maps.

- 1991 – There is little to no change to the Site or surrounding area between the 1989 and 1991 maps. There has been a buildings (class rooms) added to the school to the south of the Site across Ocean Avenue.

- 1999 – There is no change to the Site in the 1999 map. The class rooms shown to the west of the Site on the City College campus are no longer present and a large building shown as the Library and Learning Resource Center is now present.

4.3.4 Building Permits

AECOM reviewed the building permit file information provided by EDR. Because there is no proper site address, there is no permit information for the Site.

4.4 Previous Environmental Studies

No previous environmental studies for the Site were made available or provided to AECOM for review. Readily available previous environmental studies for the City College property were reviewed and the results presented in Section 4.2.1 above.

5.0 SITE RECONNAISANCE

Mr. Erik Skov of AECOM in Oakland, CA conducted a reconnaissance of the Site and surrounding area on November 4, 2016. The reconnaissance included both a walking and a drive-by survey of the proposed project area and its surrounding and adjacent properties in the study area that were publically accessible. Photos taken during the site reconnaissance are presented in ***Appendix C***. Access to the Site and portions of the surrounding area, was limited as it is currently an active freeway off-ramp. Additionally, access from the City College side of the Site is limited by the presence of cyclone fencing and a secure fenced in area around the Central Shops Building and associated storage and parking area.

The reconnaissance confirmed information gathered during the review of historical information (mainly aerial photographs) regarding the presence of I-280, the Ocean Avenue off-ramp, Ocean Avenue, City College, Lick Wilmerding High School, Balboa Park, and the San Francisco Municipal Railways Car Shops.

The proposed project area has been developed mainly for transportation related purposes and is partially occupied by portions of the Ocean Avenue exit from I-280 and undeveloped areas west and south of the existing off-ramp (***Figure 2)***. There are no buildings or other structures located at the property.

During the reconnaissance of the proposed project area AECOM noted the following:

- No petroleum products were observed.
- No underground storage tanks or aboveground storage tanks were observed.
- No drums of hazardous or non-hazardous materials were observed.
- No pad mounted or pole mounted liquid transformers were observed at the proposed project area Subject.
- With the exception of power for the observed off-ramp roadway lighting and storm drain intakes, no other utilities such as gas, water or sanitary sewer were observed.
- Solid waste at the proposed project area consisted mainly of trash and refuse likely discarded from automobiles. There are no businesses at the proposed project area that generate hazardous waste.
- AECOM did not observe evidence of sumps, pits, ponds, or lagoons during the site reconnaissance.
- No wells (monitoring or supply) were observed. Additionally, no septic system was observed during the reconnaissance.
- No major surface staining odors, pooled liquids, or stressed vegetation were observed during the site reconnaissance.

The area surrounding the proposed project area consists of a vegetated hillside on the western side leading up to the lower plateau area of the City College of San Francisco campus. The portion of the college property in this area is occupied by a student parking lot and the Central Shops Building and enclosed yard and parking area and the Gardner's Shed. These areas where secured (behind a locked gate) and could not be accessed during the site

reconnaissance. To the south of the proposed project area is Ocean Avenue which is followed by Lick Wilmerding High School. To the east and north is I-280. Balboa Park is located east of the propose project area across I-28.

6.0 INITIAL SITE ASSESSMENT FINDINGS AND CONCLUSIONS

6.1 Common Environmental Concerns and Findings

6.1.1 Potential Hazardous Materials Sites

Based on limited information available on the SWIS website, the City College landfill is located to the adjacent west of the proposed project area (***Figure 2***).

6.1.2 Aerially Deposited Lead

Organolead compounds (mainly tetraethyl and tetramethyl lead) were first added to gasoline in the 1920s as an octane booster to improve engine performance. In 1974 a gradual phase out of the use of organolead compounds in automotive fuels began when the United States Environmental Protection Agency (EPA), under the authority of the Clean Air Act Amendments of 1970, introduced rules requiring the use of unleaded gasoline in new cars equipped with catalytic converters (DTSC, 2016). By 1992 the use of lead as a fuel additive had been banned in California. Prior to the 1970s, the EPA estimated that vehicles emitted approximately 75 percent of the lead consumed in leaded gasoline to the environment in the form of particulate matter in the automobile's exhaust stream (DTSC, 2004). As a result, shallow soils in close proximity to the edge of the pavement in highway corridors and other heavily traveled roads have the potential to be contaminated with aerially deposited lead (ADL) from car emissions prior to the phasing out of lead in gasoline. The highest lead concentrations are typically found within 10 feet of the edge of the pavement and within the top six inches of the soil (DTSC, 2016).

On June 28, 2016 the DTSC and Caltrans entered into an agreement for Soil Management for Aerially Deposited Lead-Contaminated Soil (Agreement), allowing the reuse of some lead-affected soils for construction projects within the State right-of-way as well as outside the State right-of-way provided certain provisions are met and required agreements between the State and property owner are signed (DTSC, 2016). The Agreement allows the reuse of soils containing total lead at concentrations equal to or less than 3,200 milligrams per kilogram (mg/kg) based on a 95 percent upper confidence limit (95% UCL), or soluble lead at concentrations up to 150 milligrams per liter (mg/l), based on a 95% UCL, within the Project construction area and the Caltrans right-of-way, subject to certain restrictions (e.g. minimum cover requirement) and reporting requirements. Soil with concentrations of total lead greater than 3200 mg/kg or 150 mg/l, based on a deionized water Waste Extract Test, cannot be managed under the Agreement and are subject to full regulation as hazardous waste. Additionally, soil with a pH less than or equal to 5 cannot be managed under the Agreement.

Based on a review of historical aerial photographs and topographic maps, portions of the proposed project area have been used as a freeway off-ramp and are located adjacent to the I-280 corridor and Ocean Avenue, both major thoroughfares in the vicinity of the proposed project, that have existed prior to the phase out of leaded gasoline. Therefore, exposed shallow soils in the proposed project area adjacent to the existing freeway off-ramp and in the

median area between the freeway off-ramp, I-280, and Ocean Avenue could be contaminated with ADL. Should soils affected by Project construction contain ADL, implementation of the Caltrans/DTSC 2016 Agreement during construction would allow ADL-contaminated soil to be managed safely without requiring offsite disposal of excavated soils at a hazardous waste landfill, provided concentrations do not exceed the exclusion criteria.

6.1.3 Treated Wood

Timber infrastructure including guardrail supports; telephone, light, and power poles; roadside sign poles; and fencing) may be treated with chemical preservatives to prevent rotting and insect infestation. Chromated copper arsenate (CCA) is a wood preservative consisting of a mixture of chromium, copper, and arsenic that has been used for timber treatment since the 1930s. CCA may potentially leach from wood into surrounding soil. Substitutes for CCA also often contain copper and other chemical compounds. Chlorinated phenols such as pentachlorophenol, tetrachlorophenol, and trichlorophenol are wood preservatives that have similarly been in use since approximately the 1930s, with potentially toxic effects resulting from exposure due to inhalation and skin absorption. Creosote is a wood preservative containing polycyclic aromatic hydrocarbons (PAHs). During the site reconnaissance some wooden roadside sign poles were observed in the off-ramp area. Sampling and analysis of the wood would be required to confirm if it has been treated.

6.1.4 Naturally Occurring Asbestos

As indicated in Section 3.2 above, the bedrock underlying the site has been mapped by the United States Geological Survey (Bonilla, 1998) as rocks of the Franciscan Complex, which can contain serpentinite, a rock type known to have naturally occurring chrysotile (white) asbestos. Although no bedrock outcrops were observed during the site reconnaissance, and Colma Formation sand and Dune Sand are known to overlie the bedrock, excavation for the installation of the retaining wall may extend to depths of up to 25 feet at the maximum height of the wall (20 ft.) based on Caltrans 2015 Standard Plan Type 1 retaining wall. Therefore, there is the potential to encounter bedrock during construction that may contain naturally-occurring asbestos

6.1.5 Lead-Based Paint

Lead-based paint is often present on and in structures built prior to the late 1970s and early 1980s, when the manufacture of lead-based paint was phased out in the United States. Lead is a state recognized carcinogen and reproductive toxin. However, no structures were observed within the off-ramp realignment project area that would require demolition as part of the project scope. Lead-based pigments associated with traffic striping paints and thermoplastic striping material area addressed in section 6.17 below.

6.1.6 Pesticides and Herbicides

Based on the review of historical data for the proposed project area (mainly aerial photographs), there was some agricultural use in the vicinity of the project area in the late

1930s. Additionally, pesticides and herbicides have been used historically near railroad right-of-ways and freeway roadsides for the control of pesticides and weeds. There was no direct evidence of the use of pesticides or herbicides observed during the site reconnaissance. However, it is likely that herbicides are or have been used for control of foliage adjacent to the existing off-ramp. While limited soil excavation is planned, where un-paved areas will experience soil disturbance, investigation of the soil for herbicides is recommended, in conjunction with investigation for aerially deposited lead.

6.1.7 Traffic Striping and Pavement Markers

Lead chromate was the pigment used in traffic control striping colored safety yellow. In 1997 Caltrans discontinued the use of lead chromate in their yellow traffic paint and similarly, in 2004 discontinued its use in thermoplastic striping material opting for a lead and chromium free substitute pigment (Caltrans, 2006). Lead chromate containing striping materials can contain approximately 20,000 parts per million (ppm) of lead and approximately 5,000 ppm of chromium. Unless lead chromate containing material is sufficiently diluted during the process of removal (e.g. during extensive pavement milling), the wastes generated during the removal process of yellow thermoplastic or striping paint may exceed the hazardous waste threshold concentrations contained in the California Code of Regulations or the Resource Conservation and Recovery Act thus, designating the material as a California or Federal Hazardous Waste. If lead and hexavalent chromium concentrations are unknown (i.e., previous residue testing has not been conducted), Caltrans Standard Special Provision 14-001 requires that yellow stripe and pavement markings be managed as an assumed hazardous waste by implementing a lead compliance plan and testing the residues for hazardous-waste classification prior to off-site disposal (Caltrans, 2012b). At the time of the site reconnaissance a small amount of yellow striping along the existing I-280 Ocean Avenue off-ramp was observed.

6.1.8 Asphaltic Concrete and Portland Cement Concrete

Roadway construction or demolition that generates grindings of asphaltic-concrete (AC) or Portland cement concrete (PCC) may have a relatively high pH and may also contain concentrations petroleum hydrocarbons and/or metals that can affect stormwater runoff and contaminate surface water bodies. In accordance with guidance from the RWQCB, Caltrans projects may reuse AC and PCC grindings under three different scenarios as follows: 1) A roadway subbase; 2) As backfill material (e.g., sound wall foundations and shoulder backing); and 3) Compacted surface in a maintenance/work yard. The RWQCB in their guidance indicated that reuse of AC and PCC as road base is acceptable without any testing. However, non-road base reuse scenarios must be reviewed by the RWQCB for approval on a case-by-case basis (RWQCB, 2007). If surplus AC and PCC grindings are not reused they can be transported to an aggregate recycling facility or to an appropriate waste disposal facility. At the time of the site reconnaissance both AC and PCC construction materials were observed on the existing I-280 Ocean Avenue off-ramp.

6.1.9 Non-Point Source Contaminants

Metals from nonpoint runoff sources, such as the large parking lot areas of the City College, vehicle tires, and brake pads, can accumulate along the roadside and in catch basins over time. Sediments in catch basins could contain elevated concentrations of metals and other contaminants such as petroleum hydrocarbons. There were no catch basins observed in the proposed project area during the site reconnaissance.

6.1.10 Polychlorinated Biphenyls (Roadside Transformers)

Roadside pad mounted and pole mounted liquid transformers have the potential to contain or have previously used PCB containing oil. No pad mounted or pole mounted liquid transformers were observed during the site reconnaissance.

6.1.11 Miscellaneous Hazardous Materials (roadside debris, tires, oil, etc.)

Materials falling under the Universal Waste Rule (UWR) requirements may be present in the project area, including, but not limited to: hi-intensity vapor lights and associated ballasts. Additionally, minor amounts of e-waste may also be present in roadside refuse as well as waste tires. At the time of the site reconnaissance what appeared to be some of the high intensity freeway lights were observed along the existing off-ramp alignment.

6.2 Recommendations

6.2.1 Preliminary Site Investigation

Once the areas of excavation and soil disturbance are known, a Preliminary Site Investigation (PSI) should be performed to evaluate hazardous materials concerns related to soil, groundwater, and construction materials in the proposed project area, as identified in this ISA. A workplan for the PSI should be submitted to the SFDPH who is the local regulatory oversight agency for review and approval. The PSI will have to satisfy the requirements of the SFDPH Article 22A (also known as the Maher Ordinance). Additional investigation may be required to fully evaluate potential hazardous materials issues if concerns are identified during the PSI. The results of the environmental investigation(s) should be provided to construction contractors, so the findings can be incorporated into their Health and Safety and Hazard Communication Programs. The general contaminants of concern for investigating soil, groundwater, and construction materials are summarized below.

Soil Investigation

Soil samples should be collected if proposed construction activities will disturb soils in the proposed project area. Soil analytical results should be screened against the RWQCB's (2016) Environmental Screening Levels (ESLs) to evaluate appropriate actions to ensure the protection of construction workers and also be screened against hazardous waste threshold criteria to assess soil management options if materials will be reused onsite or disposed of offsite. The following contaminants of concern should be addressed in the soil investigation.

- **Aerially-Deposited Lead and Herbicides**

  Representative samples of exposed shallow soils should be collected from the proposed project construction area in areas where soil will be excavated or disturbed and analyzed for total lead, soluble lead, and herbicides. Sampling of ADL should be performed in accordance with the requirements of the Caltrans/DTSC 2016 Agreement.

- **Methane Gas Survey**

  A methane gas survey should be conducted in the proposed project area to assess the potential for the presence of methane gas in subsurface soil from the adjacent City College landfill.

- **Naturally Occurring Asbestos**

  The area of excavation for the construction of the retaining wall for the off-ramp should be investigated to depth of construction to assess the potential for the presence of naturally occurring asbestos.

Groundwater investigation

If excavation for construction of the retaining wall is going to require dewatering for construction, representative samples of groundwater should be collected in the area where groundwater will be encountered or where construction dewatering will take place. The groundwater samples should be analyzed for the required constituents to obtain approval for discharge to the publically owned treatment works. Additionally, results should also be compared to applicable ESLs to address potential construction worker exposure.

Hazardous Materials

Representative samples of yellow traffic striping and pavement markings should be collected and analyzed for lead and chromium prior to construction. Alternatively, traffic striping and pavement markings may be managed as an assumed hazardous waste by implementing a lead compliance plan and testing the residues for hazardous-waste classification prior to off-site disposal in accordance with Caltrans Standard Special Provision 14-001.

6.2.2 Hazardous Materials Management and Disposal

Based on the findings and recommendations of the PSI, the construction contractor(s) may need to implement soil, groundwater, and construction materials management and disposal procedures for hazardous materials, as well as construction worker health and safety measures during construction.

7.0 LIMITATIONS

This report has been prepared for use solely by the SFCTA and Caltrans, District 4, and shall not be relied upon by or transferred to any other party, or used for any other purpose, without the express written authorization of AECOM.

This report and the associated work have been provided in accordance with the principles and practices generally employed by the local environmental consulting profession. This is in lieu of all warranties, expressed or implied.

It should be recognized that this study was not intended to be a definitive investigation of potential contamination in the project area and the recommendations provided are not necessarily inclusive of all the possible conditions. This ISA is not a regulatory compliance audit or an evaluation of the efficiency of the use of any hazardous materials in the project area. Soil and/or groundwater sampling was not undertaken during this investigation. Sampling for asbestos, radon, lead-based paint, and lead in drinking water was also not performed as part of this ISA. Given that the Scope of Services for this investigation was limited, it is possible that currently unrecognized contamination might exist in the project area.

The conclusions presented in this report are professional opinions based solely upon indicated data described in this report, visual observations of the project area and vicinity, and AECOM's interpretation of the available historical information and documents reviewed, as described in this report. Unless AECOM has actual knowledge to the contrary, information obtained from interviews or provided to AECOM by the client has been assumed to be correct and complete. AECOM does not assume any liability for information that has been misrepresented to us by others or for items not visible, accessible or present in the project area during the time of the field reconnaissance. The conclusions are intended exclusively for the purpose outlined herein and the project location and project indicated. The Scope of Services performed in execution of this investigation may not be appropriate to satisfy the needs of other users, and any use or reuse of this document or the findings, conclusions, or recommendations presented herein is at the sole risk of said user.

Opinions and recommendations presented herein apply to the project area conditions existing at the time of our investigation and cannot necessarily apply to project area changes of which AECOM is not aware and has not had the opportunity to evaluate. Changes in the conditions in the project area may occur with time due to natural processes or the works of man in the subject project area or adjacent properties. Changes in applicable standards may also occur as a result of legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated, wholly or in part, by changes beyond our control. Opinions and judgments expressed herein are based on AECOM's understanding and interpretation of current regulatory standards and should not be construed as legal opinions.

Changes may occur after the date of issue of the report. Some examples of project area condition changes that limit the useful life of this type of report are as follows: property usage

changes, change in ownership, the occurrence of additional environmental releases, implementation of regulatory changes, updating of regulatory agency files, and/or development of new investigation or remediation results. These or other potential changes could affect the recommendations in this report.

8.0 SIGNATURE OF THE ENVIRONMENTAL PROFESSIONAL

I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in §312.10 of 40 CFR 312 and I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the Site.

_____

Erik Skov P.G. C.H.G.
Senior Geologist

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FIGURES

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Source: U.S. DEPARTMENT OF THE INTERIOR, U.S. GEOLOGICAL SURVEY, SAN FRANCISCO SOUTH QUADRANGLE, CALIFORNIA, 7.5-MINUTE SERIES, 2015, Google Earth Pro., 2016.

SITE LOCATION MAP

February 2018

I-280 Ocean Avenue
San Francisco, California

AECOM

FIGURE 1

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PROPOSED OFF-RAMP CONSTRUCTION AREA

February 2018

I-280 Ocean Avenue
San Francisco, California

AECOM

FIGURE 2

Appendix B

I-280 Southbound Ocean Avenue Off-Ramp Realignment Project at Balboa Park

Preliminary Geotechnical Report

Prepared for:

San Francisco County Transportation Authority (SFCTA)
Caltrans District 4, Oakland

Prepared by:

AECOM

February 2, 2018

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Appendices

1.0 INTRODUCTION

San Francisco County Transportation Authority (SFCTA), in cooperation with the California Department of Transportation (Caltrans), proposes to modify the existing southbound Interstate 280 (I-280) off-ramp to Ocean Avenue and Geneva Avenue to improve Balboa Park BART Station access and circulation, as shown in the Site Vicinity Map (Figure 1-1). The current configuration of the southbound I-280 off-ramp is a single lane free right turn onto Ocean Avenue and a continuation of the ramp to Geneva Avenue. Two alternatives are under consideration for modifications to the Ocean Avenue off-ramp: a No Build Alternative and a Build Alternative. These two alternatives are described below:

- **No Build – Alternative 1**
  The No Build Alternative proposes no modifications to the existing I-280 ramp configuration other than routine maintenance and rehabilitation and the currently planned and programmed projects within the area.
- **Build - Alternative 2**
  The Build Alternative includes modifications to the existing southbound I-280 off-ramp at Ocean Avenue. The Build Alternative includes the following components:
  - Elimination of the existing free right turn lane for vehicles exiting the southbound I-280 off-ramp just prior to the Ocean Avenue/Howth Street intersection:
  - Realignment and widening of the existing Ocean Avenue off-ramp to a two-lane T-intersection at Ocean Avenue; and
  - Installation of a traffic signal at the realigned southbound I-280 off-ramp/Ocean Avenue intersection to provide controlled crossing for pedestrians and bicyclists.

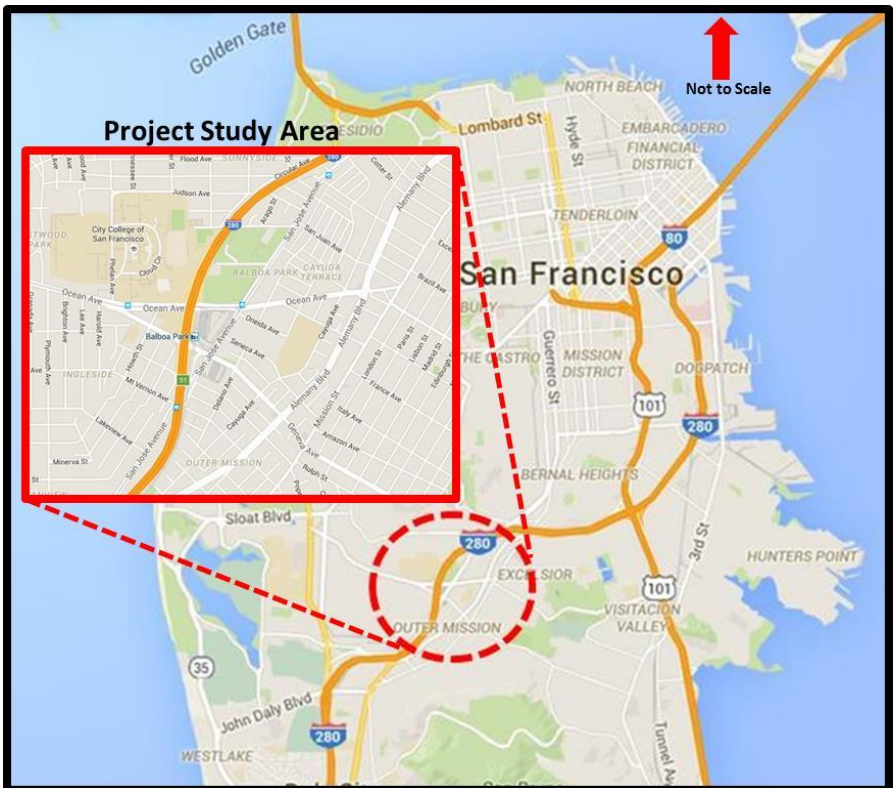

Figure 1-1 Site Vicinity Map

1.1 Purpose of this Study

The purpose of this Preliminary Geotechnical Report (PGR) is to review and document subsurface information relevant to design of the proposed retaining wall, and to assess or identify potential geotechnical project impacts. The information in this document will provide input to the project's conceptual design. A more comprehensive geotechnical study will be needed during project design phase.

1.2 Project Scope of Work

The scope of work for this study included:

- Review of available as-built bridge drawings, logs of test borings (LOTBs), geologic maps, fault maps and geologic hazard maps, and other existing information.
- Preparation of this report, including:
  - Development of preliminary seismic design criteria;
  - Description of site geology and evaluation of potential geologic hazards;
  - Assessment of subsurface conditions based on available information;
  - Identification of potential geotechnical impacts on the project;
  - Discuss feasible wall and foundation types;
  - Discuss feasible standard pole foundation types for electroliers and traffic signals associated with the off-ramp improvements;
  - Discuss scour and corrosion potential;
  - Construction considerations; and
  - Recommendations for additional geotechnical and geological studies needed for final design.

1.3 Project Description

The realignment and widening of the existing southbound I-280 off-ramp at Ocean Avenue to two lanes will require the construction of a retaining wall approximately 670 feet long with a maximum height of 20 feet. Construction of the retaining wall will require excavation to a maximum depth of 25 feet. All roadway components will be constructed within the existing State right-of-way. A temporary construction easement (TCE) of up to approximately 20 feet by 200 feet and an underground easement for retaining wall tie backs and/or retaining wall foundations may be required along the western side of the existing ramp. Tiebacks may extend below the footprint of an existing City College building and parking lot, but the design will minimize any impacts. Figure 1-2 presents the proposed layout of the off-ramp realignment.

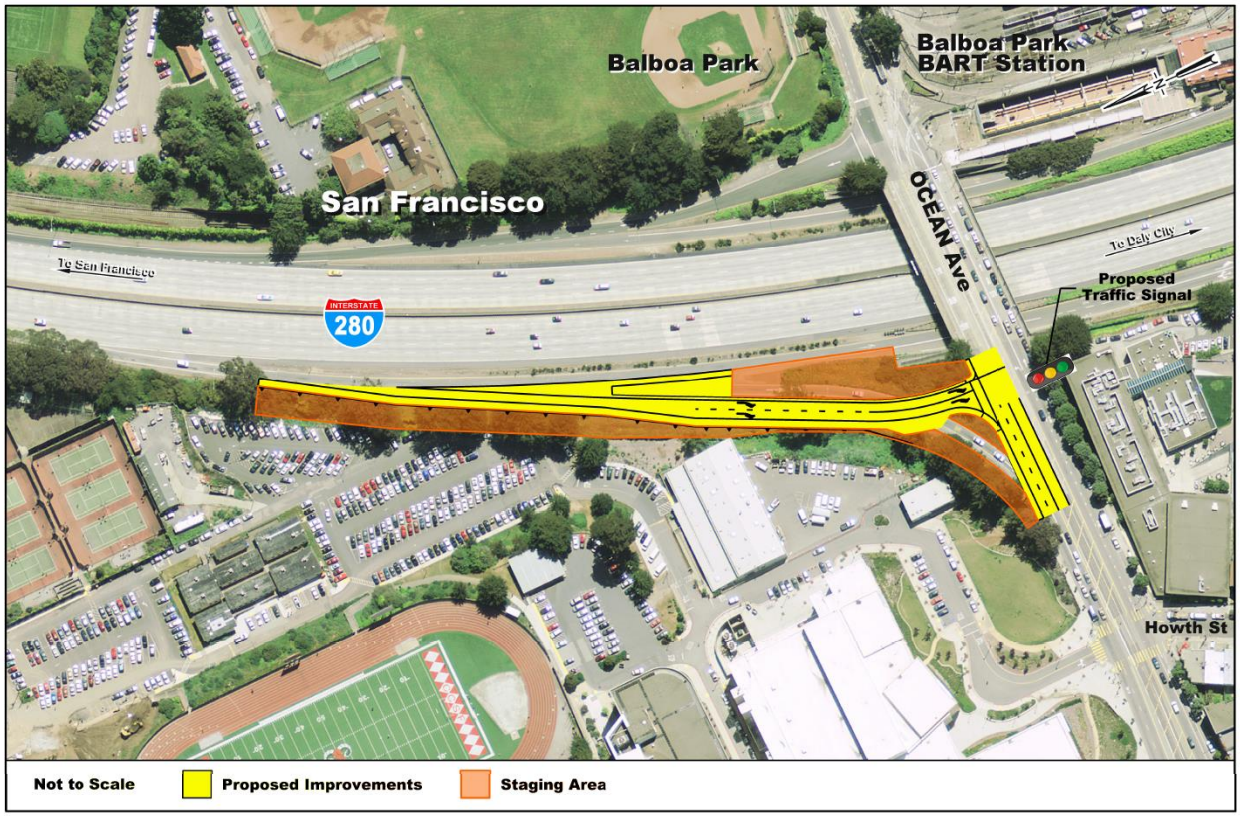

Figure 1-2 Project Layout

2.0 FIELD INVESTIGATIONS AND LABORATORY TESTING PROGRAM

2.1 Field Investigations

2.1.1 1962 LOTB

Five borings performed for the 1961 investigation of the Ocean Avenue Overcrossing (OC) are shown on the LOTB sheet dated July 16, 1962; a copy of the LOTB is presented in Appendix A. The LOTB sheet includes logs of two rotary wash borings, B-1 and B-3, extending to depths of about 30 and 50 feet, respectively. The other three penetration boings, B-2, B-4 and B-5, extended to depths of about 25 to 50 feet. No groundwater was encountered at the time of drilling.

Three borings were performed for the retaining wall along "OF" line in 1961. A copy of the LOTB is presented in Appendix B. The LOTB sheet includes logs of one rotary wash boring, B-2 that extended to a depth of about 30 feet, and two penetration boings, B-1 and B-3 that reached depths of about 20 and 18 feet, respectively. No groundwater was encountered at the time drilling.

Soil samples were collected from the rotary wash borings using a standard penetration sampler (SPT) with an inside diameter of 1.4 inches; blow counts were recorded, as shown on the LOTBs.

2.2 Laboratory Testing Program

No laboratory test data are shown on the as-built LOTBs.

3.0 GEOLOGIC SETTING

3.1 Surface Conditions and Site Geology

3.1.1 Surface Conditions and Topography

The Ocean Avenue OC is a four-span structure with backfilled abutments and three bents; Bents 2 and 4 are situated on the outside shoulders and Bent 3 is situated along the median of I-280. This segment of I-280 is depressed below the surrounding grade. The BART Balboa Park Station is located east of I-280 at Ocean Avenue; the City College of San Francisco (CCSF) is located west of the off-ramp. The exiting off-ramp is positioned on a gradual 3 to 10 percent up-gradient situated on a cut with a side slope of about 1½:1 (horizontal: vertical).

3.1.2 Site Geology

The project site is located on the San Francisco peninsula within the Coast Ranges geomorphic province, with northwesterly trending ridges and valleys and localized hills such as Potrero Hill. Jurassic- to Cretaceous-aged Franciscan Complex bedrock (primarily deformed and fractured sedimentary and volcanic, with minor metamorphic, rocks) is overlain by Quaternary sedimentary deposits.

The site is located in hilly terrain comprising Colma Formation, Pleistocene-age near-shore and beach deposits consisting of consolidated, well-sorted, fine- to medium-grained sand, overlying Franciscan Complex deposits consisting of pervasively sheared sandstone, shale and serpentinite, and northeast-dipping greywacke sandstone with minor shale (Figure 3-1). A relatively small (approximately 5-acre) Pleistocene-age slope debris and ravine fill deposit consisting of silty or clayey sand or gravel overlies the Colma Formation directly west of the project location on the City College of San Francisco campus. Artificial fill deposits consisting of various combinations of gravel, sand silt, clay, rock fragments, organic matter, and man-made debris are mapped approximately 1 mile west of the project site (Bonilla 1998).

3.2 Seismic and Geologic Hazards

3.2.1 Regional Tectonic Setting and Seismicity

The main geologic hazards at the site are related to seismic shaking due to large earthquakes. The San Francisco Bay Area is crossed by numerous active faults associated with the San Andreas Fault System that forms the boundary between the North American and Pacific tectonic plates. The site is located between the San Andreas and Hayward-Rogers Creek faults, two major, historically active faults (Figure 3-2). The Working Group on California Earthquake Probabilities (WGCEP) estimates there is a 33% probability that a magnitude 6.7 or greater earthquake will occur on the Northern San Andreas fault and a 32% probability that a magnitude 6.7 or greater earthquake will occur on the Hayward-Rodgers Creek fault within 30 years of 2014 (WGCEP, 2015). Large earthquakes on either of these two faults or any of the other main Bay Area faults can be expected to subject the site to strong ground shaking. The City College fault, a northwest-trending fault which crosses the project footprint (Bonilla, 1998), has shown no Quaternary displacement and is, therefore, considered inactive (CCSF, 2004). The City College fault is not mapped as an Alquist-Priolo special studies zone for surface fault rupture hazard (California Geologic Survey, 1982).

3.2.2 Surface Fault Displacement and Ground Shaking

The project site is not crossed by any known active faults (CGS, 2007); therefore, surface rupture due to faulting is not expected to occur at the site. However, the closest active fault, the San Andreas fault (4.1 miles), creates a high risk for strong ground shaking from fault movement. The intensity of the ground shaking is dependent upon the size of the earthquake, the distance of the epicenter from the site, the direction the earthquake propagates along the fault, and the site geologic conditions.

3.2.3 Landslides

No landslides are mapped on the California Geological Survey (CGS) Landslide Inventory. The CGS Map Sheet 58 indicates the area surrounding the Ocean Avenue off-ramp is mapped as Class 0 and Class III, which are relatively low on the Class 0 to Class X rating scale. Based on the dense to very dense sand and gravel encountered in the 1961 explorations, AECOM considers the site materials are not susceptible to landsliding, either seismically induced or otherwise. Therefore, the hazard of landsliding at the site is considered to be low.

3.2.4 Liquefaction

Liquefaction is a phenomenon whereby sediments temporarily lose shear strength and collapse. This condition is caused by cyclic loading during earthquake shaking that generates high pore water pressures within the sediments. The soil type most susceptible to liquefaction is loose, cohesionless, granular soil below the water table and within about 50 feet of the ground surface. The soil underlying the project site is consolidated sand of the Colma Formation, and the site is not mapped as a liquefaction hazard zone by the State of California (CGS, 2000a). Google Earth aerial photo review (imagery date April 5, 2016) revealed no streams or river channels within ½ mile of the project area footprint. Therefore, there is little probability the site will be affected by seismically-induced lurch cracking or lateral spreading toward incised stream banks. Nonetheless, a detailed liquefaction evaluation should be completed during the project design phase at planned foundation locations.

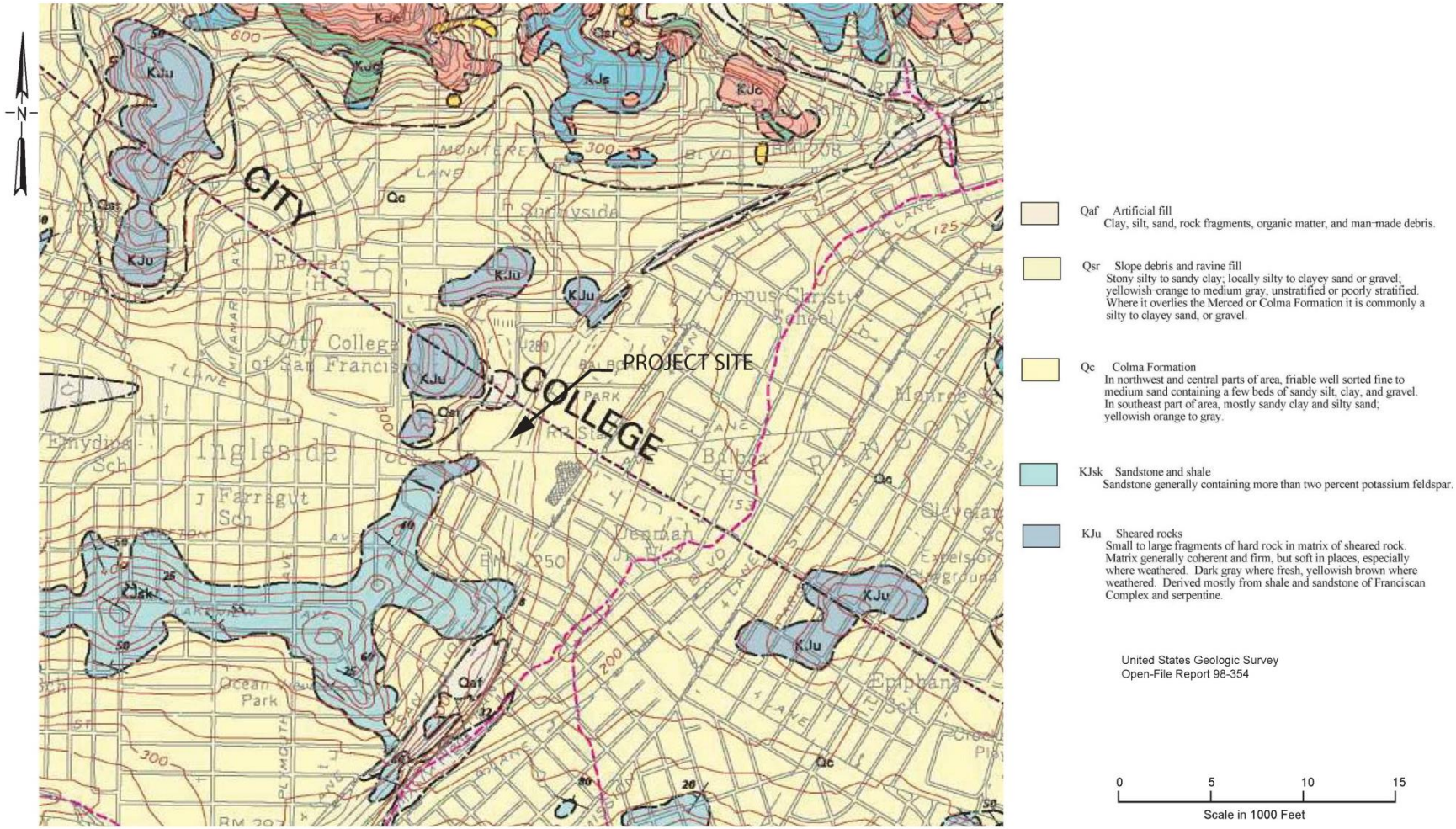

Figure 3-1 Site Geology

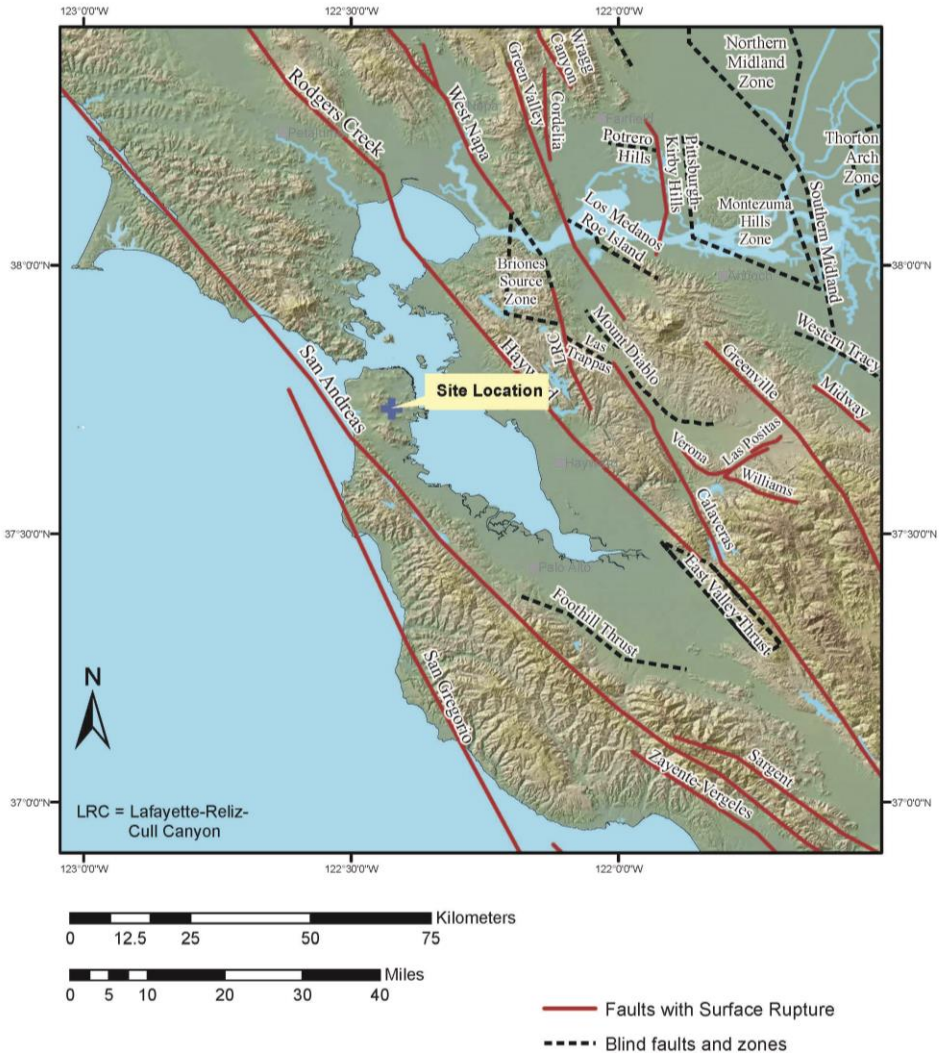

Figure 3-2 Map of Regional Seismic Sources

3.3 Settlement

Settlement can occur quickly when soil is loaded by a structure or by the placement of fill on top of the soil, and it can also occur gradually when soil pore water pressures, increased by vertical loading, gradually dissipate over time. With primarily granular deposits and weathered bedrock at the site, the risk of adverse impact from consolidation settlement due to fill placement is considered low.

Seismically-induced (dry) settlement occurs when loose granular soils above the water table increase in density as a result of earthquake shaking. The soil densification can result in differential settlement because of variations in soil composition, thickness, and initial density. Surficial loose to slightly compact granular deposits were encountered in upper 5 to 10 feet in borings drilled in 1961 for the Ocean Avenue OC and retaining wall. These granular deposits

may be subject to cyclic densification during strong ground shaking, resulting in compaction settlement. Evaluation of compaction settlement should be completed during design.

3.4 Flooding

Federal Emergency Management Agency has not completed a study to assess flood hazard for the City and County of San Francisco in the vicinity of the site. However, because of the relatively high ground elevation of the site, the risk of flooding in natural water courses is considered very low.

3.5 Subsurface Conditions

3.5.1 Soil Conditions

As-built plans of the original bridge construction present elevations based on the NGVD 29 datum. Using the conversion calculation tool CORPSCON (United States Army Corps of Engineers, 2010), the datum shift at the bridge site to NAVD 88 datum is +2.80 feet.

Five test borings were advanced for the design of the Ocean Avenue OC by Caltrans in May 1961; three additional borings were drilled for the retaining wall along the "OF" line, generally located along Bent 2, in December 1961. The rotary wash borings generally encountered medium dense sands and gravels to elevations ranging from 210 to 225 feet NGVD 29 (212.8 to 227.8 feet, NAVD 88); the upper 7 feet of soil in Boring B-2 for the retaining wall is described as compact crushed rock with silty sand fill and the upper 7 feet of soil in Boring B-3 for the OC is described as loose. Very dense sand was encountered beneath the surficial sands to approximately Elevation 218 feet to below Elevation 174 feet NGVD 29 (220.8 to 176.8 feet NAVD 88). Franciscan bedrock was encountered as shallow as Elevation 218 feet NGVD 29 (220.8 feet NAVD 88).

3.5.2 Groundwater Conditions

No groundwater was encountered in the 1961 borings. Groundwater is estimated to be within 10 to 30 feet of the ground surface in this area based on historic high ground water contours (CGS, 2000b).

4.0 SCOUR EVALUATION

No creeks or streams are within a 1 mile radius of the site. Therefore, scour at the proposed retaining wall foundation is not a concern.

5.0 CORROSION EVALUATION

Corrosion test results were not included with the available as-built information and should be provided as part of final design.

6.0 PRELIMINARY SEISMIC RECOMMENDATIONS

Based on Caltrans ARS Online tool (v 2.3.06), the active faults closest to the Ocean Avenue OC at I-280 are the San Andreas fault (Peninsula and North Coast segments) and the San Gregorio section of the San Gregorio fault. Table 6-1 presents a summary of seismic source parameters for the three closest active faults.

Table 6-1 Seismic Source Parameters

Fault	Type	**M**Max[1]	Distance (miles)[2]	Near Field Effects?
San Andreas (Peninsula)	strike-slip	8	4.1	Y
San Andreas (North Coast)	strike-slip	8	10.5	N
San Gregorio	strike-slip	7.4	8.0	N

1 Maximum moment magnitude of fault (the largest earthquake a fault is capable of generating).

2 Fault distances taken from Caltrans ARS are intended for use in ground motion evaluation; these distances should not be used for project scale fault location.

Based on Caltrans ARS Online and utilizing the tool on the US Geologic Survey Probabilistic Seismic Hazard Analysis Interaction Deaggregation website, the following ground motion parameters were established for an average shear wave velocity, $V_{s30,}$ in the upper 100 feet (30 meters) of soil/rock profile of 1,312 feet/second (400 meters/second) and probability of exceedance of 5 percent in 50 years:

- Peak ground acceleration = 0.7 g (Caltrans adopted a spectral acceleration at 0.01 second)
- Magnitude, **M**Max = 8

Figure 6-1 presents acceleration response spectra for preliminary design. For the design phase, V_{s30} should be based on site specific measurements obtained in exploratory borings or cone penetration tests (CPTs) planned for foundation investigations as discussed in Section 10.

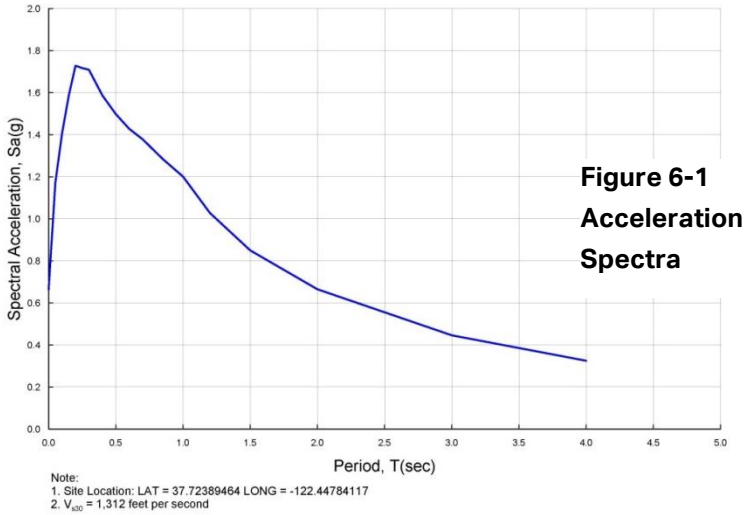

Figure 6-1 Preliminary Acceleration Response Spectra

7.0 AS-BUILT FOUNDATION DATA

Based on the as-built data from Caltrans, the existing Ocean Avenue OC (Bridge No. 34-94) consists of a three-lane, four span bridge structure that crosses over I-280. The OC structure was constructed in 1964 and subject to seismic retrofit of the bents in 1995. The OC is about 245 feet long and is a cast-in-place reinforced concrete box girder structure with reinforced concrete bents, columns and cantilever abutments. The as-built general plan and foundation plan for the original OC construction and LOTBs are presented in Appendix A.

The structure is supported on spread footings, with bottom of footing elevations listed in Table 7-1.

Table 7-1 Footing Elevations of Existing Ocean Avenue OC

Location	Range of Elevations[1] of Bottom of Footing (feet)
Abut 1	210
Bent 2	209
Bent 3	208
Bent 4	205
Abut 5	205

Note: 1 – Elevations based on 1962 as-built plans (NGVD 29)

The spread footings were designed for an allowable soil pressure of 3 tons per square foot for foundations bearing at or below Elevation 210 feet (NGVD 29).

8.0 PRELIMINARY FOUNDATION RECOMMENDATIONS

Based on AECOM's review of the available as-built drawings and soil boring information for the adjacent Ocean Avenue OC, the principal geotechnical considerations are:

- Static and seismically induced lateral earth pressures imposed on the retaining wall;
- Global stability of the proposed widened off-ramp and associated retaining wall; and
- Settlement analysis of the proposed widened off-ramp and associated retaining wall.

For a site peak ground acceleration of 0.7 g, Caltrans' design criteria require a minimum seismic coefficient for dynamic earth pressure of 0.23 g. This is greater than the value of 0.2 g used to develop the Caltrans Standard Plan retaining walls. Therefore, the wall design will require submittal to Caltrans Structures Design.

Based on the dense sands and very stiff Franciscan formation material that will likely be present at the foundation level, spread footings should be capable of supporting a cantilever type retaining wall similar to the Caltrans Standard Plan Type 1 wall. However, if the wall footing sized for seismic loading encroaches on the right-of-way line, a pile supported cantilever type retaining wall may need to be considered. Based on as-built LOTBs, 24-inch-diameter cast-in-drilled-hole (CIDH) piles extending into the very dense sand/Franciscan bedrock to depths of about 30 to 40 feet below bottom of footing should be capable of providing support for the retaining wall. CIDH piles should also pose less vibration and noise impact than driven piles to nearby City College facilities during construction. Alternatively, a ground anchor wall may be feasible.

Any loose sand fill encountered along the wall alignment, such as that revealed in the upper 7 feet of 1961 Boring B-3, should be removed and replaced with well compacted structure backfill.

When site-specific exploratory and laboratory test data become available during the design phase, global stability, overturning and sliding evaluations for the retaining wall should be performed. Settlement analysis should also be conducted to evaluate the influence of embankment loads on the wall foundation.

Standard Plan (RSP ES-7N) CIDH pile foundations should be feasible to support proposed electroliers and traffic signals associated with the off-ramp improvements.

9.0 CONSTRUCTION CONSIDERATIONS

Groundwater was not encountered in the 1961 borings, but is expected to be present at depths of 10 to 30 feet in the project vicinity. CIDH pile excavation as well as spread footing excavation could encounter groundwater. Collection of groundwater elevation data should be part of the field investigation program. These data will provide the basis to assess whether construction dewatering would be required.

Because of the close proximity to the City College facilities along the west side of the existing ramp, temporary shoring will likely be required to construct the proposed wall and backfill behind it. Therefore, design plans and specifications should incorporate the requirements for construction shoring. Consideration also will need to be given to tieback placement, if that alternative were to be used.

10.0 ADDITIONAL INVESTIGATIONS

AECOM recommends the following investigation approach be taken prior to developing final recommendations for the geotechnical aspects of the foundation design for the off-ramp retaining wall.

10.1 Task 1 - Field Exploration

The following exploration program is recommended to supplement existing available data and to investigate the site specific subsurface conditions along the proposed retaining wall alignment.

1. Advance and sample four exploratory borings along the length of the wall to depths of 60 to 80 feet, using rotary-wash or hollow-stem equipment; the recommended boring depth range is based on the potential need for deep foundations that cannot be confirmed prior to site exploration. If a wall alternative using tieback anchors is to be considered, exploration from the top of slope or horizontally into it may be required. The final depths of explorations should be adjusted in the field if relatively thick loose sandy deposits, soft clays or other adverse subsurface conditions are encountered during drilling.
2. If groundwater is encountered, measure depth when first encountered and at end of drilling.
3. If hard rock is encountered, core to a depth at least 10 feet into competent rock.

10.2 Task 2 - Corrosion Testing and Analysis

Corrosion testing and analysis should be performed in general accordance with Caltrans 2015 requirements to address the corrosion engineering aspects of spread footings, CIDH piles, and tieback anchors for the proposed earth retaining structure.

10.3 Task 3 - Laboratory Testing

All samples obtained from the field investigation should be reviewed and selected samples should be tested in the laboratory to confirm the field classifications. Test results should be used to estimate the engineering parameters of the materials encountered. These tests may include moisture content, dry unit weight, unconfined compressive strength, plasticity index and grain size distribution.

10.4 Task 4 - Engineering Analysis

Based on the results of the field investigation and laboratory testing, as well as engineering judgment and experience, recommendations should be developed for the following geotechnical aspects of project design:

- Spread footings
  - Bearing capacity and overturning resistance
  - Sliding resistance
  - Global wall stability

  - Settlement
- Deep foundations (if the required footing width encroaches beyond Caltrans right-of-way
  - Vertical capacity
  - Design tip elevations
  - Resistance to lateral loads
- Minimum unbonded ground anchor length and ground anchor inclination
- Corrosion potential
- Earthquake information consistent with Caltrans Response Spectra Design Techniques
- Assessment of the potential for earthquake induced settlement (dry) and liquefaction
- Construction considerations

10.5 Task 5 - Reporting

The report should be prepared in accordance with Caltrans requirements, including Foundation Reports for Earth Retaining Systems (ERS), June 2017.

11.0 REFERENCES

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12.0 LIMITATIONS

This PGR is intended for conceptual design purposes only. The opinions, conclusions and preliminary recommendations presented herein are based on available subsurface information presented on the as-built LOTBs. The preliminary recommendations presented in this report are based on the assumption the subsurface and geologic conditions do not deviate substantially from information contained in the as-built LOTBs. Available site specific exploration and analysis should be completed prior to the development of final design recommendations.

Existing facilities, utilities, soils/bedrock conditions, road/structure distress, slope distress or groundwater/seepage conditions other than those noted herein have not been considered in the preparation of this report. Locating utilities and evaluating potential utility interference is outside the scope of this report. Individuals utilizing this report should inform AECOM if they are aware of any additional facilities or site conditions so that their presence and impact upon the project (or vice-versa) can be properly evaluated and recommendations modified to address geotechnical issues as necessary.

Specific review and investigation for environmental issues and subsurface environmental contamination were beyond the scope of our services.

The opinions and preliminary recommendations presented in this report were developed with the standard of care commonly used by other professionals practicing at the same time, within the same locality and under the same limitations. No other warranties are included, either express or implied, as to the professional advice included in this report.

Sincerely,

Anne-Marie Moore, PE, GE 2574

STORMWATER DATA INFORMATION

1. Project Description

- San Francisco County Transportation Authority (SFCTA) in cooperation with the California Department of Transportation (Caltrans) proposes to modify the existing southbound I-280 off-ramp to Ocean Avenue and Geneva Avenue. The Project vicinity map is provided in the Required Attachments. The current configuration of the southbound I-280 off-ramp is a single lane free right turn onto Ocean Avenue and a continuation of the ramp to Geneva Avenue. Two alternatives are under consideration for modifications to the Ocean Avenue off-ramp; a No Build Alternative and a Build Alternative. These two alternatives are described below:

    1. *No Build – Alternative 1*

       The No Build Alternative proposes no modifications to the existing I-280 configuration other than routine maintenance and rehabilitation and the currently planned and programmed projects within the area.

    2. *Build – Alternative 2*

       The Build Alternative includes modifications to the existing southbound I-280 off-ramp at Ocean Avenue. This alternative includes the following components:

       - Elimination of the existing free-right turn lane for vehicles exiting the southbound I-280 off-ramp just prior to the Ocean Avenue/Howth Street intersection
       - Realignment and widening of the existing Ocean Avenue off-ramp to a two-lane T-intersection at Ocean Avenue
       - Installation of a traffic signal at the realigned southbound I-280 off-ramp/Ocean Avenue intersection to provide controlled crossing for pedestrians and bicyclists.

- The realignment and widening of the existing southbound I-280 off-ramp at Ocean Avenue to two lanes will require the construction of a retaining wall approximately 700 feet long with a maximum height of 20 feet. Construction of the retaining wall will require excavation to a maximum depth of 25 feet. All roadway components will be constructed within the existing State right-of-way. A temporary construction easement (TCE) of approximately up to 20 feet by 200 feet and an underground easement for retaining wall tie backs and/or retaining wall foundations may be required along the western side of the existing ramp. Tiebacks may extend below footprint of the existing San Francisco City College (CCSF) building, but the design will minimize any impacts.
- The purpose of this project is to improve safety along Ocean Avenue at the southbound I-280 off-ramp intersection.
- The current configuration of the southbound I-280 off-ramp intersection with Ocean Avenue creates potential conflicts between multi-modal users.
- The current configuration of the southbound I-280 off-ramp is a single lane, free-right turn onto westbound Ocean Avenue just prior to the intersection with Howth Street. The ramp becomes a new rightmost lane as it joins westbound Ocean Avenue. Vehicles on westbound Ocean Avenue that are attempting to shift to the right lane immediately past the ramp merge area to turn right at Howth Street into the CCSF are required to merge with vehicles exiting the off-ramp over a short distance of approximately 150 feet.
- The Project area supports a high volume of pedestrian traffic due to the vicinity of the Balboa Park Bay Area Rapid Transit (BART) and Muni stations. Additionally, there are pedestrian destinations within the vicinity of the Balboa Park neighborhood, such as the CCSF, Lick-

Wilmerding High School, Balboa Park, and neighborhood retail along Ocean Avenue to the west of the college. The current ramp configuration requires pedestrians traveling along the northern side of Ocean Avenue to cross the southbound I-280 off-ramp at an uncontrolled crosswalk where vehicles exit the freeway at high speeds.

- Ocean Avenue is the primary east-west bicycle route in the area, with a mix of Class II bike lanes and Class III bicycle routes in each direction. The San Francisco Municipal Transportation Agency's draft multi-modal hierarchy[1] identifies this segment of Ocean Avenue as a highest priority segment of the bicycle network, based on demand and hilliness. The current ramp configuration requires westbound cyclists attempting to stay in the rightmost lane to merge into the lane populated by vehicles exiting the freeway at high speeds.
- According to the San Francisco Department of Public Health TransBASE database, between 2005-2015 there were two pedestrian injuries, four bicycle injuries, and six vehicle injuries in the area at the intersection of Ocean/SB I-280/Howth.[2] This intersection has been identified as a "High Injury Intersection" in San Francisco's Vision Zero Action Strategy.[3]
- This segment of Ocean Avenue has also been identified as part of the Vision Zero "High Injury Network," and is specifically a high injury corridor for cyclists. The Vision Zero Action Strategy calls for redesign of corridors & intersections with treatments to increase safety and reduce fatal crashes by improving visibility, calming traffic speeds, and encouraging road user compliance. Furthermore, the intersection displays several of the issues identified by the Caltrans Complete Intersections Guide[4] as affecting free-flow ramps, including motorists traveling at high speed and unlikely to yield, acute intersection angle limiting visibility, and bicyclists forced to weave. This guide recommends a T-intersection as one of the top recommended treatments to improve multi-modal safety.
- The disturbed soil area (DSA) was calculated based on the net new impervious area (NNI), replaced impervious surface, the pervious area along the proposed retaining wall, and other pervious areas along the construction footprint.
- The existing impervious area for the ramp only is 0.53 acres (ac).
- The added impervious area is 0.49 ac.
- The new impervious surface is 0.60 ac and the removed impervious area is 0.21 ac.
- Therefore, the NNI is 0.28 ac.
- The replaced impervious surface is 0.32 ac.

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[1] Draft Multi-Modal Hierarchy. San Francisco Municipal Transportation Agency, 2016: not available online.

[2] TransBASE: Linking Transportation Systems to Our Health. San Francisco Department of Public Health, 2016: http://transbasesf.org/transbase/

[3] Vision Zero San Francisco Two-Year Action Strategy 2017-18. City and County of San Francisco, 2016: http://visionzerosf.org/about/two-year-action-strategy/

[4] Complete Intersections: A Guide to Reconstructing Intersections and Interchanges for Bicyclists and Pedestrians, Section 9.1. California Department of Transportation, 2010: http://www.dot.ca.gov/trafficops/ped/.

- The DSA is 2 ac, which was based on any location that will have roadway removal, construction, and grading.

2. Site Data and Stormwater Quality Design Issues

- The Project is historically in the South Bay Hydrologic Unit and the San Mateo Bayside Hydrologic Sub-area. The Project is located within the Islais Creek watershed. Streams historically flowed east and discharged into the Islais Creek channel. Streams in the watershed have been superseded by the sewer systems managed by the San Francisco Public Utilities Commission (SFPUC).
- There are no streams within the Project limits. Stormwater drainage systems now reroute runoff into the combined sewer system.
- Runoff would be treated at the SFPUC's Southeast Treatment Plant approximately four miles from the Project site, then discharged into the Islais Creek channel and eventually the San Francisco Bay. The SFPUC is currently upgrading the Southeast Treatment Plant to improve its operation and treatment processes.
- Because stormwater runoff enters the combined sewer system and is treated at the Southeast Treatment Plant, there are no creeks on the 303(d) list.
- The District 4 Work Plan (Caltrans, October 2015) does not identify any drinking water reservoirs aquifer or groundwater recharge facilities within or adjacent to the Project.
- The Project is located mostly within the Caltrans right-of-way (R/W) and is covered by Caltrans' *Stormwater Management Plan*.
- Because the Project is within the combined sewer system and would not disturb soils and add impervious area on Ocean Avenue, stormwater management requirements under the Phase II Small MS4 General permit and the *San Francisco Stormwater Management Requirements and Design Guidelines* do not apply.
- The Project does not anticipate impacts to jurisdictional waters, and will not require a permit under Section 401 of the Clean Water Act (CWA) through the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) or a Section 404 permit of the Clean Water Act, issued by the U.S. Army Corps of Engineers.
- There is a potential that aerially deposited lead (ADL) may be present in shallow soils within approximately 30 feet of the edge of the pavement in highway corridors as a result of past uses of ADL in gasoline. The Project will not re-use ADL-contaminated soils during construction.
- There are no regional water quality issues or areas of special biological significance within the Project area.
- San Francisco's Mediterranean climate is characterized by warm summers and mild wet winters. The average annual high temperature for the San Francisco Oceanside station is 61.5 degrees Fahrenheit (°F) and the average annual low temperature is 49.4°F.
- Rain falls mainly between October and April; little or no rain falls during the summer months. The average annual precipitation in the Project vicinity is 19.99 inches with monthly averages exceeding 1 inch between October and April.
- According to the Natural Resources Conservation Service, the soils are classified as Urban Land and Urban Land-Orthents, smoothed complex, 5 to 50 percent slopes. Urban Land is defined as land covered by asphalt, concrete, buildings, and other structures. This soil occurs in areas of industrial and business districts, along with home sites and recreational

development. Site soil type and topography present no special circumstances for unique or bolstered soil stabilization practices.

- According to the California Department of Water Resources' (DWR's) *Groundwater Bulletin 118*, the Project is within the Islais Valley Groundwater Basin, which has a surface area of 5,930 ac (9.2 square miles). The Islais Valley Groundwater Basin has the following existing beneficial uses: industrial service water supply, industrial process water supply, and agricultural water supply.
- Groundwater level data was obtained from the DWR's Groundwater Level Interface. Based on the recent groundwater level data from a well approximately 0.42 miles southeast of the Project footprint, the depth to groundwater is approximately 49 feet. The Project does not anticipate impacts to groundwater levels. This information may change when the geotechnical report for this Project is released.
- The Project limits are located in the Coast Ranges Geomorphic Province of Northern California. The regional structure of the Coast Ranges consists of a northwest-trending folds and faults associated with the San Andreas Fault Zone. The Project topography generally slopes from west (CCSF) to east (Balboa Park).
- All Project components would be constructed within existing state R/W. A TCE of approximately 20 feet by 200 feet may be required along the existing ramp, to the west. No structures would be impacted by the TCE.
- San Francisco's Citywide Zoning Map shows that the land use is generally public: CCSF in the northwest quadrant, Balboa Park in the northeast quadrant, and Balboa Park BART/Muni stations in the southeast quadrant. The southwest quadrant has a sliver of public: bicycle/pedestrian path parallel to I-280 southbound. Most of the southwest quadrant is RH-1 Residential (One Unit Per Lot) with some RH-2 Residential (Two Units Per Lot) and NCT Neighborhood Commercial Transit District.
- To avoid grading new slopes steeper than 2:1 and to avoid the need for R/W acquisition, retaining walls will be constructed to achieve the proposed Project widening within the existing Caltrans R/W.

3. Construction Site Best Management Practices (BMPs) to be used on Project

- Because the Project would disturb more than one acre of soil, the Project is subject to the Construction General Permit (CGP), and a risk assessment is required.
- The Project Risk Level is determined from the sediment risk and the receiving water risk.
- The R factor (61.36) was determined using the U.S. EPA's Rainfall Erosivity Factor Calculator.
- The K factor (0.32) was obtained from the SWRCB's K Factor Map.
- The Project's cross sections provided by AECOM were used to calculate LS factor (1.29).
- The product of the R, K, and LS factors is 25 tons/ac; therefore, the sediment risk is medium.
- There are no streams within the Project limits because stormwater drainage systems reroute runoff into the combined sewer system. For a project to have a high receiving water risk, receiving waters must have the existing beneficial uses of cold freshwater habitat, fish migration, and fish spawning. Because the Project does not meet all of the criteria, the receiving water risk is low.

- Based on the combined medium sediment risk and low receiving water risk, this Project is classified as Risk Level 2. The Project Risk Level would be further evaluated and verified during the Plans, Specifications, and Estimates phase.
- A Storm Water Pollution Prevention Plan (SWPPP) would be required from the Contractor and approved by the Caltrans Resident Engineer prior to the start of construction. The SWPPP includes all monitoring and sampling procedures and instructions, location map, forms, and checklist as required by the CGP (Order No. 2009-009-DWQ, as amended by 2010-0014-DWQ and 2012-0006-DWQ). It would identify BMPs to reduce water quality impacts during construction. The SWPPP would emphasize: 1) standard temporary erosion control measures to reduce sedimentation and turbidity of surface runoff form disturbed areas, 2) personnel training, 3) scheduling and implementation of BMPs, 4) identification of BMPs for non-stormwater discharge such as fuel spills, and 5) mitigation and monitoring throughout the construction period.
- Because the Project would be potentially defined as a Risk Level 2 project, a Rain Event Action Plan (REAP) is required in accordance with the CGP. A REAP would be developed by a Qualified SWPPP Practitioner (QSP) at least 48 hours prior to any likely precipitation event. The quantities and costs for a REAP would be determined during the design phase.
- As this Project would be potentially defined as a Risk Level 2 project, stormwater sampling is required at the first hour of any new discharge and during the first and last hour of every day of normal operations characterizing discharges associated with construction activity from the entire Project's disturbed area. A minimum of three samples per day per outfall is required.
- Visual site monitoring must be conducted on all construction sites, including routine weekly BMP inspections, rain event triggered inspections, and quarterly non-stormwater monitoring. In addition, non-visible pollutant sampling would be performed at all stormwater runoff and non-storm water pollutant discharge points.
- Numeric Action Levels (NALs) for pH and turbidity are applicable to the Project. An NAL Exceedance Report must be submitted to the State Water Resources Control Board no later than 10 days after the storm event if any of the samples exceed 250 NTU for turbidity or exceed a pH less than 6.5 or greater than 8.5.
- The Project includes incidental soil disturbance related to the construction of the proposed retaining wall and proposed realignment and widening of the off-ramp.
- The short construction period (no longer than 1 year) will further reduce the potential for water quality impacts.
- Potential temporary impacts to water quality can be avoided or minimized by implementing standard BMPs recommended for a particular construction activity.
- Soil stabilization measures include move-in/move-out, temporary cover, and temporary fence (Type ESA).
- Sediment control measures include placing linear sediment barriers such as silt fence at the toe of all excavation and embankment slopes, as well as at the top of all cut slopes.
- Slope interruption devices such as fiber rolls would be installed at intervals as specified in the Caltrans Standard Specifications.
- Storm drain inlet protection would be deployed throughout the Project at all existing and permanent drainage inlets.

- There is a potential for wind erosion. Off-site tracking of sediment would be limited by placing stabilized construction entrances in combination with regular street sweeping and vacuuming. Locations of these tracking control BMPs will be considered during the design phase.
- Concrete washouts are anticipated for concrete work, for example, construction of the retaining wall and Portland cement concrete work.
- A lump sum cost for job site management would be included in the cost estimate prepared during the next phase, which consists of additional BMP measures (not already paid for by individual bid line items) for controlling potential sources of water pollution before they enter the stormwater systems or watercourses. In addition, job site management includes training employees and subcontractors. Training for construction personnel must be provided and cover the proper selection, deployment, and repair of construction site BMPs used within the Project limits. Job site management would include: temporary non-stormwater management and temporary waste management and materials pollution control.
- Dewatering is not anticipated during the construction of this Project.
- Temporary non-stormwater management consists of:
    1. Water control and conservation
    2. Illegal connection and discharge detection and reporting
    3. Vehicle and equipment cleaning
    4. Vehicle and equipment fueling and maintenance
    5. Paving, sealing, saw cutting, and grinding operations
    6. Thermoplastic striping and pavement markers
    7. Concrete curing and concrete finishing
- Temporary waste management and materials pollution control consists of:
    1. Spill prevention and control
    2. Material delivery, storage, and use
    3. Stockpile management
    4. Waste management
    5. Hazardous waste management
    6. Contaminated soil
    7. Sanitary/septic waste management
- The Project discharges into the Caltrans drainage systems, which then discharge into the SFPUC combined sewer; therefore, during the PS&E phase, refer to the SFPUC requirements, which may be more stringent than Caltrans.

4. Maintenance BMPs

- Storm drain stenciling is required along roads and streets legally accessible by pedestrians or bicyclists. Stenciling should be inspected and replaced when illegible. For most of the Project limits, stenciling is not required because pedestrians are prohibited along the freeway.

5. Other Water Quality Requirements and Agreements

- There are no key negotiated understandings or agreements with SFBRWQCB pertaining to this Project, and none are anticipated.
- This Project will require notification to the State Water Resources Control Board (SWRCB) via the Stormwater Multi-Application Report Tracking System (SMARTS). Project registration documents will need to filed, and a WDID number will be assigned to this Project.

6. Permanent BMPs

Rapid Stream Assessment

- Because the Project does not discharge to any stream, a Rapid Stream Assessment is not required.

Design Pollution Prevention (DPP) BMP Strategy

- The Project does not encroach, cross, realign, or cause hydraulic changes to a stream that will affect downstream channel stability. Slopes are planned to be no greater than 2:1 (H:V), compacted as specified in the Caltrans Standard Specifications, and stabilized using the permanent erosion control measures to be specified during the design phase.
- The increase of impervious area from the Project has the potential to result in an increase to velocity, volume, and potential sediment load of downstream flow.
- Downstream effects are minimized through preservation of existing vegetation, and the use of erosion control measures along slopes and disturbed areas to decrease erosion through permanent stabilization and vegetation establishment.
- Flared end sections, tees, and rock slope protection should be placed at the downstream end of proposed culverts to dissipate and disperse the energy of runoff as it flows out of the culverts.
- Because the Project drains into a combined sewer, hydromodification measures are not required.

Treatment BMP Strategy

- The Project is not required to have treatment BMPs because discharges would flow downstream into the combined sewer system.

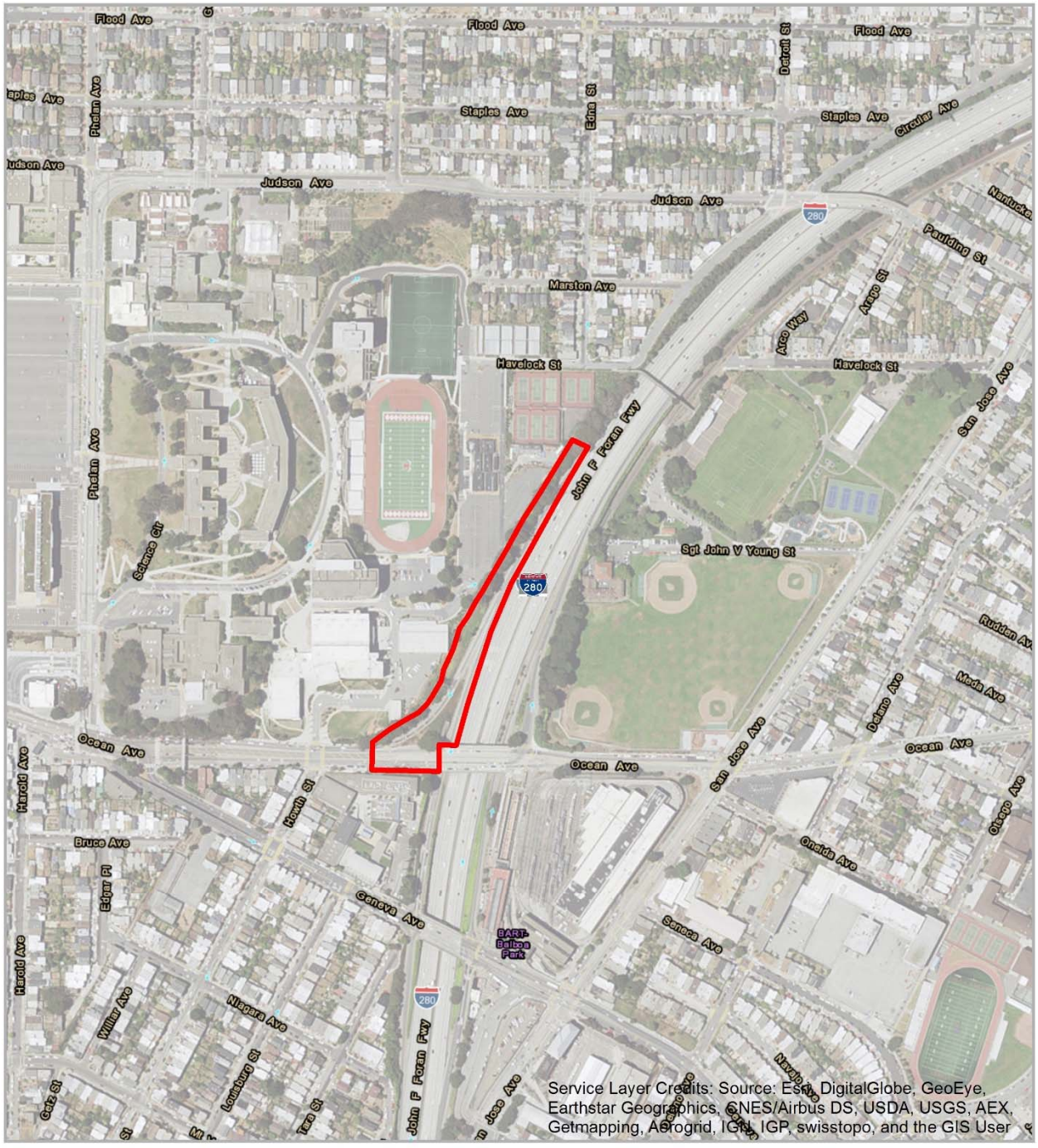
Required Attachments

- Vicinity Map
- Evaluation Documentation Form (EDF)
- Risk Level Determination Documentation

Supplemental Attachments

Note: Supplemental Attachments are to be supplied during the SWDR approval process when requested; where noted, some of these items may only be requested on a project-specific basis.

- BMP Cost Summary
- Checklist SW-1, Site Data Sources
- Checklist SW-2, Stormwater Quality Issues Summary
- Checklist SW-3, Measures for Avoiding or Reducing Potential Stormwater Impacts
- Checklist DPP-1, Parts 1–5 (Design Pollution Prevention BMPs)
- Construction Site BMP Consideration Form
- Checklist CS-1, Parts 1–6 (Construction Site BMPs)



Project Vicinity

Interstate 280 Interchange Modifications at Balboa Park Project

City of San Francisco, San Francisco County, California

Project Location

0 500 1,000 Feet

N

DATE: October 2017

Project ID (EA): 04-0K820

No.	Criteria	Yes ✓	No ✓	Supplemental Information for Evaluation
1.	Begin Project evaluation regarding requirement for implementation of Treatment BMPs	✓		See Figure 4-1, Project Evaluation Process for Consideration of Treatment BMPs. Continue to 2.
2.	Is the scope of the Project to install Treatment BMPs (e.g., Alternative Compliance or TMDL Compliance Units)?		✓	If **Yes**, go to 8. If **No**, continue to 3.
3.	Is there a direct or indirect discharge to surface waters?		✓	If **Yes**, continue to 4. If **No**, go to 9.
4.	As defined in the WQAR or ED, does the project: a. discharge to areas of Special Biological Significance (ASBS), or b. discharge to a TMDL watershed where Caltrans is named stakeholder, or c. have other pollution control requirements for surface waters within the project limits?			If **Yes to any**, contact the District/Regional Design Stormwater Coordinator or District/Regional NPDES Coordinator to discuss the Department's obligations, go to 8 or 5. _____*(Dist./Reg. Coordinator initials)* If **No** to all, continue to 5.
5.	Are any existing Treatment BMPs partially or completely removed? (ATA condition #1, Section 4.4.1)			If **Yes**, go to 8 **AND** continue to 6. If **No**, continue to 6.
6.	Is this a Routine Maintenance Project?			If **Yes**, go to 9. If **No**, continue to 7.
7.	Does the project result in an increase of one acre or more of new impervious surface (NIS)?			If **Yes**, go to 8. If **No**, go to 9.
8.	Project is required to implement Treatment BMPs.	Complete Checklist T-1, Part 1.		
9.	Project is not required to implement Treatment BMPs. _____*(Dist./Reg. Design SW Coord. Initials)* AU *(Project Engineer Initials)* 10/3/17 *(Date)*	Document for Project Files by completing this form and attaching it to the SWDR.		

Appendix D

VISUAL IMPACT ASSESSMENT

I-280 Southbound Ocean Avenue Off-Ramp Realignment Project

EA No. 04-0K820

PURPOSE OF STUDY AND ASSESSMENT METHOD

The purpose of this visual impact assessment (VIA) is to document potential visual impacts caused by the proposed project and propose measures to lessen any detrimental impacts that are identified. Visual impacts are demonstrated by identifying visual resources in the project area, measuring the amount of change that would occur as a result of the project, and predicting how the affected public would respond to or perceive those changes. This visual impact assessment follows the guidance outlined in the publication *Visual Impact Assessment for Highway Projects* published by the Federal Highway Administration (FHWA) in March 1981.

PROJECT DESCRIPTION

The project proposes to modify the existing southbound Interstate 280 (I-280) off-ramp at Ocean Avenue. The modifications include the following components:

- Elimination of the existing free-right turn lane for vehicles exiting the southbound I-280 off-ramp just prior to the Ocean Avenue/Howth Street intersection.
- Realignment and widening of the existing Ocean Avenue off-ramp to a two-lane T-intersection at Ocean Avenue, which will require the construction of a 700 foot long retaining wall up to 20 feet tall.
- Installation of a traffic signal at the realigned southbound I-280 off-ramp/Ocean Avenue intersection to provide controlled crossing for pedestrians and bicyclists.

The project will also include landscape replacement and will include texture and/or decorative treatments to the proposed retaining wall.

PROJECT LOCATION AND SETTING

The project location and setting provides for the context for determining the type of changes to the existing visual environment. The proposed project is located along the southbound off-ramp for I-280 at Ocean Avenue in the Balboa Park neighborhood of the City and County of San Francisco, California. The landscape is characterized by the line of the highway following the topography, with vegetation screening the adjacent development while offering views to the surrounding topography. The project site runs along a sloped road cut with sparse ground cover and mature cypress trees at the perimeter. The land use within the project corridor is primarily educational and residential, but includes recreational open space and a transit hub as well. The project site is located between the Balboa Park BART station and the City College of San Francisco (CCSF) and thousands of students walk through the project corridor daily. The project area primarily borders the CCSF campus. The project corridor is defined as the area of land that is visible from, adjacent to, and outside the highway right-of-way, and is determined by topography, vegetation, and viewing distance.

A Scenic Resource Evaluation of the project corridor has not been conducted but there are mature cypress trees within the project corridor. The project corridor is not a designated State Scenic Highway.

VISUAL RESOURCES AND RESOURCE CHANGE

Visual resources of the project setting are defined and identified below by assessing *visual character* and *visual quality* in the project corridor. *Resource change* is assessed by evaluating the visual character and the visual quality of the visual resources that comprise the project corridor before and after the construction of the proposed project.

The visual character of the proposed project will be compatible with the existing visual character of the corridor. The addition of the proposed retaining wall will be consistent with the overall visual character of I280 which traverses significant topographic features and regularly features retaining walls of a similar length, height, and character as is proposed.

Sloped area of the existing off ramp (shown on left) that would be replaced by an extra travel lane and retaining wall. A typical retaining wall along the I280 corridor is shown at right.

The visual quality of the project site will be altered by the proposed project. Currently the project site is characterized by vegetated roadside slopes that transitions to a shallower slope as the ramp terminates at Ocean Avenue. The proposed retaining wall would cut into the slope to accommodate an additional travel lane in the off-ramp. The existing sloped areas of the project corridor suffer erosion and vegetation loss and the proposed retaining wall would help manage these issues while maintaining the vegetated slope above the wall. At the intersection of the proposed off ramp and Ocean Avenue a group of cypress trees will be removed to realign the ramp, provide sufficient sight-distance for vehicle and pedestrian traffic, and to correct root intrusion problems caused by the cypress that is heaving the sidewalk.

Resource Change will be moderate-low. The proposed project will transform the west edge of the site from a vegetated slope to an engineered wall, and remove the trees that provide a visual screen between Ocean Avenue and the I-280 off-ramp. The cypress trees cannot be safely replaced at the same

location, but replacement planting would occur within the project area to the extent feasible, in accordance with Caltrans' Replacement Highway Planting Policy.

The cypress trees that will be removed by the proposed intersection improvements. Note the heaving of the sidewalk that is occurring.

VIEWERS AND VIEWER RESPONSE

Neighbors (people with views *to* the road) and *highway users* (people with views *from* the road) will be affected by the proposed project. Highway users have moderate exposure and highway neighbors have high exposure to the project site. Most of the visual change would occur along the highway offramp, where viewer sensitivity is anticipated to be low. Viewer sensitivity to visual change along Ocean Avenue is anticipated to be moderate. Overall viewer response is anticipated to be moderate-low, with the tree removal along Ocean Avenue expected to generate the most response.

VISUAL IMPACT

Visual impacts are determined by assessing changes to the visual resources and predicting viewer response to those changes. A no-build alternative would continue to have issues of erosion and vegetation loss along the offramp and sidewalk heaving caused by cypress root intrusion would worsen along Ocean Avenue. The proposed build alternative would cause moderate-low change to visual resources and is anticipated to have a moderate-low viewer response. Thus, the project would have an overall

moderate-low visual impact. The visual character would be more engineered, but would remain vegetated. Scenic vistas and light and glare will not be altered.

AVOIDANCE AND MINIMIZATION MEASURES

Avoidance or minimization measures have been identified and can lessen visual impacts caused by the project. Also, the inclusion of aesthetic features in the project design previously discussed can help generate public acceptance of a project. This section describes additional avoidance and/or minimization measures to address specific visual impacts.

1. Tree and vegetation removal would be minimized to the extent feasible.
2. Trees and vegetation outside of clearing and grubbing limits shall be protected from the contractor's operations, equipment, and materials storage.
3. Replacement Highway Planting will be provided in all areas of highway planting removal where Right of Way allows. Where replacement planting is not possible at the removal location, replacement will be provided in adjacent planting areas along the project corridor.
4. Decorative treatments of texture and pattern will be added to the retaining wall to reduce the overall visual impact of the wall, and possibly images or other culturally significant features can be added to the wall surface.