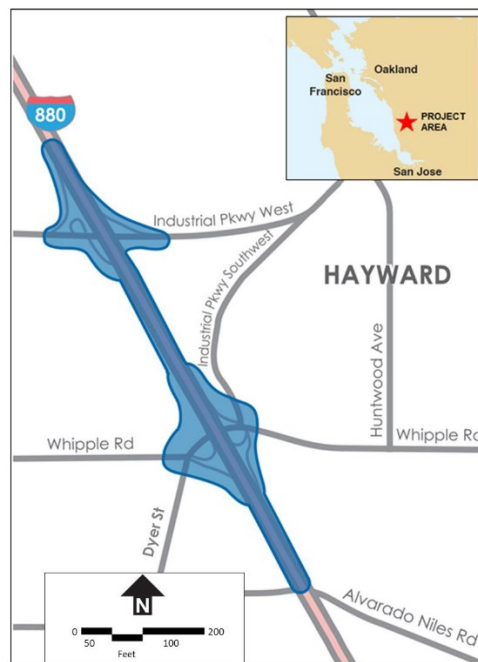


I-880 INTERCHANGE IMPROVEMENTS PROJECT – Whipple Road-Industrial Parkway Southwest and Industrial Parkway West

ALAMEDA COUNTY, CALIFORNIA
DISTRICT 4 – ALA – 880 (PM 13.04/14.75)
EA 04-0Q280 / Project ID 0418000067

Initial Study with Proposed Negative Declaration and Environmental Assessment



Prepared by the California Department of Transportation



January 2021

The environmental review, consultation, and any other actions required by applicable federal environmental laws for this project are being, or have been, carried out by Caltrans pursuant to 23 USC 327 and the Memorandum of Understanding date December 23, 2016 and executed by FHWA and Caltrans.

GENERAL INFORMATION ABOUT THIS DOCUMENT

WHAT'S IN THIS DOCUMENT:

The California Department of Transportation (Caltrans), as assigned by the Federal Highway Administration (FHWA), in cooperation with the Alameda County Transportation Commission (Alameda CTC) and the City of Hayward (Hayward) and Union City, has prepared this Initial Study with proposed Negative Declaration (ND) and Environmental Assessment (IS/EA). This IS/EA examines the potential environmental impacts of alternatives being considered for the project, which is in Alameda County, California. Caltrans is the lead agency for preparing the environmental document in compliance with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). This document tells you why the project is being proposed, alternatives considered, how the existing environment could be affected, the potential impacts of each of the alternatives, and the proposed avoidance and/or minimization measures.

WHAT YOU SHOULD DO:

Please read this document.

Copies of this document and the related technical studies are available online:

- Caltrans District 4 website at: <https://dot.ca.gov/caltrans-near-me/district-4/d4-popular-links/d4-environmental-docs>
- Alameda CTC project website at: <https://www.alamedactc.org/programs-projects/>

Email the project team with comments via email to Charles.Winter@dot.ca.gov (**preferred during COVID-19**)

Send comments via postal mail to:

Caltrans District 4
Office of Environmental Analysis
ATTN: Charles Winter
P.O. Box 23660, MS-8B
Oakland, CA 94623-0660

Be sure to send comments by the deadline: March 5, 2021

WHAT HAPPENS NEXT:

After comments are received from the public and reviewing agencies, Caltrans, as assigned by the FHWA, may: (1) give environmental approval to the proposed project, (2) do additional environmental studies, or (3) abandon the project. If the project is given environmental approval and funding is obtained, Caltrans could design and construct all or part of the project.

For individuals with sensory disabilities, this document can be made available in Braille, in large print, on audiocassette, or on computer disk. To obtain a copy in one of these alternate formats, please call or write to Caltrans, Attn: Charles Winter, (510)-286-5594, or use the California Relay Service TTY number, 711.

DISTRICT 4 – ALA – 880 PM 13.04/14.75
04-0Q280 / 04-1800-0067

Interchange improvements along Interstate (I)-880, from south of the I-880/Whipple Road-Industrial Parkway Southwest Interchange to north of the I-880/Industrial Parkway West Interchange in Union City, in Alameda County

**Initial Study with Proposed
Negative Declaration and Environmental Assessment**

Submitted Pursuant to: (State) Division 13, California Public Resources Code
(Federal) 42 USC 4332(2)(C)

THE STATE OF CALIFORNIA
Department of Transportation

Cooperating Agencies: U.S. Army Corps of Engineers

Responsible Agencies: Alameda County Flood Control District, Alameda County Transportation Commission, California Department of Fish and Wildlife, California Transportation Commission, Regional Water Quality Control Board, State Historic Preservation Officer



12/1/2020

Dina El-Tawansy
Acting District Director
Caltrans District 4
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Proposed Negative Declaration
Pursuant to: Division 13, Public Resources Code

Project Description

Caltrans, as assigned by FHWA, in cooperation with Alameda CTC, and in partnership with the cities of Hayward and Union City, proposes to provide interchange and local roadway improvements along Interstate 880 (I-880) from 0.6 mile south of the I-880/Whipple Road-Industrial Parkway Southwest Interchange to 0.3 mile north of the I-880/Industrial Parkway West Interchange. The I-880 Interchange Improvements Project (project) would include interchange on- and off-ramp reconfigurations, modifications and/or replacement of bridge structures, local roadway realignments and restriping, and bicycle and pedestrian improvements in the cities of Hayward and Union City.

Determination

This proposed ND is included to give notice to interested agencies and the public that it is Caltrans's intent to adopt an ND for this project. This does not mean that Caltrans' decision regarding the project is final. This ND is subject to change based on comments received by interested agencies and the public.

Caltrans has prepared an Initial Study for this project, and pending public review, expects to determine from this study that the proposed project would not have a significant effect on the environment for the following reasons:

- The proposed project would have no effect on agriculture and forest resources, land use, mineral resources, population and housing, recreation, and wildfire.
- The proposed project would have less than significant effects on aesthetics, air quality, biological resources, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, noise, public services, traffic and transportation, tribal cultural resources, and utilities and system services.

Dina El-Tawansy
Acting District Director
Caltrans District 4
CEQA/NEPA Lead Agency

Date

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SUMMARY

Caltrans, as assigned by FHWA, in cooperation with Alameda CTC, Hayward, and Union City, propose to provide interchange and local road improvements along I-880 from 0.6 mile south of the I-880/Whipple Road-Industrial Parkway Southwest Interchange to 0.3 mile north of the I-880/Industrial Parkway West Interchange. Caltrans is the lead agency for this project under CEQA and NEPA.

California participated in the “Surface Transportation Project Delivery Pilot Program” (Pilot Program) pursuant to 23 USC 327, for more than five years, beginning July 1, 2007, and ending September 30, 2012. MAP-21 (P.L. 112-141), signed by President Obama on July 6, 2012, amended 23 USC 327 to establish a permanent Surface Transportation Project Delivery Program. As a result, the Department entered into a Memorandum of Understanding pursuant to 23 USC 327 (NEPA Assignment MOU) with FHWA. The NEPA Assignment MOU became effective October 1, 2012 and was renewed on December 23, 2016 for a term of five years. In summary, the Department continues to assume FHWA responsibilities under NEPA and other federal environmental laws in the same manner assigned under the Pilot Program, with minor changes. With NEPA Assignment, FHWA assigned and the Department assumed all of the United States Department of Transportation (USDOT) Secretary's responsibilities under NEPA. This assignment includes projects on the State Highway System and Local Assistance Projects off of the State Highway System within the State of California, except for certain categorical exclusions that FHWA assigned to the Department under the 23 USC 326 CE Assignment MOU, projects excluded by definition, and specific project exclusions.

The purpose of the project is to improve traffic operations and safety at the I-880/Whipple Road-Industrial Parkway Southwest and I-880/Industrial Parkway West interchanges and to improve bicycle and pedestrian access through the I-880/Whipple Road-Industrial Parkway Southwest and I-880/Industrial Parkway West interchanges.

The I-880/Whipple Road-Industrial Parkway Southwest interchange currently operates at or over capacity. The following are several key existing traffic operational issues identified at the I-880/Whipple Road-Industrial Parkway Southwest ramp terminal intersections:

- Field observations indicate queues for the northbound off-ramp occasionally extend onto the freeway mainline.

- There is currently more travel demand than available capacity for the northbound off-ramp approach. Traffic operation models indicate the northbound off-ramp approach operates at a volume-to-capacity ratio of 1.10 during the peak morning (AM) and 1.29 during the peak evening (PM) commuter period.
- According to the California Department of Finance, a 17 percent increase in population is predicted within Hayward by 2035 compared to 2015 population numbers.
- Travel demand model forecasts from Hayward's General Plan Update shows an expected growth at the ramp terminal intersections of approximately 30 percent during the morning (AM) and 12 percent during the evening (PM) peak hour by 2035 compared to 2015.

As traffic volumes grow and capacity remains constrained at the I-880/Whipple Road-Industrial Parkway Southwest interchange, regional traffic is forecast to divert to the surrounding local street network, such as Alvarado-Niles Road, Industrial Parkway and Union City Boulevard to avoid congestion. Diversion of regional traffic onto the local street network may result in:

- Increased delay experienced by local commuters
- Potential economic loss for local businesses, trucking, and delivery companies as a result of increased recurring congestion
- Reduced air quality as a result of increased vehicle miles travelled

Network improvements at the I-880/Industrial Parkway West Interchange could alleviate travel demand at the I-880/Whipple Road-Industrial Parkway Southwest Interchange and alleviate traffic related impacts to the local street network.

Three design alternatives were developed to meet the project purpose and need, while avoiding or minimizing environmental impacts. The alternatives are "Build Alternative 1", "Build Alternative 2", "Build Alternative 3", and the "No-Build Alternative". Differences between Build Alternatives 1, 2, and 3 are related to the proposed southbound on-ramp and off-ramp configurations at the I-880/Industrial Parkway West interchange.

Under the No-Build Alternative, none of the improvements proposed under the project would occur. Other planned and approved land use development and transportation improvements along local routes may be implemented by local agencies or under other projects. The No-Build Alternative is considered the environmental baseline against which potential environmental effects of the Build Alternatives are evaluated.

Table S-1 summarizes the NEPA impacts of the Build Alternatives and the No-Build Alternative. A summary of the proposed avoidance and minimization measures to reduce the effects of the Build Alternatives is also presented. Where appropriate, the environmental consequences and avoidance and minimization measures specific to Build Alternative 1, 2, and 3 are identified. For a complete description of potential adverse effects and recommended measures, please refer to the specific sections within Chapter 2.0, Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures. For a description of environmental impacts under CEQA, please refer to Chapter 3.0.

Table S-1 Summary of Environmental Impacts

Affected Resource (Section)	Potential Impact				Avoidance and Minimization Measures
	No-Build Alternative	Build Alternative 1	Build Alternative 2	Build Alternative 3	
Land Use (2.1.1)	None	No Adverse Impact.	No Adverse Impact. Same as Build Alternative 1.	No Adverse Impact. Same as Build Alternative 1.	None
Parks and Recreation Facilities (2.1.2)	None	No Adverse Impact.	No Adverse Impact. Same as Build Alternative 1.	No Adverse Impact. Same as Build Alternative 1.	None
Community Impacts, including Community Character and Cohesion Relocations and Real Property Acquisitions (2.1.3)	None	No Adverse Impact. One potential relocation; permanent acquisitions from 23 parcels.	No Adverse Impact. Permanent acquisitions from 25 parcels.	No Adverse Impact. Permanent acquisitions from 22 parcels.	Measure COM-1: Alameda CTC and Caltrans would work closely with any displaced businesses, per federal and state relocation laws and policies.

Affected Resource (Section)	Potential Impact				Avoidance and Minimization Measures
	No-Build Alternative	Build Alternative 1	Build Alternative 2	Build Alternative 3	
Environmental Justice (2.1.3)	None	No Adverse Impact.	No Adverse Impact. Same as Build Alternative 1.	No Adverse Impact. Same as Build Alternative 1.	None
Utilities/ Emergency Services (2.1.4)	None	No Adverse Impact.	No Adverse Impact. Same as Build Alternative 1.	No Adverse Impact. Same as Build Alternative 1.	Measure UTL-1: Detailed utility coordination and verification will be required during the design phase of the project. Measure-UTL-2: Emergency Services will be notified prior to construction of any temporary road closures and/or detours as part of the Transportation Management Plan (TMP).
Traffic and Transportation /Pedestrian and Bicycle Facilities (2.1.5)	None	No Adverse Impact.	No Adverse Impact. Same as Build Alternative 1.	No Adverse Impact. Same as Build Alternative 1.	TRA-1: A TMP will be prepared to ensure efficient movement of local and regional traffic during construction.

Affected Resource (Section)	Potential Impact				Avoidance and Minimization Measures
	No-Build Alternative	Build Alternative 1	Build Alternative 2	Build Alternative 3	
Visual/Aesthetics (2.1.6)	None	No Adverse Impact.	No Adverse Impact. The overall visual impact under Build Alternative 2 would be moderate.	No Adverse Impact. The overall visual impact under Build Alternative 3 would be moderate-low.	Measure VIS-1: Existing landscaping and other roadside vegetation removed by the Build Alternatives would be replaced where proper setback exists and where feasible per Caltrans policy. Measure VIS-3: To reduce the visual impact of new retaining walls and bridge structures, aesthetic treatments consisting of color, texture and/or patterning will be applied to reduce visual impacts.
Cultural Resources and Tribal Cultural Resources (2.1.7)	None	No Adverse Impact.	No Adverse Impact. Same as Build Alternative 1.	No Adverse Impact. Same as Build Alternative 1.	Caltrans Standard Practice CUL-1: If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area would be diverted until a qualified archaeologist can assess the nature and significance of the find. Caltrans Standard Practice CUL-2: If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall cease in any area or nearby area suspected to overlie remains, and the County Coroner contacted

Affected Resource (Section)	Potential Impact				Avoidance and Minimization Measures
	No-Build Alternative	Build Alternative 1	Build Alternative 2	Build Alternative 3	
Hydrology and Floodplain (2.2.1)	None	No Adverse Impact.	No Adverse Impact. Same as Build Alternative 1.	No Adverse Impact. Same as Build Alternative 1.	Measure HYDRO-1: Further Hydraulic Analysis. To determine the extent of localized overtopping of the eastern levee along Ward Creek, more refined modeling using the project grading plan is required.
Water Quality and Storm Water Runoff (2.2.2)	None	No Adverse Impact.	No Adverse Impact. Same as Build Alternative 1.	No Adverse Impact. Same as Build Alternative 1.	Measure WQ-1: Temporary Construction BMPs. Pursuant to the Construction General Permit, a SWPPP would be developed for the project and would comply with the Caltrans SWMP. Measure WQ-2: Design Pollution Prevention BMPs. Pollution Prevention BMPs, would be employed to minimize hydromodification impacts Measure WQ-3: Conduct work according to the 2018 Caltrans Standard Specifications. Quality Control specifications outlined in Section 13 of the Caltrans Standard Specifications would be employed to ensure that water quality at the project site and receiving waters would not be polluted by construction activities.

Affected Resource (Section)	Potential Impact				Avoidance and Minimization Measures
	No-Build Alternative	Build Alternative 1	Build Alternative 2	Build Alternative 3	
					Measure WQ-4: Treatment BMPs. Post-construction treatment BMPs, in compliance with the Caltrans SWMP, shall be implemented to ensure the project does not increase stormwater volumes in the existing stormwater conveyance channels, thereby avoiding secondary effects such as erosion and downstream impacts to water quality.

Affected Resource (Section)	Potential Impact				Avoidance and Minimization Measures
	No-Build Alternative	Build Alternative 1	Build Alternative 2	Build Alternative 3	
Geology/ Soils/ Seismic/ Topography (2.2.3)	None	No Adverse Impact.	No Adverse Impact. Same as Build Alternative 1.	No Adverse Impact. Same as Build Alternative 1.	<p>Measure GEO-1: With respect to worker safety during construction, the Occupational Safety and Health Administration (OSHA) requires employers to comply with hazard-specific safety and health standards.</p> <p>Measure GEO-2: Expansive soils shall be addressed through treatment or removal, in order to reduce the potential for structural damage.</p> <p>Measure GEO-3: As part of the final design phase, Caltrans requires preparation of structure foundation reports and geotechnical design reports that incorporate the results of subsurface field work and laboratory testing</p>
Paleontology (2.2.4)	None	No Adverse Impact	No Adverse Impact. Same as Build Alternative 1.	No Adverse Impact. Same as Build Alternative 1.	Measure PAL-1: Paleontological Mitigation Plan. Prior to construction, a Paleontological Mitigation Plan (PMP) shall be drafted and will include provisions for periodic spot checks to check for the presence of Pleistocene deposits during deeper excavations.

Affected Resource (Section)	Potential Impact				Avoidance and Minimization Measures
	No-Build Alternative	Build Alternative 1	Build Alternative 2	Build Alternative 3	
Hazardous Waste/ Materials (2.2.5)	None	No Adverse Impact	No Adverse Impact. Same as Build Alternative 1.	No Adverse Impact. Same as Build Alternative 1.	<p>Measure HAZ-1: During the final design phase, a Preliminary Site Investigation (PSI) of the project site shall be performed to investigate hazardous materials concerns related to soil, groundwater, and construction materials identified in the Phase 1 Initial Site Assessment (ISA).</p> <p>Measure HAZ-2: At a minimum, groundwater from dewatering of excavations, if any, would be stored in Baker tank(s) during construction activities and the water would be characterized prior to disposal or recycling. Similarly, excavated soil would be stockpiled for waste characterization and testing.</p> <p>Measure HAZ-3: In accordance with Caltrans protocol, a Site Safety Plan shall be prepared and implemented prior to initiation of any construction/development activities to reduce health and safety hazards to workers and the public</p> <p>Measure HAZ-4: Hazardous building materials surveys shall be</p>

Affected Resource (Section)	Potential Impact				Avoidance and Minimization Measures
	No-Build Alternative	Build Alternative 1	Build Alternative 2	Build Alternative 3	
					<p>conducted by a qualified professional</p> <p>Measure HAZ-5: Yellow thermoplastic and yellow paint striping and markings on existing roadways shall be analyzed for lead chromate prior to disturbance or removal in accordance with Chapter 7 of Caltrans' Construction Manual.</p> <p>Measure HAZ-6: Asphalt-concrete and Portland-cement concrete grindings shall be reused in accordance with San Francisco Bay RWQCB guidelines for Caltrans' projects or transported offsite for recycling or disposal.</p>

Affected Resource (Section)	Potential Impact				Avoidance and Minimization Measures
	No-Build Alternative	Build Alternative 1	Build Alternative 2	Build Alternative 3	
Air Quality (2.2.6)	None	No Adverse Impact.	No Adverse Impact. Same as Build Alternative 1.	No Adverse Impact. Same as Build Alternative 1.	Measure AQ 1: Avoidance and minimization control measures will be implemented as specified in Standard Specifications Section 14-9.02 "Air Pollution Control", Section 18-1.03 "Dust Palliatives; Construction", and other sections related to dust control. Dust control measures will be considered during development of Plans, Specifications, and Estimates (PS&E) for the project construction contract.
Noise (2.2.7)	None	No Adverse Impact.	No Adverse Impact. Same as Build Alternative 1.	No Adverse Impact. Same as Build Alternative 1.	Measure NOISE-1: Standard Caltrans noise control measures are used for all projects and require that construction noise shall not exceed a maximum sound level of 86 A-weighted decibels at 50 feet between the hours of 9:00 p.m. and 6:00 a.m.
Natural Communities (2.3.1)	None	No Adverse Impact.	No Adverse Impact.	No Adverse Impact.	Measure BIO-1: The contractor will avoid the removal of trees regulated by local jurisdiction (i.e., Hayward and Union City) by minimizing the area of disturbance where practicable.

Affected Resource (Section)	Potential Impact				Avoidance and Minimization Measures
	No-Build Alternative	Build Alternative 1	Build Alternative 2	Build Alternative 3	
Wetlands and other Waters (2.3.2)	None	No Adverse Impact.	No Adverse Impact. Same as Build Alternative 1.	No Adverse Impact. Same as Build Alternative 1.	Measure BIO-2: Prior to conducting work within the unnamed tributary to Ward Creek, Ward Creek, the Zone 3A Line D Channel, stormwater infrastructure, or stormwater basins, the contractor will implement clear-water diversions (e.g., coffer dams and piping water through the work area) spanning in-water work areas to avoid downstream water quality impacts and potential impacts. Measure BIO-3: Compensatory mitigation will be required for impacts to aquatic resources that would result from Ward Creek realignment.
Plant Species (2.3.3)	None	No Adverse Impact	No Adverse Impact. Same as Build Alternative 1.	No Adverse Impact. Same as Build Alternative 1.	None
Animal Species (2.3.4)	None	No Adverse Impact. Creek and	No Adverse Impact. Same as Build Alternative 1.	No Adverse Impact. Same as Build Alternative 1.	Measure BIO-2: Prior to conducting work within the unnamed tributary to Ward Creek, Ward Creek, the Zone 3A Line D Channel, stormwater infrastructure, or stormwater basins, the contractor will implement clear-water diversions (e.g., coffer dams and piping water through the work

Affected Resource (Section)	Potential Impact				Avoidance and Minimization Measures
	No-Build Alternative	Build Alternative 1	Build Alternative 2	Build Alternative 3	
					<p>area) spanning planned in-water work areas to avoid downstream water quality impacts.</p> <p>Measure BIO-4: Because tree removal, clearing and grubbing, and other activities are necessary for implementation of the project, the contractor will remove trees, inactive nests, and other nesting substrate (e.g., trees, shrubs, structures, emergent vegetation) and install nest exclusion measures (e.g., non-mono-filament netting, bird spikes, plastic sheeting, mesh, and fill cavities) during the non-nesting season (October 1 to January 31) within the project footprint to the extent possible.</p> <p>Measure BIO-5: The contractor will install wildlife exclusion fencing (i.e., silt fence) along the banks of stream segments and basins within 100 feet of the proposed Ward Creek realignment segment and stormwater basin margin reconfiguration areas to prevent movement of the western pond turtle into the work area.</p>

Affected Resource (Section)	Potential Impact				Avoidance and Minimization Measures
	No-Build Alternative	Build Alternative 1	Build Alternative 2	Build Alternative 3	
Threatened and Endangered Species (2.3.5)	None	No Impact.	No Impact. Same as Build Alternative 1.	No Impact. Same as Build Alternative 1.	None
Invasive Species (2.3.6)	None	No Adverse Impact.	No Adverse Impact. Same as Build Alternative 1.	No Adverse Impact. Same as Build Alternative 1.	BIO-6: The contractor will implement practices to minimize the potential to introduce or spread invasive plant species.

Table S-2 identifies the permits and approvals that would be required for project construction.

Table S-2 Permits and Approvals Needed

Agency	Permit/Approval	Status
United States Army Corps of Engineers	Section 404, Clean Water Act, Permit – Individual	Issued during the final design phase
California Department of Fish and Wildlife	1602 Agreement for Streambed Alteration	Issued during the final design phase
Regional Water Quality Control Board	Section 401, Clean Water Act, Certification	Issued during the final design phase
State Historic Preservation Officer	Concurrence on Eligibility Determinations	Issued prior to project approval; request for concurrence submitted to SHPO on March 23, 2020. Concurrence was received on April 14, 2020.
Metropolitan Transportation Commission Air Quality Conformity Task Force/Federal Highway Administration	Regional Air Quality Conformity	Issued prior to project approval

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- Appendix C Updated Species Lists for USFWS, NMFS, CNPS, and CNDDB
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LIST OF ACRONYMS

AB 32	Assembly Bill 32
AB 1493	Assembly Bill 1493
ABAG	Association of Bay Area Governments
ACS	American Community Survey
ADA	Americans with Disabilities Act
ADL	aerially deposited lead
ADT	average daily trips
AIA	airport's area of influence
AM	morning hours
APCD	Air Pollution Control District
APE	area of potential effect
APN	assessor parcel number
ARB	California Air Resources Board
ARS	acceleration response spectrum
ASR	Archaeological Survey Report
ASTM	American Society of Testing and Materials
ATT	average travel time
ATS	average travel speed
BAAQMD	Bay Area Air Quality Management District
BART	Bay Area Rapid Transit
BCDC	San Francisco Bay Conservation and Development Commission
BFE	Base Flood Elevations
BMPs	Best Management Practices
BTEX	total xylenes
BTH	Business, Transportation and Housing
BSA	biological study area
CAAQS	California Ambient Air Quality Standards

EPA	Environmental Protection Agency
CAL FIRE	California Department of Forestry and Fire Protection
Caltrans	California Department of Transportation
CAFE	Corporate Average Fuel Economy
CAPM	Capital Preventative Maintenance
CARB	California Air Resources Board
CBD	Central Business District
CCCFPD	Contra Costa County Fire Protection District
CCR	California Code of Regulations
CCTA	Contra Costa Transportation Authority
CDFW	California Department of Fish and Wildlife
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Compensation and Liability Act of 1980
CERFA	Community Environmental Response Facilitation Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CH ₄	methane
CIA	Community Impact Assessment
CIP	Capital Improvement Plan
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CNWS	Concord Naval Weapons Station
CRHR	California Registry of Historical Resources
CRLF	California red-legged frog
CRMP	Construction Risk Management Plan
CWA	Clean Water Act
CO	carbon monoxide
CO ₂	carbon dioxide
CO-CAT	Costal Ocean Climate Action Team
CTP	Comprehensive Transportation Plan
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibel
DBH	diameter at breast height
DOGGR	The Division of Oil, Gas, and Geothermal Resources
DOT	Department of Transportation
DSA	Disturbed Soil Area

DSI	Detailed Site Investigation
EA	Environmental Assessment
EBMUD	East Bay Municipal Utility District
EIS	Environmental Impact Statement
EO	Executive Order
ESA	environmentally sensitive area
ESL	Environmental Screening Limits
FCAA	Federal Clean Air Act
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FIRM	Flood Insurance Rate Maps
FMMP	Farmland Mapping and Monitoring Program
FONSI	Finding of No Significant Impact
FSTIP	Federal Statewide Transportation Improvement Program
FTA	Federal Transit Administration
FTIP	Federal Transportation Improvement Program
GHGs	greenhouse gases
H ₂ S	Hydrogen Sulfide
HFC-134a	s, s, s, 2 -tetrafluoroethane
HFC-152a	difluoroethane
HFC-23	fluoroform
HOV	high occupancy vehicle
HPSR	Historic Property Survey Report
HRER	Historic Resources Evaluation Report
IGR	Intergovernmental Review
IPCC	Intergovernmental Panel on Climate Change
IS	Initial Study
ISA	Initial site assessment
ITI	Industrial Technology and Innovation
ITS	Intelligent Transportation System
L _{eq}	The average A-weighted noise level during the measurement period
L _{max}	The maximum A-weighted noise level during the measurement period
LCFS	Low Carbon Fuel Standard
LEDPA	least environmentally damaging practicable alternative
LOS	Levels of Service
LT	long-term

MBTA	Migratory Bird Treaty Act
MLD	Most Likely Descendent
MMI	Modified Mercalli Intensity Scale
MMTCO _{2e}	million metric tons of carbon dioxide equivalent
MOE	measure of effectiveness
MPO	Metropolitan Planning Organization
MRP	Municipal Regional Permit
MRZ	Mineral resource zone
MS4s	Municipal Separate Storm Sewer Systems
MSAT	Mobile Source Air Toxics
MSL	mean sea level
MTBE	methyl tert-butyl ether
MTC	Metropolitan Transportation Commission
N ₂ O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAC	noise abatement criteria
NADR	Noise Abatement Decision Report
NAHC	Native American Historic Commission
ND	Negative Declaration
NEPA	National Environmental Policy Act
NES	Natural Environment Study
NHPA	National Historic Preservation Act
NHTSA	National Highway Traffic Safety Administration
NO _x	nitrogen oxides
NO ₂	nitrogen dioxide
NOA	Notice of Availability
NOAA	National Oceanic Atmospheric Administration
NOAA Fisheries	National Marine Fisheries Service (NMFS)
NOD	Notice of Determination
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
O ₃	ozone
OCPs	organochlorine pesticides
OHWM	ordinary high water mark
OPR	Office of Planning and Research
OSHA	Occupational Safety and Health Act

OSTP	Office of Science and Technology Policy
PA	Programmatic Agreement
PA/ED	project approval/environmental document
PAH	polynuclear aromatic compounds
Pb	lead
PDA	priority development area
PDT	project development team
PGA	peak ground acceleration
PG&E	Pacific Gas & Electric
PID	Project Initiation Document
PM	particulate matter
PM	evening hours
PPM	parts per million
POAQC	projects of air quality concern
PQS	Professionally Qualified Staff
PRC	Public Resources Code
PSI	Preliminary Site Investigation
PSR	project study report
RAP	Relocation Assistance Program
Resources Agency	California Natural Resources Agency
ROG	reactive organic gases
ROW	right-of-way
RTP	Regional Transportation Plan
RTPA	Regional Transportation Planning Agency
RWQCB	Regional Water Quality Control Board
RCRA	Resource Conservation and Recovery Act of 1976
SCS	Sustainable Communities Strategy
SDC	Seismic Design Criteria
SF ₆	sulfur hexafluoride
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO ₂	sulfur dioxide
So _x	sulfur oxides
SPUI	Single Point Urban Interchange
SR	State Route
SR 242	State Route 242
ST	short-term
STLC	Solubility Threshold Concentration Limit

SVOCs	semi-volatile organic compounds
SWDR	Storm Water Data Report
SWMP	Storm Water Management Plan
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TCE	temporary construction easement
TIP	Transportation Improvement Plan
TMDL	Total Maximum Daily Loads
TMP	Traffic Management Plan
TNM	Traffic Noise Model
TOS	traffic operating system
TPH	total petroleum hydrocarbons
TSCA	Toxic Substances Control Act
U.S.	United States
USC	United States Code
U.S. EPA	United States Environmental Protection Agency
USACE	United States Army Corps of Engineers
USDOT	United States Department of Transportation
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VIA	Visual Impact Assessment
VMT	vehicle miles traveled
VPH	vehicles per hour
VOCs	volatile organic compounds
WDRs	Waste Discharge Requirements
WPCP	Water Pollution Control Plan

1.0 PROPOSED PROJECT

1.1 INTRODUCTION

Caltrans, as assigned by FHWA, in cooperation with Alameda CTC, Hayward, and Union City, proposes to provide interchange and local roadway improvements along Interstate 880 (I-880) from 0.6 mile south of the I-880/Whipple Road-Industrial Parkway Southwest Interchange to 0.3 mile north of the I-880/Industrial Parkway West Interchange. The I-880 Interchange Improvements Project (project) would include interchange on- and off-ramp reconfigurations, modifications and/or replacement of bridge structures, local roadway realignments and restriping, and bicycle and pedestrian improvements in the cities of Hayward and Union City.

1.1.1 STATE/REGIONAL/LOCAL PLANNING


MTC is the regional transportation planning agency in the San Francisco Bay Area that includes the project area. MTC is responsible for updating the Regional Transportation Plan (RTP), which is a comprehensive blueprint for the development of mass transit, highway, freight, bicycle and pedestrian facilities. MTC and the Association of Bay Area Governments (ABAG) program San Francisco Bay Area projects in the RTP *Plan Bay Area 2040*. The I-880/Industrial Parkway West Interchange improvement is included in the RTP under reference number ID 17-01-0023. The project is also included in the MTC 2019 Transportation Improvement Program (TIP) under reference numbers ID ALA110002 and ALA170005. The I-880/Whipple Road Interchange improvements are included in the RTP under reference numbers ID 17-01-0021 and 17-01-0023. MTC adopted the TIP on September 26, 2018. FHWA approved and incorporated the TIP into the Federal Statewide Transportation Improvement Program (FSTIP) on December 17, 2018.

Both the I-880/Whipple Road- Industrial Parkway Southwest and I-880/Industrial Parkway West interchanges are currently named projects in the *2014 Alameda CTC Measure BB Transportation Expenditure Plan* (TEP) and have been programmed for improvements using local funds.

I-880 Interchange Improvements (Whipple Road-Industrial Parkway Southwest and Industrial Parkway West) Project



Legend

 Project Area

Regional Location and Project Area

Figure

1.1-1

1.2 PURPOSE AND NEED

1.2.1 PURPOSE

The purpose of the project is to:

- Modernize and improve current and expected future traffic operations at the I-880/Whipple Road-Industrial Parkway Southwest and I-880/Industrial Parkway West interchanges by improving accessibility and enhancing mobility to the City of Hayward Industrial Technology and Innovation (ITI) Corridor.
- Complete the partial interchange at I-880/Industrial Parkway West to provide access to Industrial Parkway West for northbound I-880 traffic.
- Improve bicycle and pedestrian access through the I-880/Whipple Road-Industrial Parkway Southwest and I-880/Industrial Parkway West interchanges.

1.2.2 NEED

CAPACITY AND TRANSPORTATION DEMAND

The I-880/Whipple Road-Industrial Parkway Southwest interchange currently operates at or over capacity. The following are several key existing traffic operational issues identified at the I-880/Whipple Road-Industrial Parkway Southwest ramp terminal intersections:

- Field observations indicate queues for the northbound off-ramp occasionally extend onto the freeway mainline. This results in unsafe conditions for those stopped on I-880 and increases the risk of rear-end collisions.
- There is currently more travel demand than available capacity for the northbound off-ramp approach. Traffic operation models indicate the northbound off-ramp approach operates at a volume-to-capacity ratio of 1.10 during the peak morning (AM) and 1.29 during the peak evening (PM) commuter period.
- According to the California Department of Finance, a 17 percent increase in population is predicted within Hayward by 2035 compared to 2015 population numbers.
- Travel demand model forecasts from Hayward's General Plan Update shows an expected growth at the ramp terminal intersections of approximately 30 percent during the morning (AM) and 12 percent during the evening (PM) peak hour by 2035 compared to 2015.

As traffic volumes grow and capacity remains constrained at the I-880/Whipple Road-Industrial Parkway Southwest interchange, regional traffic is forecast to divert to the

surrounding local street network, such as Alvarado-Niles Road, Industrial Parkway and Union City Boulevard to avoid congestion. Diversion of regional traffic onto the local street network may result in the following quality of life impacts to the local community:

- Increased delay experienced by local commuters
- Potential economic loss for local businesses, trucking, and delivery companies as a result of increased recurring congestion
- Reduced air quality as a result of increased vehicle miles travelled

Network improvements at the I-880/Industrial Parkway West Interchange could alleviate travel demand at the I-880/Whipple Road-Industrial Parkway Southwest Interchange and alleviate traffic related impacts to the local street network.

Table 1.2-1 shows the expected degradation of overall intersection operations at the I-880/Whipple Road-Industrial Parkway Southwest ramp terminal intersections.

Table 1.2-1 Intersection Operations at I-880/Whipple Road-Industrial Parkway Southwest

Intersection	Peak Hour	2018		2045	
		Delay (s/veh)	LOS	Delay (s/veh)	LOS
I-880 at Whipple Road Northbound Ramp Terminal Intersection	AM	44.0	D	91.3	F
	PM	54.2	D	71.2	F
I-880 at Whipple Road Southbound Ramp Terminal Intersection	AM	60.4	E	85.1	F
	PM	48.1	D	90.8	F
I-880 at Industrial Parkway West and Southbound Ramp Intersection	AM	37.4	D	130.3	F
	PM	28.0	C	78.6	E
I-880 at Industrial Parkway West and Northbound Ramp Intersection	AM	18.5	C	53.7	F
	PM	21.1	C	21.3	C

Source: Kittelson & Associates, Inc, 2018
s/veh = vehicle delay per second; LOS = Level of Service

ROADWAY DEFICIENCIES

The pavement condition of Whipple Road, within the Caltrans right-of-way, is degraded and is in need of rehabilitation.

The I-880/Industrial Parkway West overcrossing and the I 880/Whipple Road undercrossing structures do not provide standard vertical clearances with the freeway mainline (see Table 1.2-2), requiring oversized loads to take circuitous routes through local roads to safely bypass these vertical constraints.

Table 1.2-2 Existing Vertical Clearance Deficiencies

Structure	Design Standard	Existing Condition	Net Vertical Deficiencies
I-880/Industrial Parkway West overcrossing	16 feet 6 inches	15 feet 1 inch	1 foot 5 inches
I-880/Whipple Road undercrossing	15 feet	14 feet 10 inches	2 inches

Source: Highway Design Manual Section 300 and vertical clearance signage

ACCESSIBILITY TO LOCAL DESTINATIONS

The I-880/Whipple Road-Industrial Parkway Southwest and I-880/Industrial Parkway West interchanges provide freeway access to important local destinations within the Industrial Technology and Innovation (ITI) Corridor, which contains the majority of the Hayward's industrial development, and is the main employment area for the city. The ITI Corridor is a crescent-shaped planning area located along the western and southwestern edge of Hayward's Urban Limit Line. Due to its centralized Bay Area location, freeway access, and relatively low land costs, the ITI Corridor has attracted a variety of warehouse and distribution facilities, food manufacturing companies, bio-technology firms, and high technology businesses.

Under the current configuration, the I-880/Industrial Parkway West Interchange provides limited access to and from the local arterial roadways that serve the ITI Corridor. This interchange provides on-ramps to northbound and southbound I-880, and one off-ramp from southbound I-880. However, there is no current off-ramp to Industrial Parkway West from northbound I-880, and traffic is forced to exit at the I-880/Whipple Road-Industrial Parkway Southwest Interchange located approximately 1 mile south.

The existing I-880/ Whipple Road-Industrial Parkway Southwest Interchange accommodates all ramp movements to and from I-880, but its current partial loop configuration makes it difficult for westbound Whipple Road traffic to access southbound I-880.

The current I-880/Whipple Road-Industrial Parkway Southwest and I-880/Industrial Parkway West interchanges' configurations create long traffic queues of vehicles waiting to enter or exit the freeway. Congestion and delay in the study area adversely affects efficient goods movement to and from the ITI Corridor.

MODAL INTERRELATIONSHIPS AND SYSTEM LINKAGES

There are currently no striped bike lanes along either Whipple Road or Industrial Parkway West where the roadways cross I-880, and both interchanges include high-speed free-flowing ramps (no stop sign or traffic signal) that present safety concerns for pedestrians and bicyclists. Whipple Road does not have a sidewalk along the south side, and the sidewalk along the north side is narrow and does not meet Americans with Disabilities Act (ADA) standards. The lack of facilities combined with the poor pavement conditions in the project area creates a gap that prevents the efficient movement of bicyclists and pedestrians across the I-880 corridor.

The I-880/Whipple Road-Industrial Parkway Southwest and I-880/Industrial Parkway West interchanges are identified by the cities of Hayward and Union City as corridors that need enhanced bicycle and pedestrian improvements to improve the multi-modal connectivity between the east and west sides of I-880. Both cities are in the process of updating their bicycle/pedestrian master plans to include bicycle and pedestrian improvements at both interchanges.

1.2.3 INDEPENDENT UTILITY AND LOGICAL TERMINI

Logical termini for a project are defined as rational end points for transportation improvements within the proposed project area. A project with independent utility is defined as improvements that are usable and provide a reasonable expenditure of funds even if no additional transportation improvements are made in the area.

As part of the traffic analysis conducted for this project, several operational improvements were evaluated in order to determine the project configuration that most effectively addressed the identified project needs to reduce traffic congestion and delay. In addition to identifying beginning and end points for the interchange improvements, the evaluation also considered the identification of an initial construction phase that would provide benefit to the travel corridor at a lower cost than the full project given limited project funding. Based on the findings of the evaluation, the start and end points for the project were defined.

Based on the traffic analysis it was determined that the project limits, centering around improvements to the I-880/Whipple Road-Industrial Parkway Southwest and I-880/Industrial Parkway West interchanges, show the most substantial benefits in future traffic operations along the local roadways and I-880 ramp termini intersections in the design year 2045. The selection of these logical termini, or end points, allow for a thorough review of environmental impacts as a result of construction and operation of the Build Alternatives. The proposed project is considered a single and complete project because it is not dependent on other capacity-increasing or operational improvements in order to realize mobility benefits. Further, individual project components also demonstrate independent utility for the same reason and may move forward as phased improvements.

The proposed changes to each individual interchange would provide the intended mobility benefits without any additional improvements, and auxiliary lanes would similarly improve traffic flow without the requirement of other improvements.

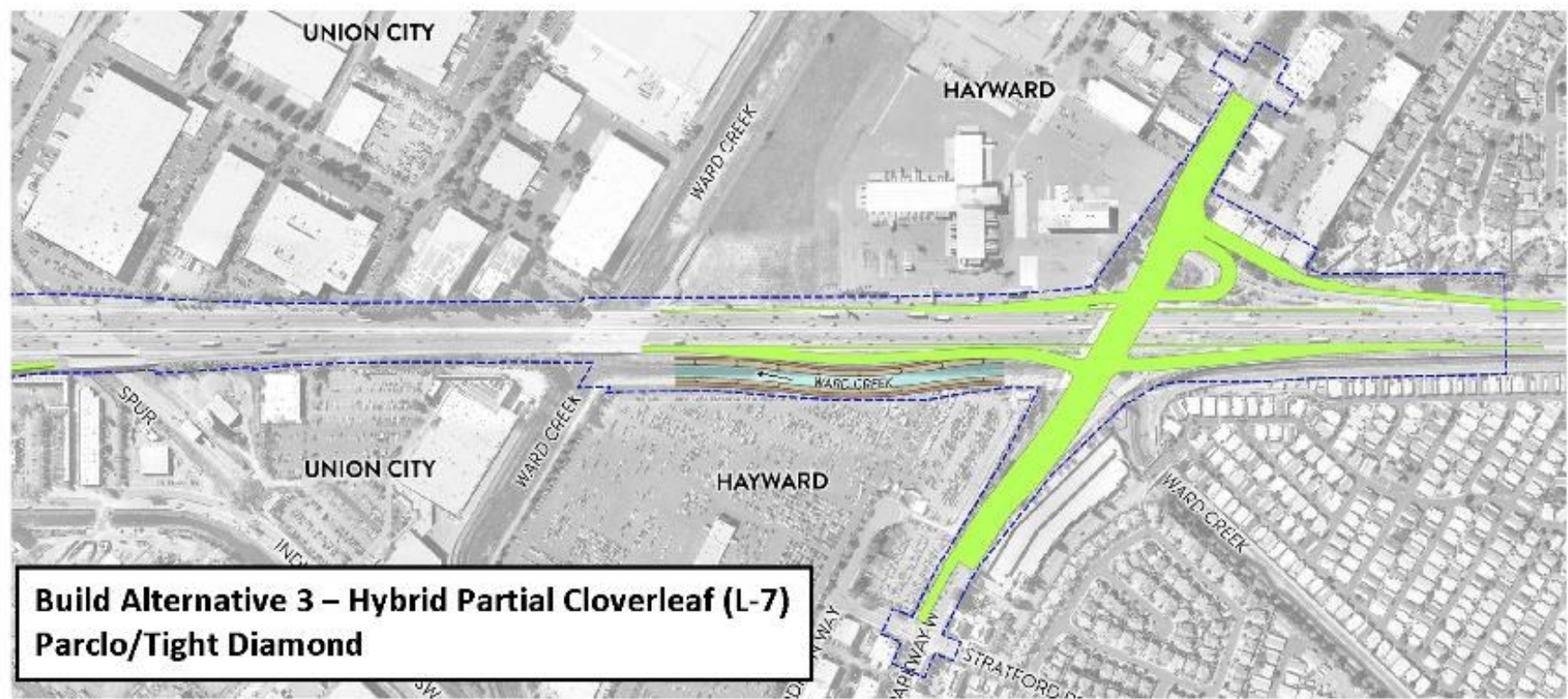
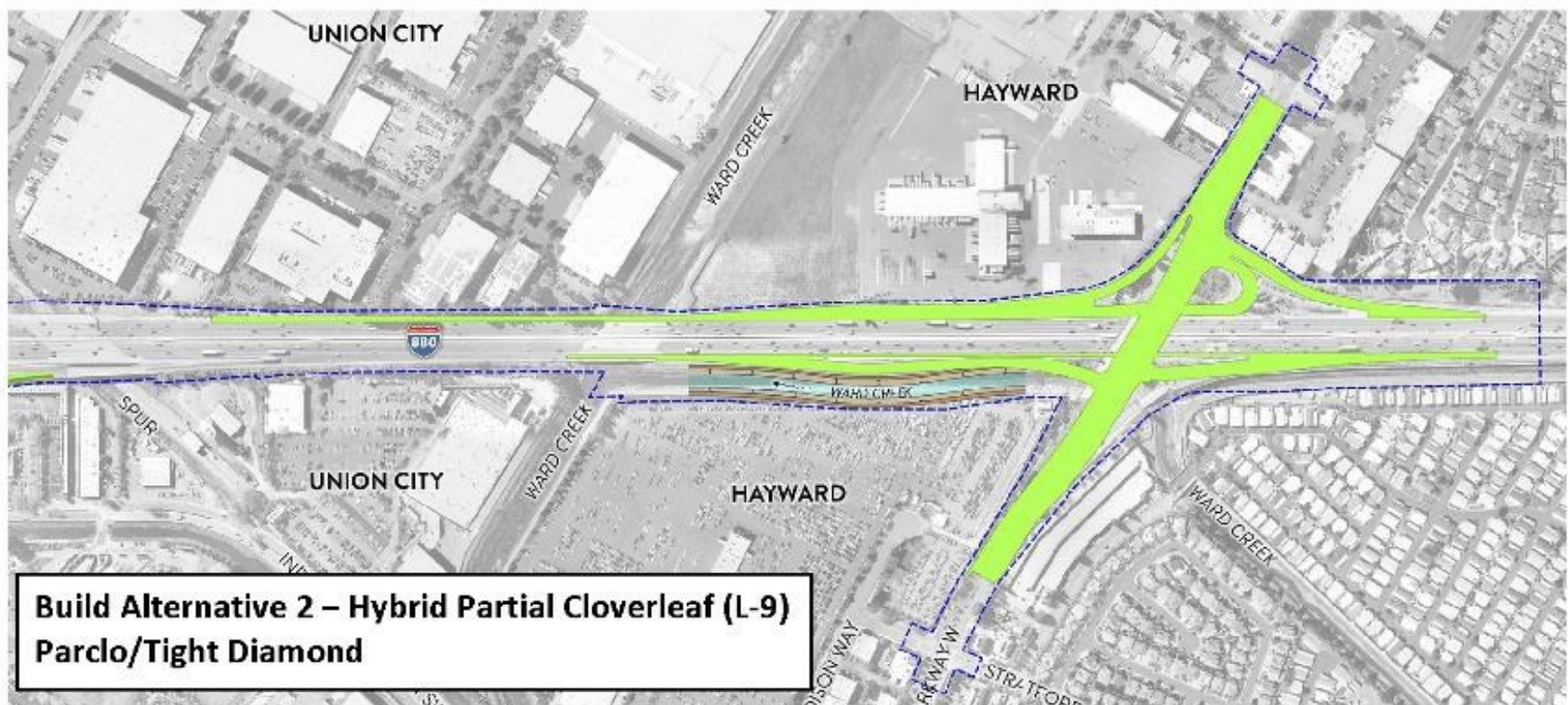
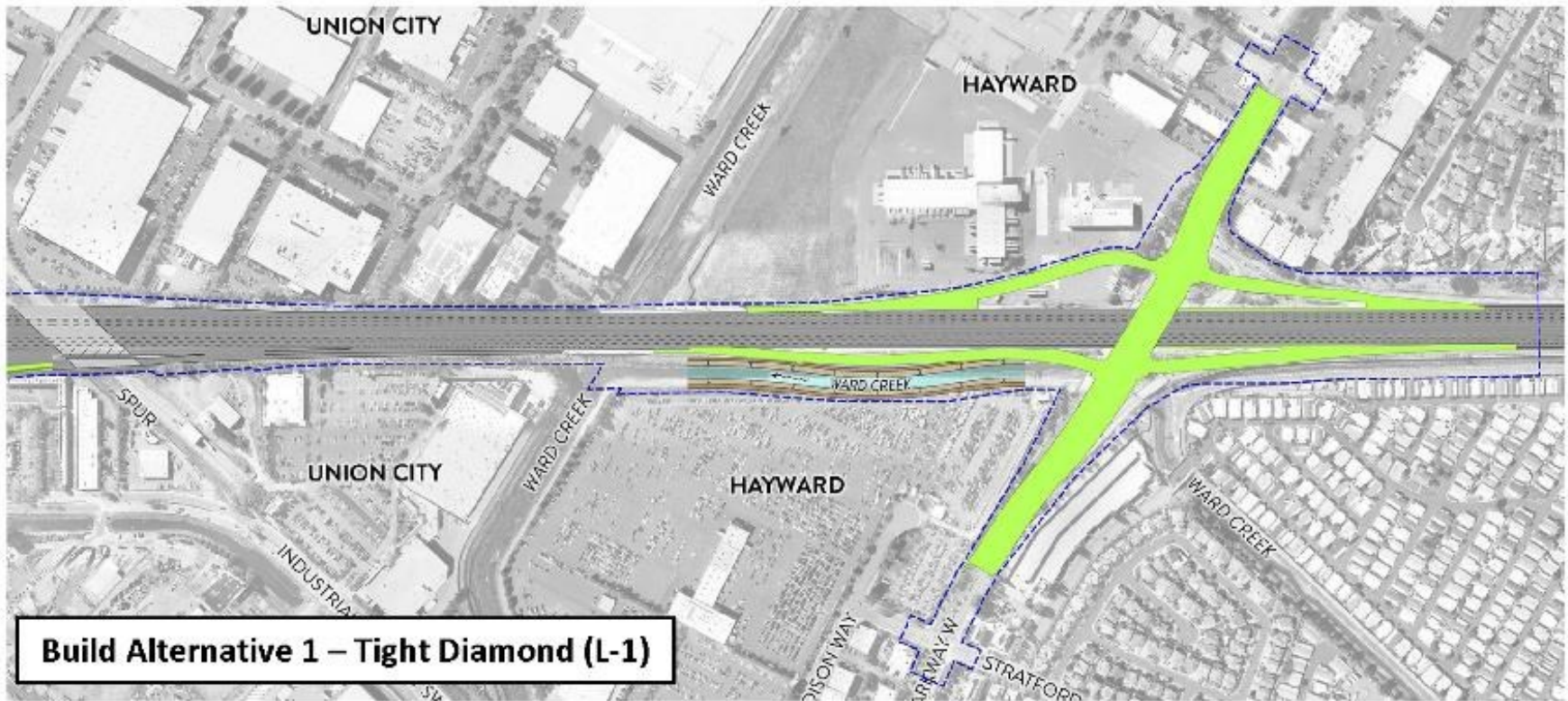
1.3 PROJECT DESCRIPTION

This section describes the proposed project and the project alternatives developed to meet the purpose and need of the project, while avoiding or minimizing environmental impacts. The alternatives considered and analyzed herein include “Build Alternative 1”, “Build Alternative 2”, “Build Alternative 3”, and the “No-Build Alternative”.

Implementation of the project would provide interchange and local road improvements along I-880 from 0.6 mile south of the I-880/Whipple Road-Industrial Parkway Southwest Interchange to 0.3 mile north of the I-880/Industrial Parkway West. The project would include interchange on- and off-ramp reconfigurations, modifications and/or replacement of bridge structures, local roadway realignments and restriping, and bicycle and pedestrian improvements in the cities of Hayward and Union City, in Alameda County.

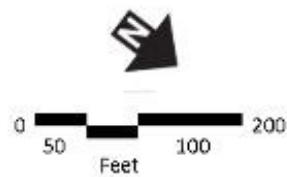
1.3.1 PROJECT ALTERNATIVES

The alternatives being evaluated are “Build Alternative 1”, “Build Alternative 2”, “Build Alternative 3”, and the “No-Build Alternative”. The differences between the Build Alternatives are related to the proposed southbound on-ramp and off-ramp configurations at the I-880/Industrial Parkway West Interchange. Build Alternative 1 would reconfigure the I-880/Industrial Parkway West Interchange to a tight diamond configuration. Build Alternative 2 would reconfigure the I-880/Industrial Parkway West interchange to a hybrid partial cloverleaf parclo/tight diamond configuration. Build Alternative 3 would reconfigure the I-880/Industrial Parkway West Interchange to a hybrid partial cloverleaf parclo/tight diamond configuration. The details of each Build Alternative (i.e., southbound on-ramp and off-ramp configurations) are described further below under the headings “Build Alternative 1”, “Build Alternative 2”, and “Build Alternative 3”. All three Build Alternatives include a design variation option at the I-880/Whipple Road interchange. All of the Build Alternatives would achieve the same improvements to the I-880/Whipple Road-Industrial Parkway Southwest Interchange. Figure 1.3-1 and Figure 1.3-2 illustrate the general configurations of the proposed interchange improvements.



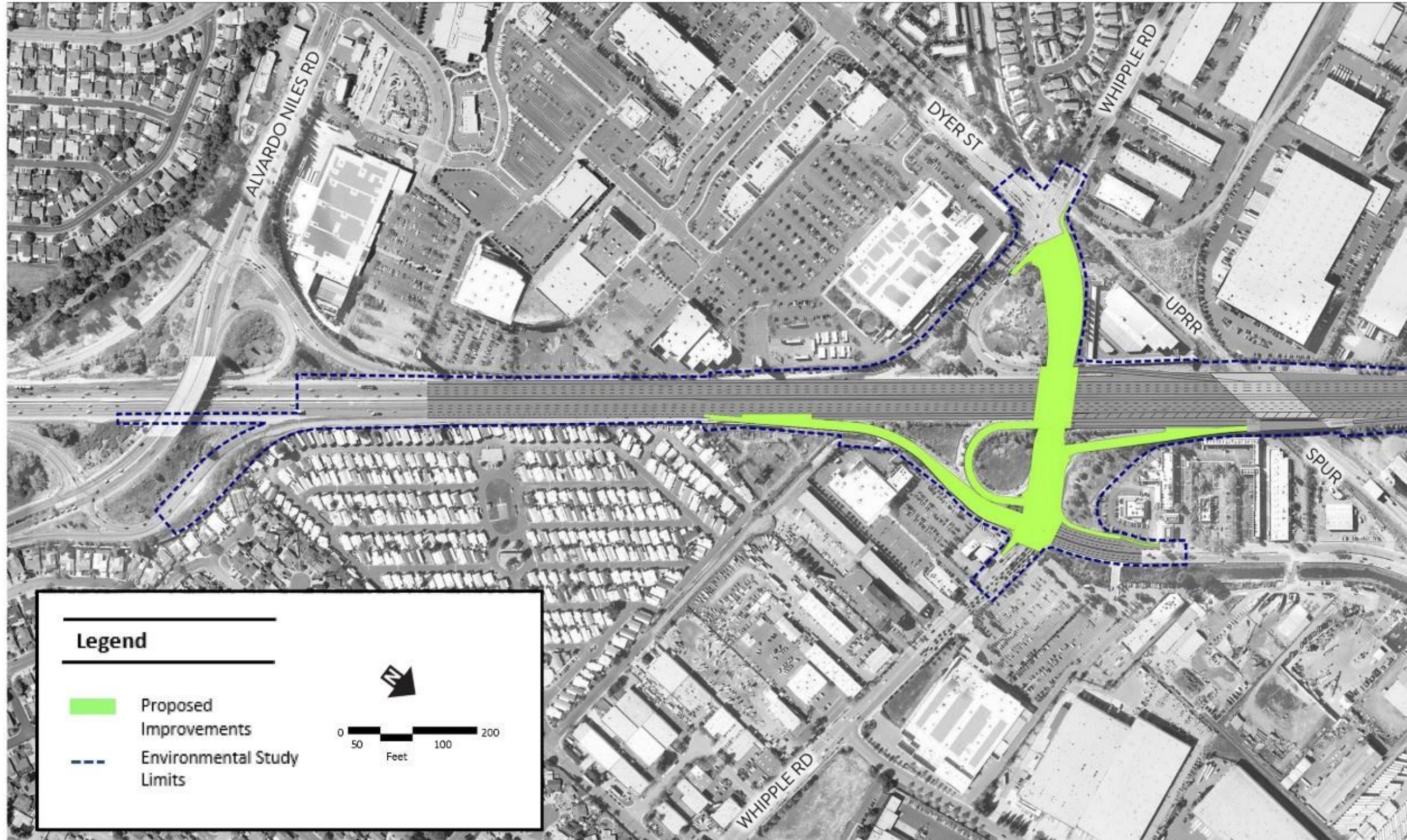
Legend

- Proposed Improvements
- Environmental Study Limits



Build Alternatives at the I-880/Industrial Parkway West Interchange

Figure **1.3-1**



Build Alternative at the 1-880/Whipple Road-Industrial Parkway Southwest Interchange

Figure

1.3-2

This project contains a number of standardized project measures which are employed on most, if not all, Caltrans projects and were not developed in response to any specific environmental impact resulting from the proposed project. These measures are addressed in more detail in the Environmental Consequences sections found in Chapter 2.0, Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures.

UNIQUE FEATURES OF ALTERNATIVES

BUILD ALTERNATIVE 1

I-880/Industrial Parkway West Interchange - Tight Diamond (L-1) Configuration

Build Alternative 1 would replace the existing I-880/Industrial Parkway West overcrossing structure with a structure to the north (see Figure 1.3-3). The northbound and southbound I-880 ramps to Industrial Parkway West would be reconfigured to a tight diamond (L-1) interchange, including the following improvements:

- Replace the I-880/Industrial Parkway West overcrossing (Bridge No. 33-0398) with a structure to the north. The structure would accommodate seven lanes of traffic and include dedicated bikeways and sidewalks in both directions (eastbound and westbound).
- Construct a two-lane northbound I-880 diagonal off-ramp to Industrial Parkway West. The approach to the I-880 off-ramp/Industrial Parkway West intersection would be widened to accommodate three turning lanes. The off-ramp would require a bridge be constructed over Ward Creek, which would connect to the new I-880/Industrial Parkway West overcrossing structure.
- Approximately 1,000 linear feet of Ward Creek would be realigned 75 feet east to accommodate the new northbound I-880 off-ramp to Industrial Parkway West.
- Realign the northbound I-880 diagonal on-ramp to the new I-880/Industrial Parkway West overcrossing structure. This would include the installation of a traffic signal.
- Widen and realign the existing southbound I-880 off-ramp to Industrial Parkway West to provide dual eastbound left turn lanes and a single westbound right turn lane.
- Construct a southbound I-880 diagonal on-ramp from Industrial Parkway West with two lanes (one general purpose and one high-occupancy vehicle [HOV] preferential lane).

Industrial Parkway West Structure and Roadway Improvements

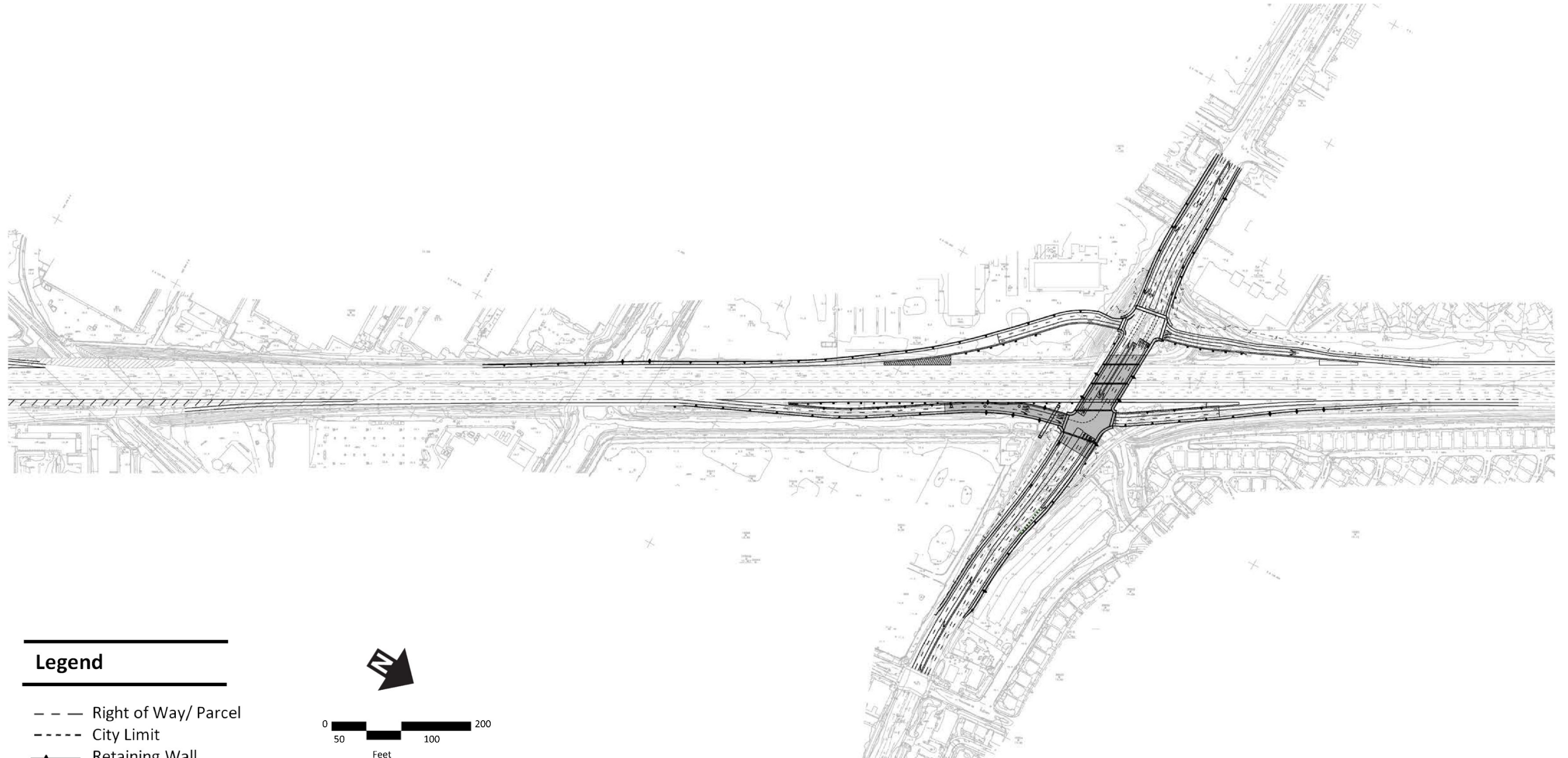
Build Alternative 1 would replace the I-880/Industrial Parkway West overcrossing (Bridge No. 33-0398) with a structure that would be aligned approximately 80 feet to the north of the current roadway alignment. The proposed structure would be 50 feet wider than the current four-lane Industrial Parkway West configuration, and would accommodate seven lanes of traffic, including dedicated 8-foot bike lanes and 6-foot sidewalks in both directions (eastbound and westbound). The structure would increase the vertical clearance of the overcrossing above Industrial Parkway West from 15 feet 1 inch to a minimum of 16 feet 6 inches.

Cast-in-drilled-hole concrete pile foundations are proposed for structures immediately adjacent to Ward Creek, and would be drilled to depths of up to 80 feet below ground surface. Localized dewatering may be required for foundation excavation. Groundwater conditions would be verified during the final design phase. The construction of Build Alternative 1 would require the net import of 71,000 cubic yards of soil (79,000 cubic yards of embankment, and 8,000 cubic yards of excavation).

The Industrial Parkway West widened lane configuration would continue east and west of the new structure, between Stratford Road and Hopkins Street. The roadway widening east and west of the structure would be accommodated within the existing public right-of-way (ROW).¹

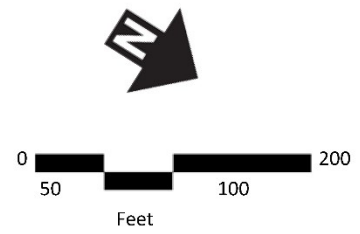
The widening east and west of the structure would generally conform to the existing roadway alignment and involve up to 3 feet of excavation including removing the existing paved shoulder to prepare the subgrade and place pavement. The pavement for widening would consist of aggregate subbase, aggregate base, and asphalt concrete for a total thickness of approximately 3 feet. The Industrial Parkway West widening would accommodate dedicated bikeways and sidewalks in both directions (eastbound and westbound) from Hopkins Street to approximately 250 feet west of Stratford Road.

¹ Throughout this document, the term “right-of-way” is used to refer to areas owned by a public entity which are used as, or support, the circulation network. This includes State, County, and local right-of-way.



Legend

- Right of Way/ Parcel
- City Limit
- Retaining Wall
- Concrete Barrier



I-880/Industrial Parkway West— Build Alternative 1 Tight Diamond (L-1) Configuration

Ramp Modifications

Under the current configuration, the I-880/Industrial Parkway West interchange provides on-ramps to northbound and southbound I-880, and one off-ramp from southbound I-880. Build Alternative 1 would eliminate the existing loop on-ramp to southbound I-880 and replace it with a diagonal on-ramp on the east side of I-880/Industrial Parkway West Interchange. The southbound I-880 diagonal on-ramp from Industrial Parkway West would have two lanes (one general purpose and one HOV preferential lane). Private property would be acquired in order to accommodate the southbound I-880 diagonal on-ramp. The existing southbound I-880 diagonal off-ramp to Industrial Parkway West would be realigned to “square up” the ramp terminus and would be widened at the approach to accommodate three turning lanes at the intersection. The improvements to the southbound I-880 diagonal off-ramp to industrial Parkway West would be accommodated within the existing state ROW.

Build Alternative 1 would construct a two-lane northbound I-880 diagonal off-ramp to Industrial Parkway West. The approach to the I-880 off-ramp/Industrial Parkway West intersection would be widened to accommodate three turning lanes. The off-ramp would include constructing a bridge over Ward Creek, which would connect to the I-880/Industrial Parkway West overcrossing structure.

Ward Creek

A trapezoidal earthen channel runs parallel to northbound I-880 and flows into Ward Creek outside of the project study area. This channel (Zone 3A, Line D) is owned and operated by the Alameda County Flood Control District (ACFCD). Approximately 1,000 linear feet of the channel would be realigned 75 feet east to accommodate the new northbound I-880 off-ramp to Industrial Parkway West. The realigned portion of the channel would remain earthen and would be similar in size to the existing dimensions in order to maintain hydraulic conveyance (approximately 45-foot wide and 7 to 10 feet high). Approximately 18,000 cubic yards of soil would be excavated/moved in order to realign the channel (a net zero import/export of soils). Maximum excavation depths to realign the channel would be 10 feet below ground surface. In order to realign the channel, water flows would be temporarily diverted around construction activities with coffer dams at locations both upstream and downstream of the project limits. This would occur during the low-flow period, between April 15 and August 15 and a *temporary* culvert would be installed through the construction limits to maintain limited water flows.

I-880/Whipple Road-Industrial Parkway Southwest Interchange

Build Alternative 1 would replace the three existing I-880/Whipple Road undercrossing structures with one undercrossing structure, improve bicycle and pedestrian facilities through the interchange area along Whipple Road, and include the following improvements to the interchange and local roads (see Figure 1.3-4):

- Widen Whipple Road between Industrial Parkway Southwest and Dyer Street from five lanes to eight lanes (three westbound lanes and five eastbound lanes).
- Widen Industrial Parkway Southwest from five lanes to six lanes at the Whipple Road intersection.
- Construct two Class I shared pedestrian and bicycle paths along the north and south side of Whipple Road, between Dyer Street and Industrial Parkway Southwest.
- Widen the existing northbound I-880 diagonal off-ramp to Whipple Road-Industrial Parkway Southwest from one lane to two lanes.
- Reconfigure the northbound I-880 off-ramp/Whipple Road/Industrial Parkway Southwest intersection to accommodate four turning lanes at the ramp terminus.
- Add an auxiliary lane on northbound I-880 from the Alvarado Niles Road interchange to the Whipple Road-Industrial Parkway Southwest Interchange.
- Realign and widen the northbound I-880 loop on-ramp from Whipple Road from one lane to two lanes (one general purpose lane and one HOV preferential lane).
- Realign the northbound I-880 diagonal on-ramp to “square-up” the ramp terminus intersection.

I-880/Whipple Road Undercrossing Structure and Roadway Improvements

The existing I-880/ Whipple Road-Industrial Parkway Southwest Interchange accommodates all ramp movements to and from I-880, but its current partial loop configuration makes it difficult for westbound Whipple Road traffic to access southbound I-880. Build Alternative 1 would maintain all current turning movements at this interchange, but would realign and widen the northbound I-880 loop on-ramp from Whipple Road from one lane to two lanes (one general purpose lane and one HOV preferential lane). All ramp termini would be “squared up” to the intersections. The northbound off-ramp improvement would reduce traffic queues, and the squared-up intersections would provide greater safety at crosswalks.

Build Alternative 1 would replace the current I-880 mainline structure (No. 33-0245), the northbound I-880 on-ramp structure (No. 33-0245S), and the southbound I-880 off-ramp structure (No. 33-0245K) with one continuous undercrossing bridge structure. The new structure would increase the vertical clearance between I-880 and Whipple Road from 14 feet 10 inches (current) to a minimum of 16 feet 6 inches.

Cast-in-drilled-hole concrete pile foundations are proposed for the undercrossing structures and would be drilled to depths of up to 80 feet below ground surface. The construction of the new structure and ramps would result in a net export of approximately 22,000 cubic yards of soil (26,000 cubic yards exported, and 4,000 cubic yards imported).

Whipple Road would be widened between Industrial Parkway Southwest and Dyer Street from five lanes to eight lanes (three westbound lanes and five eastbound lanes). The widening would generally conform to the existing roadway alignment and involve up to 3 feet of excavation including removing the existing paved shoulder to prepare the subgrade and place pavement. The pavement for widening would consist of aggregate subbase, aggregate base and asphalt concrete for a total thickness of approximately 3 feet.

Industrial Parkway Southwest would be widened to add an additional westbound lane approaching the Whipple Road Intersection. The additional lane along this segment of Industrial parkway Southwest would be accomplished by widening the westbound shoulder which would require up to 3 feet of excavation to remove the existing sidewalk, prepare the subgrade, and place pavement.

Bicycle and Pedestrian Improvements

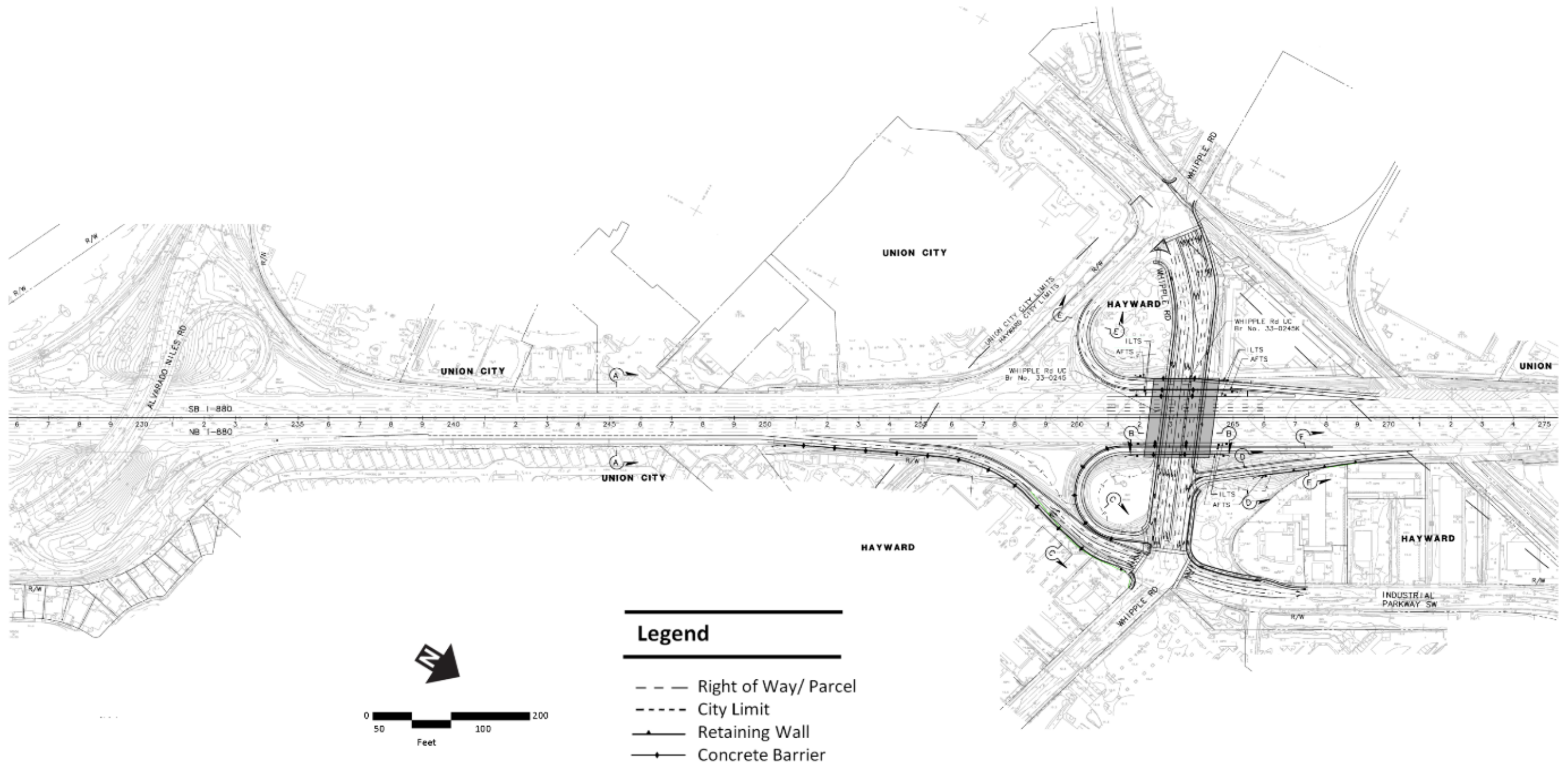
Eight-foot-wide dedicated bike paths and six-foot wide sidewalks would be constructed in both directions of Whipple Road.

Auxiliary Lane

Build Alternative 1 would create an auxiliary lane along northbound I-880 from the Alvarado Niles Road interchange to the Whipple Road-Industrial Parkway Southwest Interchange by restriping the outermost travel lane and shoulder between the two interchanges. No outside widening would be required to accommodate the auxiliary lane.

Design Variation 1 – Maintain Existing Whipple Road Undercrossing Structures

Design Variation 1 of Build Alternative 1 would preserve the three existing Whipple Road Undercrossing structures and make improvements to the interchange and local roads within the constraints of the existing structures (see Figure 1.3-5). This design variation includes the ramp and auxiliary lane modification improvements described above, in addition to the following improvements:



I-880/Whipple Road-Industrial Parkway Southwest Interchange – Build Alternative 1

Figure 1.3-4

- Restripe Whipple Road near the Industrial Parkway Southwest Intersection to improve left turn movements from Eastbound Whipple Road to Northbound Industrial Parkway Southwest.
- Widen Industrial Parkway Southwest to 6 lanes at the Whipple Road intersection.
- Widen the existing sidewalk along the north and south side of Whipple Road to accommodate pedestrians and bicycles on shared Class I paths by constructing retaining walls at the existing undercrossing bridge abutments.

The retention of the existing bridges and construction of the new ramps would result in a net export of approximately 17,000 cubic yards of soil (21,000 cubic yards exported, and 4,000 cubic yards imported).

Instead of the dedicated bike path and sidewalks in each direction, the design variation would accommodate pedestrians and bicycles on a shared 14-foot-wide Class I path.

BUILD ALTERNATIVE 2

I-880/Industrial Parkway West Interchange –Hybrid Partial Cloverleaf (L-9) Parclo/Tight Diamond Configuration

Build Alternative 2 is identical to Build Alternative 1, with the exception of the proposed southbound I-880/Industrial Parkway West on-ramp and off-ramp configurations (see Figure 1.3-6). Instead of demolishing the existing loop on-ramp to southbound I-880 and replacing it with a diagonal on-ramp, Build Alternative 2 would leave the existing loop on-ramp in place. Build Alternative 2 would add a new diagonal on-ramp to southbound I-880, however the alignment of the on-ramp would intersect eastbound Industrial Parkway West at a flat, 4.5 degree angle west of the ramp intersection and would follow a sweeping, curvilinear alignment, until intersecting with the loop on-ramp. The diagonal on-ramp in Build Alternative 2 differs from the on-ramp proposed under Build Alternative 1 in terms of its footprint and the resulting intersection with Industrial Parkway West. In addition, the I-880/Industrial Parkway West off-ramp would be pushed further west to accommodate retention of the existing loop on-ramp. Because both the existing loop on-ramp and a new diagonal on-ramp would be constructed, Build Alternative 2 is considered a hybrid partial cloverleaf (L-9) parclo/tight diamond interchange configuration.

The construction of Build Alternative 2 would require the net import of 51,000 cubic yards of soil (66,000 cubic yards of embankment, and 15,000 cubic yards of excavation) which represents 20,000 cubic yards less net import than Build Alternative 1.

I-880/Whipple Road-Industrial Parkway Southwest Interchange

There are no differences in the proposed improvements to the I-880/Whipple Road-Industrial Parkway Southwest interchange, including the design variation, between Build Alternatives 1 and 2.

BUILD ALTERNATIVE 3**I-880/Industrial Parkway West Interchange – Hybrid Partial Cloverleaf (L-7) Parclo/Tight Diamond Configuration**

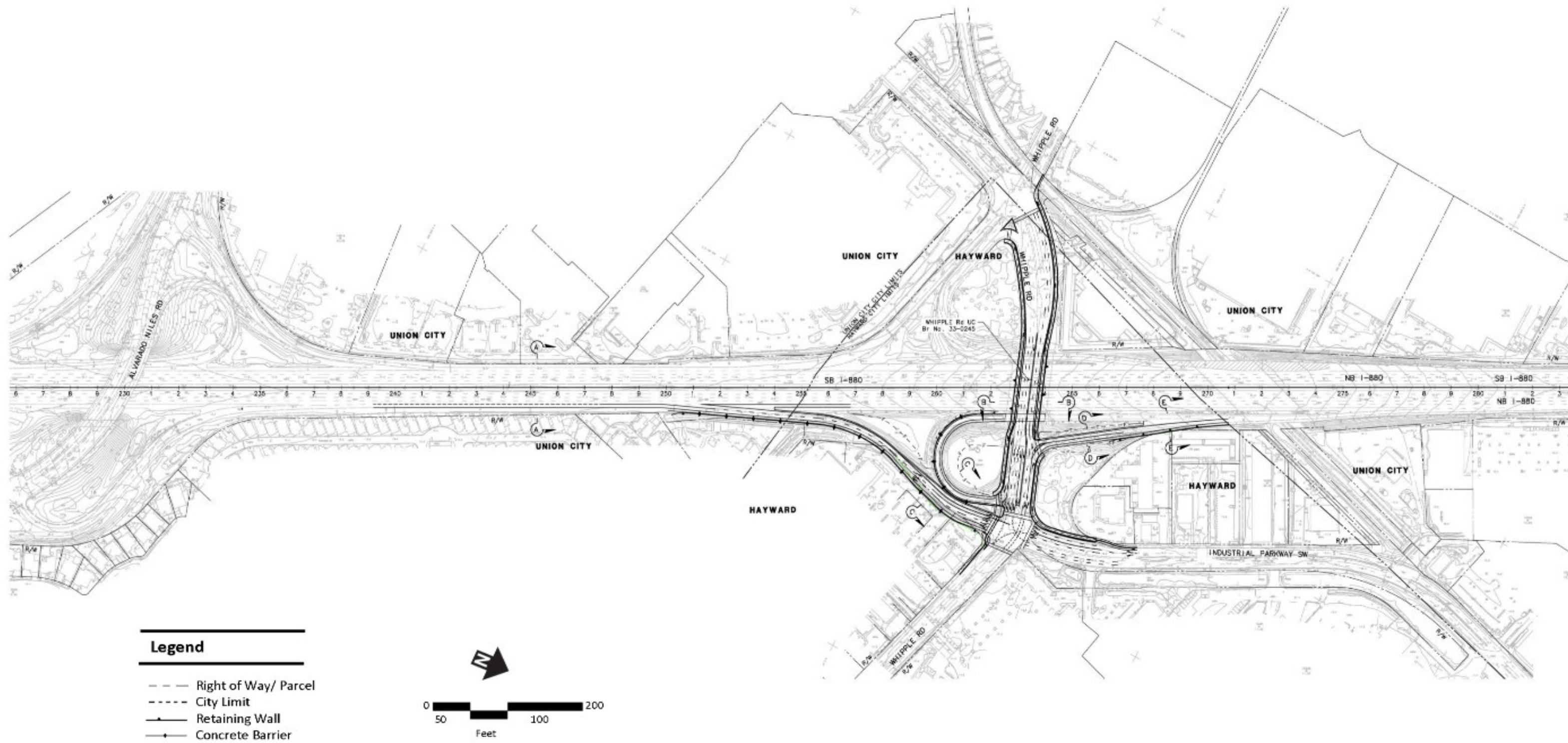
Build Alternative 3 is identical to Build Alternatives 1 and 2, with the exception of the proposed southbound I-880/Industrial Parkway West on-ramp and off-ramp configurations (see Figure 1.3-7). Unlike Build Alternative 1 and 2, Build Alternative 3 would retain the existing loop on-ramp as the only southbound on-ramp at the I-880/Industrial Parkway West interchange. Compared to Build Alternative 1 and 2, the I-880/Industrial Parkway West off-ramp would be further west and widened to accommodate retention of the existing loop-on ramp while providing necessary lane improvements to accommodate southbound traffic. Because the existing loop on-ramp would be preserved and the southbound I-880 off-ramp would be widened, Build Alternative 3 is considered a hybrid partial cloverleaf (L-7) parclo/tight diamond interchange configuration.

The proposed improvements to the northbound I-880 on- and off-ramps, including the realignment of Ward Creek, are identical between all the Build Alternatives. All of the local roadway widening and proposed bicycle and pedestrian improvements under Build Alternative 1 would also be constructed under Build Alternative 3, except one bike and pedestrian crossing proposed at the southbound I-880 diagonal on-ramp would not be required, as a diagonal on-ramp would not be constructed.

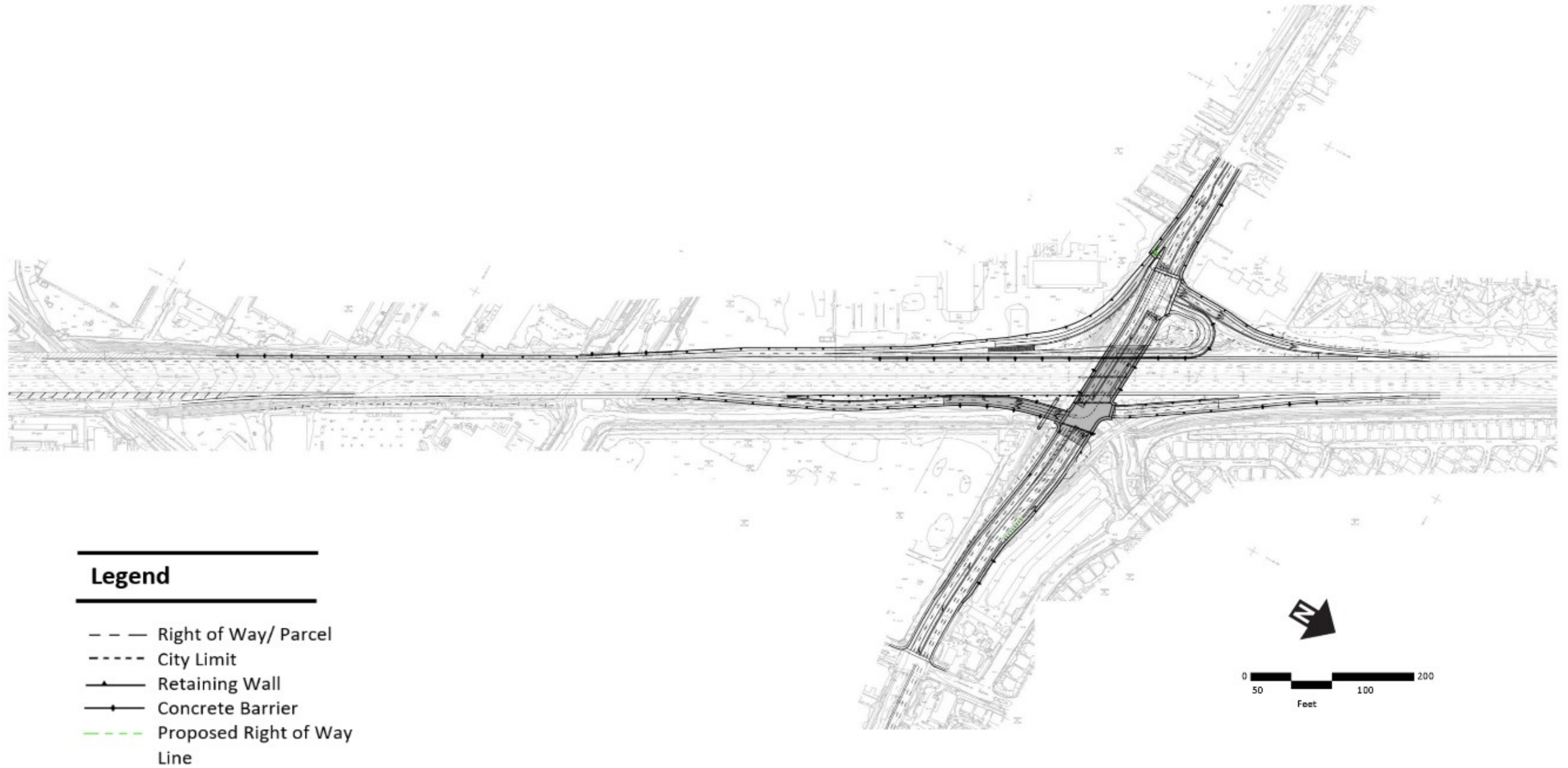
The construction of Build Alternative 3 would require the net import of 53,000 cubic yards of soil (60,000 cubic yards of embankment and 7,000 cubic yards of excavation) which represents 18,000 cubic yards less net import than Build Alternative 1 and 2,000 cubic yards more net import than Build Alternative 2.

I-880/Whipple Road-Industrial Parkway Southwest Interchange

There are no differences in the proposed improvements to the I-880/Whipple Road-Industrial Parkway Southwest Interchange, including the design variation, between the Build Alternatives.



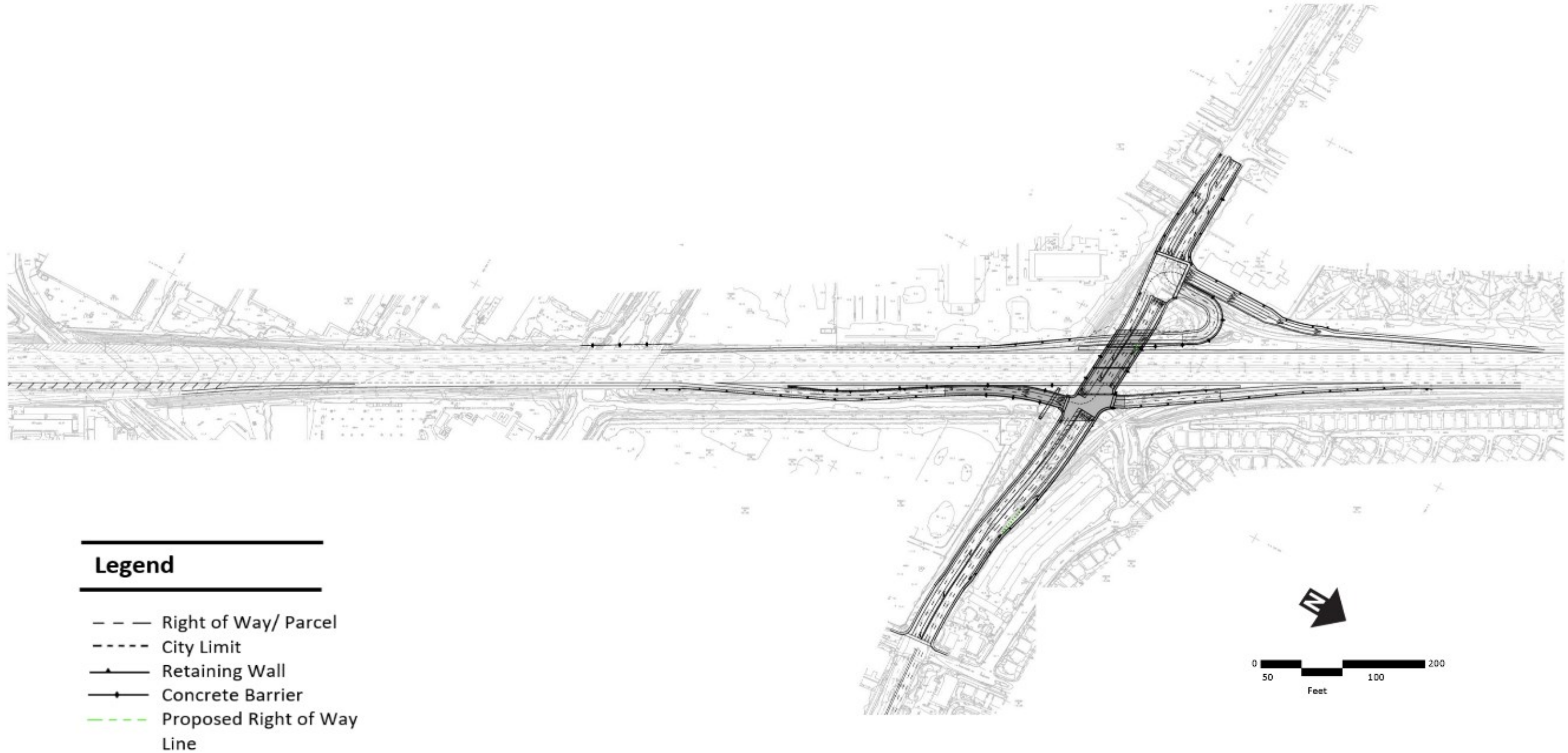
Whipple Variation 1 Figure 1.3-5



I-880/Industrial Parkway West Interchange—Build Alternative 2 Hybrid Partial Cloverleaf (L-9) Parclo/Tight Diamond Configuration

Figure

1.3-6



I-880/Industrial Parkway West Interchange—Build Alternative 3 Hybrid Partial Cloverleaf (L-7) Parclo/Tight Diamond Configuration

Figure 1.3-7

1.3.2 CONSTRUCTION – BUILD ALTERNATIVES

The project is anticipated to take approximately 32 months and begin in Spring 2023. All Build Alternatives would follow the same construction staging sequence.

- Stage 1 would include the initial phases of the I-880/Industrial Parkway West overcrossing replacement, constructing a portion of the northbound I-880/Industrial Parkway West diagonal on-ramp, and constructing a portion of the northbound I-880/Whipple Road loop on-ramp. Stage 1 would also include the realignment of Ward Creek and the construction of the southbound I-880/Industrial Parkway West on-ramp (Build Alternatives 1 and 2 only). Stage 1 of project construction is anticipated to take one year.
- Stage 2 would complete the construction of the Industrial Parkway West overcrossing structure, the northbound I-880/Industrial Parkway West diagonal on-ramp, and the northbound I-880/Whipple Road loop on-ramp. Stage 2 would also include the construction of the northbound I-880/Industrial Parkway West diagonal off-ramp over the realigned portion of Ward Creek. This stage would initiate the realignment of the southbound I-880 off-ramp to Industrial Parkway West for Alternatives 1 and 2 and would widen the southbound I-880 off-ramp for Build Alternative 3. Stage two would also construct the northbound I-880 off-ramp to Whipple Road, and initiate construction of the diagonal on-ramp from Whipple Road. Stage 2 of project construction is anticipated to take nine months.
- Stage 3 would include construction of conform paving at the west and east approaches of the I-880/Industrial Parkway West overcrossing, the completion of the southbound I-880 off-ramp to Industrial Parkway West, and the northbound I-880 diagonal on-ramp from Whipple Road. Stage 3 would repave Whipple Road. Stage 3 is anticipated to take six months.
- Stage 4 would include constructing the remaining improvements on Industrial Parkway West and Whipple Road. This final stage of construction is anticipated to take five months.

Construction staging areas (i.e., the storage of materials and equipment) are anticipated to be accommodated within Caltrans' ROW. The largest potential construction staging area would be within the northwest corner of the Industrial Parkway West Interchange, adjacent to the southbound I-880 off-ramp. Final determination of construction staging areas for the project would be reviewed as part of the final design phase of the project, in conjunction with potential contractors, and would be carefully reviewed to ensure that the staging areas are within the project footprint evaluated in this environmental document.

Transportation System Management (TSM) and Transportation Demand Management (TDM) Alternatives

System management strategies increase the efficiency of existing transportation facilities without increasing the number of through lanes. Examples of system management strategies include ramp metering, auxiliary lanes, turning lanes, reversible lanes and traffic signal coordination. System management also encourages a unified urban transportation system that integrates multiple forms of transportation modes such as pedestrian, bicycle, automobile, rail, ferry, and mass transit. Although TSM measures alone could not satisfy the purpose and need of the project, the following Transportation System Management measures have been incorporated into the Build Alternatives for this project:

- Replace the I-880/Industrial Parkway West overcrossing (Bridge No. 33-0398) with a structure that would include dedicated bikeways and sidewalks in both directions
- Create a new auxiliary lane on northbound I-880 from the Alvarado Niles Road interchange to the I-880/Whipple Road-Industrial Parkway Southwest Interchange
- Add traffic signal coordination at the new I-880/Industrial Parkway West overcrossing structure
- Realign the existing ramp to "square up" the ramp terminus at the northbound I-880 loop on-ramp and Whipple Road intersection. Accommodate 8-foot-wide Class IV separated bikeways, with a protective buffer between the bike lane and motorist travel lanes (Design Variation 1)
- Accommodate 6- to 10- foot sidewalks in both directions of Whipple Road (Design Variation 1)

There are several TDM strategies within the San Francisco Bay Area that are used to reduce the number of vehicle trips within the I-880 corridor. Rideshare offers carpoolers reduced bridge tolls as well as access to carpool lanes.

There are also vanpools for larger groups of commuters. TDM may also involve the provision of contract funds to regional agencies that are actively promoting ridesharing, maintaining rideshare databases, and providing limited rideshare services to employers and individuals. Increased vehicle occupancy reduces traffic volumes during peak commuting periods; however, without the construction of the improvements described above, successful implementation of a TDM alternative would not substantially improve the safety and operation of the freeway and local roadways within the project area. A TDM alternative by itself would not satisfy the purpose of the project.

No-Build (No-Action) Alternative

Under the No Build Alternative, none of the project features described under the Build Alternatives would be constructed. The existing transportation facilities within the project area would remain unchanged except for planned and programmed improvements to convert the northbound and southbound HOV lanes to express lanes. No other projects are planned within the project limits (see the cumulative analysis section under each environmental topic in Chapter 2.0, Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures for a detailed discussion). Under the No Build Alternative, the purpose and need of the project would not be met because the existing and future deficiencies at the interchange would not be addressed. Traffic operations and bicycle and pedestrian access at the I-880/Whipple Road-Industrial Parkway Southwest and I-880/Industrial Parkway West interchanges would not be improved.

The No Build Alternative is the baseline for comparing environmental impacts under the NEPA.

Comparison of Alternatives

1.3.3 PERMITS AND APPROVALS NEEDED

Table 1.3-1 identifies the permits and approvals that would be required for project construction.

Table 1.3-1 Permits and Approvals Needed

Agency	Permit/Approval	Status
United States Army Corps of Engineers	Section 404, Clean Water Act, Permit – Individual	Issued during the design phase
California Department of Fish and Wildlife	1602 Streambed Alteration Agreement	Issued during the design phase
Regional Water Quality Control Board	Section 401, Clean Water Act, Certification	Issued during the design phase

Agency	Permit/Approval	Status
State Historic Preservation Officer	Concurrence on Eligibility Determinations	Issued prior to project approval; request for concurrence submitted to SHPO on March 23, 2020. Concurrence was received on April 14, 2020.
Metropolitan Transportation Commission Air Quality Conformity Task Force/Federal Highway Administration	Regional Air Quality Conformity	Issued prior to project approval

2.0 AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES, AND AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

As part of the scoping and environmental analysis carried out for the project, the following environmental issues were considered but either found not to be present in the study area or the Build Alternatives would have no adverse impact. As a result, there is no further discussion about these issues in this document (see Table 2.0-1).

Table 2.0-1 Environmental Issues Considered but Found to Have No Identified Adverse Impacts

Environmental Issue	Description
Farmlands/Timberlands	The project site is not located near any prime farmland, unique farmland, or land of statewide or local importance according to the California Department of Conservation's Farmland Mapping and Monitoring Program (FMMP). ² The project site is not located near any land protected under the Williamson Act. ³
Growth	Project improvements proposed under the Build Alternatives are freeway operational improvements that would not increase the capacity of I-880, create new access to the local communities, or directly or indirectly induce growth. While these improvements would provide additional lanes at local roadway intersections, the widened roadways would serve to improve traffic movement within the existing interchanges. As such, there would be no change in the local roadway capacity. Improvements would indirectly support improved access to the City of Hayward ITI Corridor where industrial growth is planned.

² California Department of Conservation, 2016.

³ Ibid.

CHAPTER 2.0 AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES, AND
AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Environmental Issue	Description
Coastal Zone	The Coastal Zone Management Act of 1972 is the primary federal law enacted to preserve and protect coastal resources. California developed a coastal zone management plan and enacted its own law, the California Coastal Act of 1976, to protect the coastline. The project site is not located near a designated coastal zone according to the California Coastal Commission and the San Francisco Bay Plan (Bay Plan). ⁴ The Bay Plan is under the jurisdiction of the San Francisco Bay Conservation and Development Commission (BCDC).
Wild and Scenic Rivers	The project site is not located near any wild and scenic rivers according to the National Wild and Scenic Rivers System. ⁵

⁴ San Francisco Bay Conservation and Development Commission (BCDC), 2012. *Bay Plan, Map 6*. Available online at: <https://www.bcdc.ca.gov/pdf/bayplan/bayplan.pdf>; last accessed: April 2020.

⁵ National Wild and Scenic Rivers System, 2020. *California*. Available online at: <https://www.rivers.gov/california.php>; last accessed: April 2020.

2.1 HUMAN ENVIRONMENT

2.1.1 LAND USE

This section evaluates impacts associated with land use and planning that could occur with implementation of the project. Sources of information used to prepare the analysis include:

- City of Hayward General Plan (2014)
- City of Union City General Plan (2002)
- City of Hayward Zoning Ordinance
- Union City Zoning Ordinance
- Plan Bay Area (2040)
- Alameda County General Plan (2000)
- *Community Impact Assessment* (CIA) prepared for the project

CONSISTENCY WITH STATE, REGIONAL, AND LOCAL PLANS AND PROGRAMS

Local Regulations

Plan Bay Area

Plan Bay Area 2040 is an updated long-range RTP and Sustainable Communities Strategy (SCS) for the nine-county San Francisco Bay Area. This document discusses how the Bay Area will grow over the next two decades and identifies transportation and land use strategies to enable a more sustainable, equitable and economically vibrant future.⁶

Alameda County General Plan

The Alameda County General Plan is a long-range policy document approved by the Board of Supervisors to guide physical, economic, and environmental growth. State law requires the County to have a General Plan which contains seven elements: Land Use, Circulation,

⁶ Plan Bay Area 2040, 2019. *Plan Bay Area 2040 Final Plan, About*. Available online at: <http://2040.planbayarea.org/about>; last accessed: October 2019

Housing, Open Space, Conservation, Safety and Noise. The plan expresses the County's vision for the future and is the roadmap for achieving the community's desired quality of life.⁷

City of Hayward

City of Hayward General Plan

A portion of the project area, inclusive of the I-880/Industrial Parkway West and the I-880/Whipple Road-Industrial Parkway Southwest interchanges is located within the City of Hayward. In these areas the surrounding land uses are governed by the City's General Plan. The City's General Plan is the comprehensive planning document which governs development within the City. The plan sets fourth goals, policies, and programs for the growth and development of Hayward. The following policies are relevant to the project:

- | | |
|----------------|--|
| Policy LU-1.13 | The City shall strive to develop and maintain local plans and strategies that are consistent with the Regional Transportation Plan and the SCS to qualify for State transportation funding and project CEQA streamlining. |
| Policy LU-2.18 | The City shall work with the Alameda CTC and the MTC to consider establishing new Priority Development Areas during future updates to the RTP and SCS. |
| Policy M-1.1 | The City shall provide a safe and efficient transportation system for the movement of people, goods, and services through, and within Hayward. |
| Policy M-1.2 | The City shall promote development of an integrated, multi-modal transportation system that offers desirable choices among modes including pedestrian ways, public transportation, roadways, bikeways, rail, and aviation. |

⁷ County of Alameda, 2019. *General Plan, Specific Plans & Ordinances, General Plan*. Available online at: <https://www.acgov.org/cda/planning/generalplans/index.htm>; last accessed: October 2019

- Policy M-1.5 The City shall consider flexible Level of Service (LOS) standards, as part of a multimodal system approach, for projects that increase transit-ridership, biking, and walking in order to reduce air pollution, energy consumption, and greenhouse gas emissions.
- Policy M-2.1 The City shall continue to coordinate its transportation planning with regional agencies (Caltrans, MTC and Alameda CTC) and adjoining jurisdictions.
- Policy M-2.3 The City shall work with the MTC, Caltrans, Bay Area Rapid Transit (BART), Alameda-Contra Costa Transit District (AC Transit), and adjacent communities to improve city roadways, pedestrian ways, bicycle facilities, and transit corridors to connect with neighboring and regional transportation networks and contribute to a regional multimodal transportation system.
- Policy M-3.1 The City shall provide safe, comfortable, and convenient travel along and across streets to serve all users, including pedestrians, the disabled, bicyclists and motorists, movers of commercial goods, and users and operators of public transportation.

Union City Zoning Ordinance

The Union City Zoning Ordinance is an evolving set of regulations that define how property in specific zones within Union City can be used. The purpose is to divide a municipality into residential, commercial, and industrial districts or zones.

Union City

Union City General Plan

Small portions of the project site between the I-880/Industrial Parkway West and I-880/Whipple Road-Industrial Parkway Southwest interchanges and just south of the I-880/Whipple Road-Industrial Parkway Southwest Interchange are in Union City. In these areas, the surrounding land uses are governed by the City's General Plan. The Union City General Plan is the comprehensive planning document which governs development within the City. The plan sets fourth goals, policies, and programs for the growth and development of Union City. The following policies are relevant to the project:

- Policy LU-D.6.1 The City shall require traffic circulation, road widening, and other street improvements (especially to streets surrounding Union Landing) to have a minimum adverse effect on adjoining properties and neighborhoods.
- Policy TR-A.1.2 The City shall monitor traffic flow problems and shall, to the extent feasible, improve capacity through improvements such as traffic signals, intersection widening, lane configurations, and basic traffic controls.
- Policy TR-A.1.13 The City shall control the number of direct access points to Route 84, Mission Boulevard, Decoto Road, Union City Boulevard, Alvarado Boulevard, Dyer Street, Whipple Road and Alvarado-Niles Road to maintain traffic flow and minimize potential for accidents.
- Policy TR-A.1.16 The City shall work collaboratively with the City of Hayward to improve, beautify and widen Whipple Road to enhance its capacity to serve as the major east-west truck route.

City of Hayward Zoning Ordinance

The City of Hayward Zoning Ordinance is an evolving set of regulations that define how property in specific zones within Hayward can be used. The purpose is to divide a municipality into residential, commercial, and industrial districts or zones.

Table 2.1.1-1 Consistency with State, Regional, and Local Plans and Programs

General Plan Policy	Build Alternatives	No-Build Alternative
Regional Transportation Plan	Consistent. The project is listed in the RTP.	Not Consistent. Under the No-Build Alternative, this anticipated road improvement project planned in the RTP would not be implemented and traffic congestion would continue to worsen.

CHAPTER 2.1 AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES,
AND AVOIDANCE MINIMIZATION AND/OR MITIGATION MEASURES

General Plan Policy	Build Alternatives	No-Build Alternative
Plan Bay Area	Consistent. The project is listed in Plan Bay Area's assumptions for planned roadway improvements.	Not Consistent. Under the No-Build Alternative, this anticipated road improvement project would not be implemented.
Hayward General Plan Consistency		
Policy LU-1.13: Local Plan Consistency with Regional Plans	Consistent. The project is consistent with the RTP and the Sustainable Communities Strategy and qualifies for state transportation funding and project streamlining under CEQA.	Not Consistent. Under the No-Build Alternative, this anticipated road improvement project would not be implemented.
Policy LU-2.18: Future Priority Development Areas	Consistent. The project is consistent with the RTP and the Sustainable Communities Strategy (SCS) and would not impact Priority Development Areas.	Consistent. The No Build Alternative would not require cooperation with the Alameda CTC or the MTC.
Policy M-1.1: Transportation System	Consistent. The project would increase the efficiency of transportation through and within Hayward by decreasing highway congestion and implementing safe bike and pedestrian paths.	Consistent. The No-Build Alternative would not affect the efficiency Hayward's of transportation system.
Policy M-1.2: Multimodal Choices	Consistent. The project promotes the development of multi-modal transportation by improving pedestrian and bicycle access and traffic operations.	Not Consistent. The No-Build Alternative would not promote the development of multi-modal transportation options through and within Hayward.

CHAPTER 2.1 AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES,
AND AVOIDANCE MINIMIZATION AND/OR MITIGATION MEASURES

General Plan Policy	Build Alternatives	No-Build Alternative
Policy M-1.5: Flexible LOS Standards	Consistent. The project would promote an increase in biking and walking by adding a Class I shared pedestrian and bicycle path along the north and south sides of Whipple Road.	Consistent. The No-Build Alternative would not require consideration of LOS standards.
Policy M-2.1: Regional Plans	Consistent. The project is proposed by Caltrans, in cooperation with Alameda CTC and the cities of Hayward and Union City. Proposed improvements to the regional transportation network are the result of coordination among the aforementioned agencies to meet the needs identified in the region.	Consistent. The No-Build Alternative would not require any additional coordination with regional agencies such as Caltrans, Alameda CTC, or MTC.
Policy M-2.3: Multi-Jurisdictional Transportation Corridors	Consistent. Implementation of the project would realign, restripe, and add bicycle and pedestrian improvements to local roadways, thus improving overall mobility in the area. In addition, modifications to the I-880 corridor would alleviate traffic congestion on local roadways including but not limited to Alvarado-Niles Road, Industrial Parkway, and Union City Boulevard.	Consistent. Under the No-Build Alternative, Hayward would continue to work with regional agencies on transportation planning in the City.

CHAPTER 2.1 AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES,
AND AVOIDANCE MINIMIZATION AND/OR MITIGATION MEASURES

General Plan Policy	Build Alternatives	No-Build Alternative
Policy M-3.1: Serving All Users	Consistent. The project would provide safe, comfortable, and convenient travel to serve all users including pedestrians, bicyclists and motorists by adding safe paths and roads to the Industrial Technology and Innovation (ITI) Corridor.	Not Consistent. Under the No-Build Alternative, the two interchanges would not provide safe, comfortable and convenient travel to all users.
Union City General Plan Consistency		
Policy LU-D.6.1	Consistent. The highway improvements would not displace residences or businesses or otherwise adversely affect neighborhoods. The project would not alter access between communities or neighborhoods.	Not Consistent. Under the No-Build Alternative, the City would not fulfill the requirements of improving streets and roads around Union Landing.
Policy TR-A.1.2	Consistent. The project would improve traffic flow and capacity by widening and altering existing lane configurations.	Not Consistent. Under the No-Build Alternative, traffic flow problems at the two interchanges would not be addressed.
Policy TR-A.1.13	Consistent. Direct access points to Whipple Road would not be impacted, in order to maintain traffic flow.	Consistent. Under the No-Build Alternative, direct access points to Whipple Road would remain unchanged.
Policy TR-A.1.16	Consistent. Union City is working with Hayward to enhance the capacity of Whipple Road through this project.	Consistent. Under the No-Build Alternative, no changes to Whipple Road would occur.

Source: City of Hayward, 2014; City of Union City, 2012; Circlepoint, 2019

EXISTING AND FUTURE LAND USE

Existing Land Uses and Zoning

The land use study area surrounding the I-880/Industrial Parkway West Interchange consists of flat terrain developed with urban, industrial, and commercial land uses interspersed with residential neighborhoods. As depicted in Figure 2.1-1, land use designations within 1.5 miles of the I-880/Industrial Parkway West Interchange consist of the ITI corridor, a range of suburban to medium density residential, parks and recreation, retail and office commercial, and low density residential.

Land uses adjacent to the project site consist of an automobile auction venue, commercial office, a freight hub, industrial warehouses, and low-to-medium density residential communities. A single-family residential neighborhood is located about 350 feet north of the I-880/Industrial Parkway West Interchange.

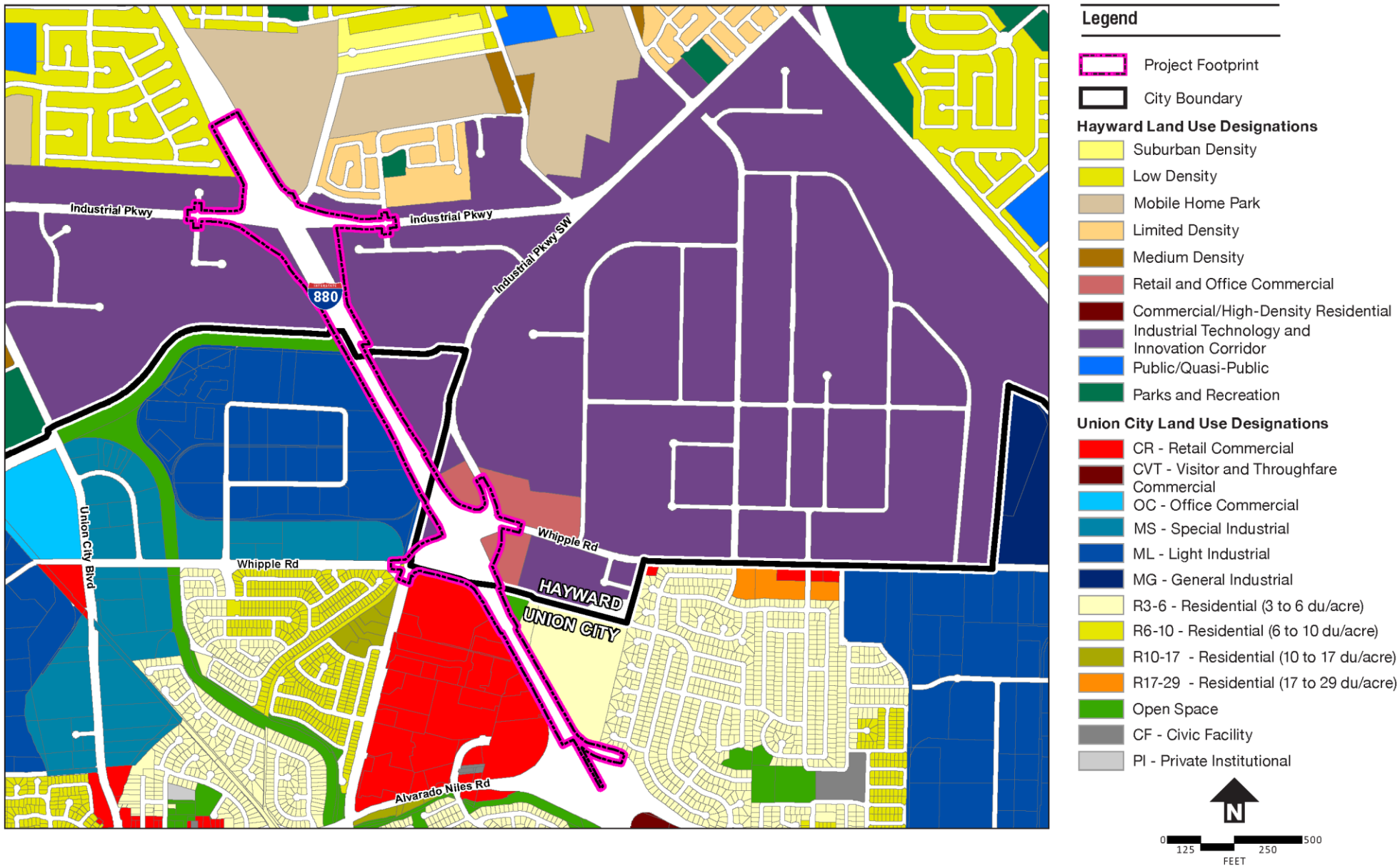
Farther south, the land use study area surrounding the I-880/Whipple Road-Industrial Parkway Southwest Interchange consists of commercial centers, hotels, storage facilities, and a mobile home park. A residential neighborhood is located adjacent to I-880 and 0.26 mile south of the I-880/Whipple Road-Industrial Parkway Southwest Interchange.

Surrounding land uses east of I-880 at the I-880/Whipple Road-Industrial Parkway Southwest Interchange include open space, suburban/low density residential, and civic facility. West of I-880, land use designations include retail commercial, special industrial, light industrial, office commercial, and open space. Residential neighborhoods are present west of I-880 and include suburban/low density housing. There are no farmlands present in the area. The only designated open space area in the study area is Ward Creek, immediately adjacent to the project footprint.

Planned Developments

According to the Hayward General Plan, land use goals include planned development and growth of the ITI Corridor, which is a crescent-shaped corridor located along the western and southwestern edge of the Hayward's Urban Limit Line. Due to its centralized Bay Area location, freeway access, and relatively low land costs, the ITI Corridor has already attracted a variety of warehousing and distribution facilities, food manufacturing companies, bio-technology firms, and informational technology businesses. Hayward's goal is to maintain and improve the ITI Corridor and expand the economic and employment base of the City. The project is located within the ITI Corridor and would provide improvements to freeway access that are necessary to support ITI Corridor goals.

A majority of Union City's Planning Area is currently built out including areas in and around the project study area. The western boundary of the city, and outside the project study area, is marked by sensitive bay lands and is undevelopable. As described in the City's draft General Plan update, development of the few remaining vacant sites and the redevelopment of underutilized sites are the only options to accommodate future growth. There are no recent or planned developments in Union City within the study area.



Hayward and Union City Land Use Maps

Figure **2.1-1**

Source: Circlepoint; City of Hayward, 2013, City of Union City, 2002.

ENVIRONMENTAL CONSEQUENCES

Build Alternatives

The project includes three Build Alternatives at the I-880 Industrial Parkway West interchange and one design variation at the I-880 Whipple Road-Industrial Parkway Southwest interchange. All Build Alternatives would alleviate congestion, increase multi-modal access, and support implementation of local and regional land use and transportation plans. While each Build Alternative has unique technical characteristics relating to on- and off-ramp configurations, the footprint of each Build Alternative is similar and therefore the effect of each as it relates to land use consistency would be similar. The following analysis is relevant for all Build Alternatives unless specified otherwise.

During construction, construction activities and construction staging areas may cause traffic inconveniences for local roadway users and surrounding businesses. Temporary intersection closures may be required during construction, and detour routes would be provided within each jurisdiction. Given that closures would be temporary and detour routes would be provided, construction of any of the Build Alternatives would not result in an adverse effect related to land use.

The Hayward and Union City General Plans identify the I-880 Industrial Parkway West Interchange and the I-880 Whipple Road-Industrial Parkway Southwest interchanges as areas that could benefit from improved circulation and enhanced mobility. MTC, as the regional transportation planning agency in the San Francisco Bay Area, has also included the project in the RTP. Therefore, the project changes are accounted for in both local General Plans and overarching, regional plans. The Build Alternatives would not require or result in changes in existing land use in the surrounding area. Some property acquisition would be required for the Build Alternatives, which is described in Section 2.1.3, Community Impacts. Based on the above, none of the Build Alternatives would result in an adverse effects related to existing or future land use.

No-Build Alternative

Under the No-Build Alternative, no changes would be made to the intersections within the study area. The No-Build Alternative would not conflict with existing or proposed land uses. The No-Build Alternative would have no effect on land use.

Cumulative Impacts

Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of the proposed project. A cumulative

effect assessment looks at the collective impacts posed by individual land use plans and projects. Cumulative impacts can result from individually minor but collectively substantial impacts taking place over time.

Cumulative impacts to resources in the project area may result from residential, commercial, industrial, and highway development. These land use activities can degrade habitat and species diversity, water quality, and other natural resources within a region. They can also contribute to potential community impacts identified for the project, such as changes in community character, traffic patterns, housing availability, and employment.

CEQA Guidelines Section 15130 describes when a cumulative impact analysis is necessary and what elements are necessary for an adequate discussion of cumulative impacts. The definition of cumulative impacts under CEQA can be found in Section 15355 of the CEQA Guidelines. A definition of cumulative impacts under NEPA can be found in 40 Code of Federal Regulations (CFR) Section 1508.7.

Past and future developments within Hayward and Union City consists of mostly commercial and residential projects. As discussed above, development of the study area has been discussed in applicable plans and regulatory documents locally and within the region. All of the Build Alternatives would be consistent with applicable land use goals, policies, and objectives of each jurisdiction's General Plan, as demonstrated in Table 2.1.1-1.

Given the Build Alternatives would be consistent with the General Plans and Plan Bay Area (2040), as well as reasonable assumption for other projects in the cumulative impacts scenario to be generally consistent with the land use policy framework, cumulative impacts to land use would not occur.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

The Build Alternatives are consistent with local land use and planning goals and policies to improve traffic circulation and improve safety on the local roadway network and at the existing interchanges. Therefore, no avoidance, minimization, or mitigation measures are required.

2.1.2 PARKS AND RECREATIONAL FACILITIES

This section describes the project's effect on parks and recreation. Sources of information used to prepare the analysis in this section include:

- City of Hayward General Plan (2014)
- City of Union City General Plan (2012)
- CIA prepared for the project

There are six parks and recreational resources protected under the provisions of Section 4(f) of the Department of Transportation Act, however, no use of these resources would occur. See Appendix D for further discussion of Section 4(f) resources.

REGULATORY SETTING

Federal

There are no applicable federal regulations.

See Appendix D for discussion of parks and recreational resources protected under the provisions of Section 4(f) of the Department of Transportation Act.

State

Park Preservation Act

The Park Preservation Act prohibits local and state agencies from acquiring any property which is in use as a public park at the time of acquisition unless the acquiring agency pays sufficient compensation or land, or both, to enable the operator of the park to replace the park land and any park facilities on that land.

CONSISTENCY WITH PLANS, POLICIES AND PROGRAMS

Local Regulations

City of Hayward

The City of Hayward's General Plan is the comprehensive planning document which governs development within the City. The following policy is relevant to the project:

Policy HQL-11.1 The City shall establish and maintain an integrated recreational corridor system that connects regional trails (e.g., Bay Trail, The San Francisco Bay Area Water Trail, San Lorenzo Creek Trail, Ridge Trail, the Juan Bautista DeAnza National Historic Trail), Baylands (i.e.,

Hayward Regional Shoreline), local creeks and open space corridors, hillside areas, and EBRPD (East Bay Regional Park District) and HARD (Hayward Area Recreation and Parks District) parks.

Union City

Union City’s General Plan is the comprehensive planning document which governs development within the City. The following policy is relevant to the project:

Policy TR-C.2.3 The City shall integrate, wherever possible, its planned bicycle route network with the Alameda Countywide Bicycle network and existing bicycle facilities in Fremont and Hayward.

Table 2.1.2-1 summarizes the project’s consistency with relevant local plans and programs.

Table 2.1.2-1 Consistency with State, Regional, and Local Plans and Programs

General Plan Policy		
Policy HQL-11.1: Recreational Corridors	Consistent. The project would enhance the recreational corridor system that connects regional trails by adding a Class I bike path through the ITI Corridor.	Consistent. Under the No-Build Alternative, the City would not impact the integrated recreational corridor system that connects regional trails.
Policy TR-C.2.3	Consistent. This project would support implementation of the City’s planned bicycle route network and existing bicycle facilities.	Not Consistent. Under the No-Build Alternative, the City would not integrate its planned bicycle route network wherever possible.

Source: City of Hayward 2014; City of Union City 2012; Circlepoint 2019

AFFECTED ENVIRONMENT

Public Parks

Hayward and Union City have an extensive park system offering a diverse range of outdoor facilities to meet the needs of the communities. Table 2.1.2-2 lists the six public parks and recreational facilities located within 0.5 mile of the project limits: Ward Creek Bike Path, Stratford Village Park, Ruus Park, Casa Verde Park, Town Estates Park, and San Andreas Park. Three parks and recreational resources are located in proximity to the I-880 Industrial Parkway West Interchange, and three are located in the proximity to the I-880/Whipple Road-Industrial Parkway Southwest Interchange. All resources mentioned below are located within the cities of Hayward and Union City. These parks and recreational resources are protected under the provisions of Section 4(f) of the Department of Transportation Act (see Appendix D), with the exception of Ward Creek Bike Path.⁸

Table 2.1.2-2 Parks and Recreational Facilities

Name	Size	Status	Distance from Project Limits (within .5 mile)	Jurisdiction
Ward Creek Bike Path ¹	N/A	Built	Path runs directly under project	Hayward
Stratford Village Park	2.40 acres	Built	0.25 mile east	Hayward
Ruus Park	10.35 acres	Built	0.23 mile northeast	Hayward
Casa Verde Park	11.40 acres	Built	0.44 mile southwest	Union City
Town Estates Park	10.85 acres	Built	0.46 mile southeast	Union City
San Andreas Park	3.96 acres	Built	0.41 mile southwest	Union City

Source: Circlepoint, 2019

¹ The Ward Creek Bike Path is not accessible to the public under existing conditions.

⁸ As detailed in FHWA’s Section 4(f) Policy Paper, a resource is protected under Section 4(f) if its primary intended purpose is recreational and its current use is consistent with the primary purpose.

Trails and Bikeways

The existing bike and trail system in Union City and Hayward consist of both on- and off-street facilities. Off-street bike paths include the Alameda Creek Regional Trail, Alameda Creek Trail, Dry Creek Trail, Mariner Park Trail, William Cann Civic Center Park Trail, and the Bay Trail. These trails are protected under the provisions of Section 4(f) because they are publicly owned and designated or functioning primarily for recreational purposes (Appendix D). However, only the Alameda Creek Trail is located within 1 mile of the project, south of the project site. The Ward Creek Bike Path runs directly under the project site. This resource is publicly owned, but has not been designated as a recreational resource by the official with jurisdiction (Hayward). Under existing conditions, the bike path is closed to users in the project area.

The primary function of the Ward Creek Bike Path is as a transportation facility, not a recreational amenity. On-street bike paths are discussed in Section 2.1.5, Traffic and Transportation/Pedestrian and Bicycles Facilities, as existing bike lanes are generally used for transportation purposes (traveling from Point A to Point B) and are not considered recreational resources.

ENVIRONMENTAL CONSEQUENCES

Build Alternatives

While each Build Alternative has unique technical characteristics relating to on- and off-ramp configurations, the footprint of each Build Alternative is similar and therefore the effect of each as it relates to effects on parks and recreational facilities would be similar. The following analysis is relevant for all Build Alternatives unless specified otherwise.

Construction

Construction work would not occur within nearby parks identified in Table 2.1.2-2, with the exception of Ward Creek Bike Path. The Ward Creek Bike Path runs directly under the project site, however it is not accessible to the public under existing conditions. Ward Creek would be realigned on the southeast side of the I-880/Industrial Parkway West Interchange. Therefore, Ward Creek and the Ward Creek Bike Path would not be open to the public during construction activities. Approximately 1,000 linear feet of the channel would be realigned 75 feet east to accommodate the new northbound I-880 off-ramp to Industrial Parkway West.

Potential increases in ambient noise levels during construction would not result in noise impacts in the areas where parks and recreational facilities are located, because of the relative distance between the project site and nearby parks (more than 1,000 feet).

Therefore, construction of the Build Alternatives would not result in an adverse effect related to parks and recreation resources.

Operation

None of the Build Alternatives would require permanent acquisition of parks or recreational facilities. Therefore, none of the Build Alternatives would result in direct effects to parks or recreation resources.

Once operational, the Build Alternatives would not result in altered access to parks or recreational facilities or increases in ambient noise levels. All three of the Build Alternatives would include construction of two Class I shared pedestrian and bicycle paths along the north and south side of Whipple Road, between Dyer Street and Industrial Parkway Southwest. This would improve bicycle and pedestrian facilities across the interchange along Whipple Road. Proposed improvements to the local and regional bicycle and pedestrian network are consistent with local and regional plans.

After construction, the Ward Creek Bike Path would function the same as it did prior to construction. Access points would not change, and the path would continue to be available to serve bicyclists should the City open it to the public in the future. The realigned portion of the path would be identical to existing portions of the path in regard to width, amenities, and materials.

The Build Alternatives would support identified growth projections provided in the Hayward General Plan. As a roadway project, the Build Alternatives would not have growth-inducing effects that would increase demands for parks or recreational facilities. Therefore, operation of the Build Alternatives would not result in adverse effects to parks or recreation resources.

No-Build Alternative

Under the No-Build Alternative, none of the project features described under the Build Alternatives would be constructed. The existing transportation facilities within the project limits would remain unchanged except for the planned and programmed improvements to convert the northbound and southbound high occupancy vehicles (HOV) lanes to express lanes. No other projects are planned within the project limits. The No-Build Alternative would not result in an adverse effect to parks or recreation resources.

Cumulative Impacts

The Build Alternatives would not affect parks or recreational resources and no Section 4(f) use would occur. As stated above, the project is consistent with the General Plans and Plan Bay Area (2040), including provisions to enhance existing and planned bicycle network

facilities. Given this, the project would therefore not contribute to any potential cumulative effects to these resources.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

While construction of all Build Alternatives would require a temporary restriction of public access to Ward Creek and the Ward Creek Bike Path, access to this path is not currently available to members of the public. None of the Build Alternatives would result in adverse effects to parks and recreational facilities. Therefore, no avoidance, minimization, or mitigation measures would be required. There would be no adverse effects to parks or recreational facilities as a result of the project.

2.1.3 COMMUNITY IMPACTS

The community impacts section is divided into three subsections; Community Character and Cohesion, Relocations, and Environmental Justice. This section describes the project's potential effects on the local community. Sources of information used to prepare the analysis in this section include:

- City of Hayward General Plan (2014)
- City of Union City General Plan (2002)
- CIA prepared for the project

COMMUNITY CHARACTER AND COHESION

Regulatory Setting

Federal

NEPA of 1969, as amended, established that the federal government use all practicable means to ensure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings (42 United States Code [USC] 4331[b][2]). The FHWA in its implementation of NEPA (23 USC 109[h]) directs that final decisions on projects are to be made in the best overall public interest. This requires taking into account adverse environmental impacts, such as destruction or disruption of human-made resources, community cohesion, and the availability of public facilities and services.

State

Under CEQA, an economic or social change by itself is not to be considered a significant effect on the environment. However, if a social or economic change is related to a physical change, then social or economic change may be considered in determining whether the physical change is significant. Since this project would result in physical change to the environment, it is appropriate to consider changes to community character and cohesion in assessing the significance of the project's effects.

Local Regulations

The Land Use and Community Character Element of the Hayward General Plan establishes goals and policies to strategically accommodate future growth and change while preserving and enhancing the qualities and characteristics of Hayward. The goals and policies are designed to enhance Hayward's neighborhoods and districts with an attractive mix of uses and amenities that expand the local economy, enhance social interaction, protect environmental resources, and improve the overall quality of life of residents. A variety of topics are discussed within the Community Character Element, including an initiative to enhance the ITI Corridor. Goals for the ITI corridor include improving streetscapes with landscaped medians, and widened sidewalks that are improved with street trees, pedestrian scaled lighting, underground utilities, landscaping, and streetscape furniture and amenities. The Community Character Element also mentions the local policy to provide pedestrian walkways to connect building entrances to sidewalks and to use landscaped buffers with trees and attractive sound walls to screen adjacent residential areas and other sensitive uses. The City shall also strive to beautify Mission Boulevard and Whipple Road.

The Community Design Element of the Union City's General Plan also seeks to strengthen Union City's identity by improving the quality of places and images throughout the city. The Community Design Element outlines specific goals and policies intended to strengthen Union City's community character.

Affected Environment

Information in this section is based on the CIA prepared for the project. The CIA considered and analyzed impacts to the communities within Hayward and Union City. As described in the CIA, the study area for addressing indirect effects such as community character and population and housing, a 0.5-mile buffer was established around the project site. For indirect effects that could encompass larger areas, such as economic conditions, entire jurisdictions are evaluated (Hayward, Union City, and Alameda County). The 0.5-mile study area primarily consists of flat terrain with built up urban, industrial, and commercial land uses interspersed with residential pockets.

Land Use

Land uses adjacent to the I-880/Industrial Parkway West interchange consist of an automobile auction venue, commercial offices, a freight hub, industrial warehouses, and low to limited medium density residential communities. The largest business in the study area is an automobile auction venue and associated parking lot, located immediately adjacent to the east of the I-880/Industrial Parkway West interchange.

Additionally, a truck freight hub is located adjacent to I-880 along the western portion of the project and southbound I-880. A single-family residential neighborhood is located 350 feet north of the interchange. The surrounding land uses of the I-880/Whipple Road-Industrial Parkway Southwest interchange consist of commercial centers, hotels, storage facilities, and a mobile home community. The west side of the interchange includes commercial shopping centers and a storage facility. A residential neighborhood is located adjacent to I-880 and 0.26 mile south of the I-880/Whipple Road-Industrial Parkway Southwest interchange.

Neighborhoods/Communities/Community Character

The values and issues that are important to a community set the character and baseline context for how the project would fit into the community's ideologies. The community character of each city is described below, including key community and activity centers.

Hayward

The City of Hayward's vision for the community is to make Hayward an exceptional place to live, work, and play. Hayward works to provide clean, safe, and green neighborhoods for a diverse population. One of Hayward's guiding principles is to create a business-friendly community that has a robust and diversified economy based in innovation, creativity, and local entrepreneurship. Hayward has many assets that can help the City develop a robust and diversified economy, including the ITI Corridor, Hayward Executive Airport, Downtown Hayward, Chabot College, and California State University, East Bay. Hayward also has excellent access to regional transportation routes, including freeways, freight rail, Amtrak, and BART. Another guiding principle is to provide a safe, walkable, vibrant, and prosperous Downtown that serves as an attractive area for business and a destination for shopping and dining, arts and entertainment, and college-town culture. In doing so, Hayward promotes locations and events on the City website, allowing residents of all ages and backgrounds to discover everything Hayward has to offer. From special seasonal/themed events to community volunteer opportunities, Hayward encourages residents to create a prosperous Downtown.

The Hayward Area Recreation & Park District (H.A.R.D.) is an independent special use the district created to provide park and recreation services for over 280,000 residents. H.A.R.D. provides recreational and enrichment programs for members of the community through many of their facilities throughout Hayward. H.A.R.D. also includes a Senior/Active Adults program to engage members of the community 50+ years or older in a variety of programs and special events. Some H.A.R.D. facilities closest to the project site include Stratford Village Park, located at Stratford Road and Canterbury Lane approximately 0.25-mile east of the I-880/Industrial Parkway West interchange, Ruus Park, located at Dickens and Folsom approximately 0.23-mile northeast of the I-880/Industrial Parkway West

interchange, and Matt Jimenez Community Center, located at 28200 Ruus Road approximately 0.9-mile north of the I-880/Industrial Parkway West interchange.

Union City

Union City has three main goals to achieve their long-term vision for the physical, economic, and social evolution of Union City: create a prosperous and compassionate city, “making places” in Union City, and improving services and support for a quality future. Union City places a high priority on programs and facilities that serve youth, families, and seniors. Union City's award-winning Community and Recreation Services department provides recreation and leisure services to the entire community. The closest facilities to the project site include the Holly Community Center at 31600 Alvarado Blvd, 0.9 mile southwest of the Whipple Road-Industrial Parkway Southwest Interchange, and the Mark Green Sports Center. The Mark Green Sports Center, located on Union City Boulevard, is a state-of-the-art fitness center and is located approximately 1 mile southwest of the Whipple Road-Industrial Parkway Southwest Interchange. Union City also offers a variety of volunteer and engagement events for the community to create a better city.

Population and Housing

The following population data was compiled from the 2016 American Communities Survey (ACS), which is the most recent U.S. Census data after the U.S. Census in 2010.

Alameda County is part of the nine counties that make up the San Francisco Bay Area, is the second most populous county in the region, and the seventh most populous county in the state. As described in Table 2.1.3-1 below, the County has a population of approximately 1.6 million people. According to the ABAG data package, the County saw an increase of 3.6 percent in employed residents between 2000 and 2011, increasing to 718,035 employed residents ages 16 and over.

The current population in Hayward is 154,507 people and Union City's population is 73,500 people. As shown in Table 2.1.3-1, Hayward experienced a 7 percent increase in population between 2010 and 2016, a slightly larger population increase in comparison to the County and Union City. Between 2010 and 2016, the number of households increased by 3 percent in Hayward and 1.3 percent in Union City.

Table 2.1.3-1 2010-2016 Population and Household Growth

Geographic Area	Population			Households		
	2010 ¹ (No. people)	2016 ² (No. people)	Percent Change (%)	2010 ¹ (No. units)	2016 ² (No. units)	Percent Change (%)
Alameda County	1,510,271	1,605,217	+6%	545,138	564,293	+29%
Hayward	144,186	154,507	+7%	45,365	46,672	+3%
Union City	69,516	73,500	+6%	20,433	20,698	+1.3%

Source:

¹U.S. Census, 2010

²ACS, 2016

Table 2.1.3-2 illustrates ABAG’s projections on population growth for the regional study area by 2040. Using 2016 ACS data, the County is expected increase in population by 24 percent, and Hayward by 21 percent. Union City is expected to increase by 12 percent.

Table 2.1.3-2 Projected Population and Household Growth (2040)

Geographic Area	Population			Households		
	2010 ¹ (No. people)	2016 ² (No. people)	Projected Change by 2040 (%)	2010 ¹ (No. units)	2016 ² (No. units)	Projected Change by 2040 (%)
Alameda County	1,605,217	1,987,900	+24%	564,293	705,330	+25%
Hayward	154,507	188,000	+21%	46,672	58,850	+26%
Union City	73,500	82,500	+12%	20,698	23,650	+14%

Source:

¹ACS, 2016

²ABAG, 2013

Age

The median age for Hayward and Union City is 34 and 38 years, respectively. In 2016, residents 65 years and older comprised 11 to 14 percent of the population in both cities (see Table 2.1.3-3).

Table 2.1.3-3 Population 65 years and Over

Geographic Area	Population	
	2010 ¹	2016 ²
Alameda County	11%	12%
Hayward	10.2%	11.2%
Union City	11.1%	14.4%

Source:

¹U.S. Census 2010

²ACS, 2016

Income and Employment

As shown in Table 2.1.3-4, Hayward and Union City share a similar employment market mix, with approximately 20 percent or more of employment found in the educational services, health care, and social assistance sectors. Approximately 12 to 15 percent of the workforce is in professional scientific and managements services, and 10 to 11 percent is in the manufacturing industry. The smallest employment sector for the two cities is in agriculture, forestry, fishing and hunting, and mining industries, which is concurrent with the County's number of employees in that sector. Within the study area, 5 percent of the population is below poverty level, with the median household income being \$82,758 (ACS, 2016). The income levels of the County, Hayward, Union City, and the study area are shown below in Table 2.1.3-11 as a part of the Environmental Justice discussion.

Table 2.1.3-4 Employment Sector

Sector	Alameda County		Hayward		Union City	
	Persons	Percent	Persons	Percent	Persons	Percent
Educational services, and health care and social assistance	177,195	22.1%	15,137	20%	7,750	21.2%
Professional, scientific, and management, and administrative and waste management services	144,378	18%	9,286	12.3%	5,551	15.6%
Manufacturing	80,525	10.1%	8,451	11.2%	5,429	15.2%
Retail Trade	75,635	9.4%	8,099	10.7%	3,988	11.2%

Sector	Alameda County		Hayward		Union City	
	Persons	Percent	Persons	Percent	Persons	Percent
Arts, entertainment, and recreation, and accommodation and food services	71,705	9%	7,705	10.2%	2,593	7.3%
Agriculture, forestry, fishing and hunting, and mining	3,256	0.4%	303	0.4%	56	0.2%

Source: ACS, 2016

Housing

According to the Hayward General Plan, residential land use is categorized as follows:

- High Density – (17.4 to 34.8 dwelling unit(du)/acre)
- Medium Density – (8.7 to 17.4 du/acre)
- Limited Medium Density – (8.7 to 12.0 du/acre)
- Mobile Home Park – (8.7 to 12.0 du/acre)
- Low Density – (4.3 to 8.7 du/acre)
- Suburban Density – (1.0 to 4.3 du/acre)
- Rural Estate Density – (0.2 to 1.0 du/acre)

The Hayward General Plan describes a mix of limited medium density, suburban density, low density, and a mobile home park within the vicinity of the study area. Hayward’s residential communities are located through the central, northern, and eastern portions of the city.

The Union City General Plan reports the City has a high percentage of single-family units when compared to the County as a whole. As of 2014, Union City’s housing stock consisted of 76.9 percent single-family units, 18.4 percent multi-family units, and 4.7 percent mobile homes. In the study area, the Union City General Plan designates residential developments according to levels of density, as listed below.

Union City’s residential land use is categorized as the following:

- R29-60 Residential (29-60 du/acre)
- R17-29 Residential (17 to 29 du/acre)
- R10-17 Residential (10 to 27 du/acre)
- R6-10 Residential (6 to 10 du/acre)
- R3-6 Residential (3 to 6 du/acre)

Low to medium density residential development (R3-6 through R6-10 Residential) is predominant near or within the eastern portion of the study area. High to very high residential (R10-R17 through R29-60 Residential) can be found west of I-880 and the study area.

Homeownership Market

As of 2018, Hayward's median home prices are below the countywide median price of approximately \$879,000. Hayward's median asking price is around \$669,000 or 4 percent below the County's. According to the housing real estate website, Zillow, home values in Hayward went up 11.9 percent through 2018 and were predicted to increase up to 12.2 percent through 2019.

Union City's median asking price is approximately \$930,000 and around 6 percent higher than the countywide median price. Home values in Union City went up 14.4 percent over the past year and were predicted to increase 10.6 percent within the next year.

Housing Vacancy and Demand

A certain number of units are needed to moderate the cost of housing, allowing sufficient choice for residents. Vacancy rates of approximately 2 percent for ownership housing and 5 to 6 percent for rental housing are generally considered optimal by housing professionals to balance demand supply for housing. According to the 2016 ACS, the County's homeowner vacancy rate was nearly 1 percent and rental vacancy rate was 2.8 percent. Both homeowner and rental vacancy rates were below the optimal average vacancy rates. Hayward's homeowner vacancy rate was 0.6 percent and rental vacancy rate was 2.5 percent. Hayward's vacancy rates are considered very optimal for standard vacancy rates. Union City's homeowner vacancy rate was 1 percent and rental vacancy rate was 4.2 percent. Coinciding with the surrounding area, Union City's vacancy rates are also considered very optimal for standard vacancy rates.

In addition to optimal vacancy rates, state law requires all regional council of governments to determine the existing and projected housing need for their region and to allocate a portion of the regional housing need to each jurisdiction. The following table reflects ABAG's regional housing allocation for Hayward, Union City, and the County.

Table 2.1.3-5 Regional Housing Need Allocation by Income Group, 2015-2023

Income Group	Percent of Area Media Income	Alameda County	Hayward	Union City
Very Low	0-50%	9,912	851	317
Low	51-80%	6,604	480	180
Moderate	81-120%	7,924	608	192
Above Moderate	120%+	19,956	1,981	417
Total	N/A	44,396	3,920	1,106

Source: ABAG, 2013

Based on ABAG’s allocations in Table 2.1.3-5, Hayward should plan for 3,920 new housing units and Union City 1,106 new housing units between January 31, 2015 and January 31, 2023. The estimates for very low-income housing need in Hayward and Union City are 851 and 317 housing units, respectively. Based on the California Housing and Community Development (HCD) standards, 50 percent of very low-income housing should be planned for extremely low-income households. Therefore, there is a projected need for additional units in the extremely low-income household category.

Environmental Consequences

Build Alternatives

While each Build Alternative has unique technical characteristics relating to on- and off-ramp configurations, the footprint of each Build Alternative is similar and therefore the effect of each as it relates to community impacts would be similar. The following analysis is relevant for all Build Alternatives unless specified otherwise.

Regional Population Characteristics

Based on the census criteria for low income populations, described further under Environmental Justice, the 0.5-mile study area does not contain a low-income environmental justice community. However, the study area does include 83 percent minority populations, which would define the study area as an environmental justice community. See the Environmental Justice section (2.1.3) for more detailed information on project effects to minority populations.

Neighborhoods/Community/Community Character and Population

Construction

During construction, temporary roadway closures might inconvenience community members for a short period of time but would not affect general travel routines. None of the Build Alternatives would displace residences or otherwise divide an existing neighborhood. Construction activities would not occur in proximity to any community centers, parks, or recreational areas where community members usually congregate for festivals, farmer's markets, or other community events. For these reasons, construction of the Build Alternatives would not negatively affect community cohesion.

Operation

Regional growth and local development have resulted in significant traffic increases on I-880 and the local streets serving both interchanges. The current interchange configurations create long traffic queues of vehicles waiting to enter or exit the freeway. Congestion and delays in the study area also adversely affect efficient goods movement to and from the Hayward ITI Corridor. The purpose of the project is to improve traffic operations and safety at the I-880/Whipple Road-Industrial Parkway Southwest and I-880/Industrial Parkway West interchanges, and to provide safe bicycle and pedestrian connections across the I-880 corridor.

The proposed improvements would enhance access and connectivity of the community, helping to support residents' ability to access and participate in community events. The project would allow drivers to travel effectively through the ITI Corridor, improving a vital connection to businesses in the project area. The project would also alleviate traffic-related impacts to the local street network, diverting traffic to roadways better equipped to handle the volume of drivers present in the project area each day.

Further, there are currently no striped bike lanes along either Whipple Road or Industrial Parkway West where the roadways cross I-880, and both interchanges include high-speed, free-flowing ramps that present safety concerns for pedestrians and bicyclists. These interchanges were identified by Hayward and Union City as corridors in need of enhanced bicycle and pedestrian improvements. The project would provide such improvements in the multi-modal connectivity between the east and west sides of I-880.

The project would not result in changes to the area's population, as it would not introduce new housing or new uses that could attract substantial numbers of new residents to the area, such as a major employment center. The project would not change community focal points or introduce a new focal point but would rather provide bike and pedestrian connections along I-880 and the Whipple Road-Industrial Parkway Southwest and Industrial Parkway West interchanges. All roadway and associated improvements are planned for existing infrastructure: the I-880 freeway, Whipple Road, and Industrial

Parkway West; therefore, no new physical or perceptual barriers would be created. The changes to access in the immediate area of the project would not adversely affect the community, as the improvements would enhance circulation and access in the area.

Housing

None of the Build Alternatives would displace individuals or residents, necessitating the construction of replacement housing elsewhere. The existing residences identified in Affected Environment are outside the project footprint and would remain in place. As previously discussed, the project intends to relieve congestion and traffic delays in the study area and improve daily traffic operations. The project would improve overall safety and enhance existing commercial and residential developments.

No-Build Alternative

Under the No-Build Alternative, no improvements would occur, and the programmed and planned interchange improvements would not be met. The existing transportation facilities within the study area would remain unchanged. The No-Build Alternative would have no effect on the existing community character or cohesion, regional population characteristics, housing, or other community impacts.

Cumulative Impacts

The Build Alternatives would improve traffic circulation and mobility in a built-out urban area. Improvements to the I-880/Whipple Road-Industrial Parkway Southwest and I-880/Industrial Parkway West interchanges would not encroach on existing communities. Given the Build Alternatives would support identified growth projections with traffic improvements and would not negatively affect the cohesion of existing communities surrounding the project site, there would be no cumulative effect on community character and cohesion. The project would not result in a cumulatively considerable contribution to a significant cumulative impact related to community character and cohesion.

Avoidance, Minimization, and/or Mitigation Measures

The Build Alternatives would not result in adverse effects to community character and cohesion; no avoidance, minimization, and/or mitigation measures would be required. No construction work or staging would occur at or near any community centers, parks, or recreational areas where community members usually congregate. It is not foreseen that implementation of this transportation improvement project would result in decreased use of Hayward or Union City community facilities.

RELOCATIONS AND REAL PROPERTY ACQUISITION

Regulatory Setting

Federal

The Department's Relocation Assistance Program (RAP) is based on the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (Uniform Act), and Title 49 CFR Part 24.⁹ The purpose of the RAP is to ensure that persons displaced as a result of a transportation project are treated fairly, consistently, and equitably so that such persons will not suffer disproportionate injuries as a result of projects designed for the benefit of the public as a whole. All relocation services and benefits are administered without regard to race, color, national origin, persons with disabilities, religion, age, or sex.¹⁰

Affected Environment

I-880/Industrial Parkway West Interchange

As previously discussed under Land Use, the study area in the vicinity the I-880/Industrial Parkway West Interchange consists of a parking lot for an automobile auction venue, commercial offices, a freight hub, industrial warehouses, low- to medium-density residential neighborhoods, and Ward Creek. The largest development in the area is the automobile auction venue, located 216 feet southeast of the I-880/Industrial Parkway West intersection. A single-family residential neighborhood is located approximately 350 feet north of the project.

I-880/Whipple Road-Industrial Parkway Southwest Interchange

The areas east of the I-880/Whipple Road-Industrial Parkway Southwest interchange consist of commercial centers, hotels, and storage facilities. Similarly, the west portion of the project includes commercial shopping centers and a storage facility. A residential neighborhood is located adjacent to I-880 and 0.26 mile south of the Whipple Road-

⁹⁹⁹ Caltrans, 2019. *Relocation Assistance Program*. Available online at: <https://dot.ca.gov/programs/right-of-way/relocation-assistance-program>; last accessed: October 9, 2019

¹⁰ Caltrans, 2019. *Title VI Program, Caltrans Non-Discrimination Policy Statement*. Available online at: <https://dot.ca.gov/-/media/dot-media/programs/civil-rights/documents/title-vi/caltrans-non-discrimination-policy-statement-a11y.pdf>; last accessed: October 9, 2019

Industrial Parkway Southwest intersection. Along Whipple Road, parallel to I-880, there is a vacant triangular parcel adjacent to the off-ramp. This area is owned by the ACFCD and is not planned for improvements.

Environmental Consequences

This section analyzes the project’s potential to result in relocations and real property acquisitions in the area surrounding the I-880/Industrial Parkway West and I-880/Whipple Road-Industrial Parkway Southwest Interchanges. As previously discussed in Chapter 1.0, Proposed Project and detailed in the CIA, the Build Alternatives would require various private property acquisitions.

Build Alternative 1 would require acquisition of private property from a local business that may result in permanent relocation of that business. Build Alternative 3 would require the acquisition and displacement of a commercial building. None of the Build Alternatives would result in the displacement of any residences.

Build Alternative 1

Build Alternative 1 would require acquisitions of property from 16 parcels at the I-880/Industrial Parkway West Interchange (Table 2.1.3-6). Property acquisitions would be necessary for the northbound off-ramp, sidewalk widening along Industrial Parkway, the southbound on-ramp, and Ward Creek realignment. Permanent partial acquisitions of property from seven parcels at the I-880/Whipple Road-Industrial Parkway Southwest Interchange would also be required. These acquisitions would be necessary for the construction of bicycle lanes, sidewalk widening, the northbound diagonal on-ramp, and the northbound off-ramp.

Table 2.1.3-6 Property Acquisitions – Build Alternative 1

Number	APN	Partial (Permanent) Acquisition (square feet)	Temporary Construction Easement (square feet)	Description
I-880/Industrial Parkway West Interchange				
1	ACFCD (West)	37,871	N/A	NB Off Ramp; acquisition (area with ramp and retaining walls)
2	ACFCD (East)	1,435	N/A	SB I-880 Mainline Ward Creek Bridge Widening

CHAPTER 2.1 AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES,
AND AVOIDANCE MINIMIZATION AND/OR MITIGATION MEASURES

Number	APN	Partial (Permanent) Acquisition (square feet)	Temporary Construction Easement (square feet)	Description
3	463-25-3-14	3,708	9,332	WB Industrial Parkway sidewalk widening
4	463-25-37	928	3,628	EB Industrial Parkway sidewalk widening
5	463-25-40	78,048	14,158	SB I-880 on-ramp
6	463-25-44	N/A	3,461	SB I-880 on-ramp
7	463-25-43-1	148	2,356	SB I-880 on-ramp
8	463-45-84-2	31	7,901	SB I-880 on-ramp
9	464-120-7	4,980	14,398	NB I-880 on-ramp
10	464-121-46-2	2,188	6,866	WB Industrial Parkway sidewalk widening
11	475-177-1	15,663	3,893	Ward Creek Realignment (area with retaining walls)
12	475-177-2	2,896	2,685	Ward Creek Realignment (area with retaining walls)
13	475-177-3	N/A	3,043	EB Industrial Parkway sidewalk widening
14	475-177-14	6,099	2,007	Ward Creek Realignment (area with retaining walls)
15	475-177-15	3,883	6,859	Ward Creek Realignment (area with retaining walls)
16	475-177-16	N/A	1,266	Ward Creek Realignment (area with retaining walls)

Number	APN	Partial (Permanent) Acquisition (square feet)	Temporary Construction Easement (square feet)	Description
I-880/Whipple Road-Industrial Parkway Southwest Interchange				
17	463-60-27	N/A	905	WB Whipple Road sidewalk widening
18	475-10-17	368	3,840	SB Industrial Parkway Sidewalk widening
19	475-10-18	377	3,794	NB I-880 diagonal on-ramp
20	475-10-23	152	2,505	NB I-880 diagonal on-ramp
21	475-170-10-2	N/A	5,175	NB I-880 off-ramp
22	475-170-2-16	9,386	4,841	NB I-880 off-ramp
23	475-170-2-10	1,625	3,687	NB I-880 off-ramp

Source: Mark Thomas, 2020; Circlepoint, 2020

APN = Accessor Parcel Number; ACFCD = Alameda County Flood Control District; N/A = Not Applicable; NB = Northbound; SB = Southbound; WB = Westbound; EB = Eastbound

All property acquisitions at both interchanges would be partial acquisitions (and most are minor, affecting less than 10 percent of the parcel), in landscaped areas, paved and hardscaped areas, and surface parking lots. Most acquisitions would not result in displacement of the existing properties or businesses. At the I-880/Industrial Parkway West Interchange, two of the property acquisitions would affect existing businesses: Manheim San Francisco Bay (an auto auction company) and XPO Logistics. At the auto auction, the acquisition would affect a portion of the western edge of the parking lot to allow for the realignment of Ward Creek. This acquisition would not affect any of the auto auction structures, access to the property, and would not displace this business.¹¹

At XPO Logistics, a section of the northeast portion of the parking area would be acquired for placement of the southbound on-ramp (see Figure 1.3-3). Operations at XPO Logistics

¹¹ An April 24, 2019, meeting with business owner confirmed the acquisition would not result in relocation of the business.

include the pick-up and delivery of large amounts of freight and goods for many different businesses. The goods movement requires large trucks and freight trailers to maneuver in and around the main warehouse structure in the center of the property. Trucks are lined up at loading dock areas and loaded/unloaded before re-entering I-880. The XPO Logistics property also includes a small maintenance facility for trucks. This XPO site is utilized by the greater XPO Logistics company for extra space when other statewide locations are at capacity. Under Build Alternative 1, access to the site and existing buildings would not be altered or removed. Based on discussions with XPO Logistics, it is unclear whether this acquisition would require relocation of the business, but the business owner confirmed the acquisition would affect business operations.¹²

XPO Logistics has indicated that its visibility from the I-880 freeway is a source of new business and unsolicited requests for new contracts. Moving to a less-visible location could indirectly affect the number of new contracts (both from visibility and proximity to the freeway). It is also important to note that XPO Logistics owns an undeveloped parcel immediately south of their existing operations.

Relocation of a business such as XPO Logistics can result in loss of employment and associated financial impacts on the local economy. If the company can relocate within the same area and remain viable, the effects of unemployment would be temporary. The Caltrans CIA guidance states, "The physical removal of a city's major employer could well be a significant impact under CEQA, and it could result in multiplier effects to related businesses. The loss of a small business, however, is likely to have a lesser effect on employment in the community because of the fewer numbers of households affected." An additional consideration in evaluating the effect of business relocation is whether the business has unique citing needs (such as the co-location of data centers near subsea data cables) or relies entirely on the immediate area for business, making relocation infeasible.

Given the uncertainty concerning whether Build Alternative 1 would require relocation of XPO Logistics, it is assumed that relocation may be required. However, based on XPO Logistics' role as a smaller employer in an employment sector that makes up a small component of the local economy, this acquisition would not result in an adverse effect related to unemployment. Further, it is reasonably assumed that XPO Logistics could relocate within the study area if they desire to, based on the business type and Hayward's ongoing focus toward maintaining and expanding areas for light industrial use, or could expand operations onto their undeveloped parcel to the south. Based on the above, Build Alternative 1 would not result in an adverse effect related to relocation or real property acquisition.

¹² Based on an April 8, 2019, meeting with the business owner.

Build Alternative 2

Build Alternative 2 would require acquisition of property from 18 parcels at the I-880/Industrial Parkway West Interchange (Table 2.1.3-7). Property acquisitions would be necessary for the northbound off-ramp; southbound off-ramp, auxiliary lane, and on-ramp; sidewalk widening along Industrial Parkway; and Ward Creek realignment. Acquisitions on the east side of this interchange would be identical to Build Alternative 1. Acquisitions on the west side of the interchange would be unique to Build Alternative 2 and are described in more detail below. Property acquisitions at the I-880/Whipple Road-Industrial Parkway Southwest Interchange would be identical those discussed above for Build Alternative 1.

Table 2.1.3-7 Property Acquisitions – Build Alternative 2

Number	APN	Partial (Permanent) Acquisition (square feet)	Temporary construction easement (square feet)	Description
I-880/Industrial Parkway West Interchange				
1	ACFCD (West)	4,800	N/A	SB I-880 Ward Creek Bridge Widening
2	ACFCD (East)	37,871	N/A	NB Off Ramp; Acquisition (area with ramp and retaining walls)
3	463-45-104	22	5,579	SB I-880 Mainline (Aux Lane)
4	462-45-84-2	2,937	7,923	SB I-880 Mainline (Aux Lane)
5	463-25-3-14	8,027	9,412	WB Industrial Parkway sidewalk widening
6	463-25-37	230	3,728	EB Industrial Parkway sidewalk widening
7	463-25-40	52,556	14,038	SB I-880 on-ramp
8	463-25-43-1	5,500	2,341	SB I-880 on-ramp
9	463-25-44	6,479	3,400	SB I-880 on-ramp

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Number	APN	Partial (Permanent) Acquisition (square feet)	Temporary construction easement (square feet)	Description
10	464-0120-7	4,981	14,398	NB I-880 on-ramp
11	464-121-46-2	2,612	6,853	WB Industrial Parkway sidewalk widening
12	475-177-2	2,894	2,692	Ward Creek Realignment (area with retaining walls)
13	464-121-48-2	89	1,690	WB Industrial Parkway sidewalk widening
14	475-177-1	15,663	3,651	Ward Creek Realignment (area with retaining walls)
15	475-177-3	N/A	3,059	EB Industrial Parkway sidewalk widening
16	475-177-14	6,099	2,153	Ward Creek Realignment (area with retaining walls)
17	475-177-15	3,884	6,809	Ward Creek Realignment (area with retaining walls)
18	475-177-16	N/A	1,266	Ward Creek Realignment (area with retaining walls)
I-880/Whipple Road-Industrial Parkway Southwest Interchange				
See parcel acquisition data under Build Alternative 1.				

Source: Mark Thomas, 2020; Circlepoint, 2020

APN = Accessor Parcel Number; ACFCD = Alameda County Flood Control District;
N/A = Not Applicable; NB = Northbound; SB = Southbound; WB = Westbound;
EB = Eastbound

Under Build Alternative 2, property acquisition at XPO Logistics would be minimized. The southbound on-ramp configuration would be tightened to more closely follow the current state right of way, avoiding a diagonal acquisition through the property (see Figure 1.3-6). Based on the limited area of acquisition, it is not anticipated that Build Alternative 2 would

interfere with ongoing business operations at XPO Logistics or necessitate relocation. Therefore, Build Alternative 2 would not result in an adverse effect related to relocation or real property acquisition.

Build Alternative 3

Build Alternative 3 would require acquisition of property from 15 parcels at the I-880/Industrial Parkway West Interchange (Table 2.1.3-8). Property acquisitions would be necessary for the northbound off-ramp; southbound off-ramp and auxiliary lane sidewalk widening along Industrial Parkway; and Ward Creek realignment. Acquisitions on the east side of this interchange would be identical to Build Alternative 1. Acquisitions on the west side of the interchange would be unique to Build Alternative 3 and are described in more detail below. Property acquisitions at the I-880/Whipple Road-Industrial Parkway Southwest Interchange would be identical to those discussed above under Build Alternative 1.

Table 2.1.3-8 Property Acquisitions – Build Alternative 3

Number	APN	Partial (Permanent) Acquisition (square feet)	Temporary Construction Easement (square feet)	Description
I-880/Industrial Parkway West Interchange				
1	ACFCD	37,871	N/A	NB Off Ramp; Acquisition (area with ramp and retaining walls)
2	463-25-3-14	30,096	8,617	WB Industrial Parkway sidewalk widening
3	463-25-37	100	3,855	EB Industrial Parkway sidewalk widening
4	463-25-44	N/A	3,461	SB I-880 on-ramp
5	463-25-43-1	N/A	2,362	SB I-880 on-ramp
6	463-25-40	3,465	14,639	SB I-880 on-ramp
7	464-121-46-2	2,105	6,854	WB Industrial Parkway sidewalk widening

Number	APN	Partial (Permanent) Acquisition (square feet)	Temporary Construction Easement (square feet)	Description
8	464-121-48-2	44	1,684	WB Industrial Parkway sidewalk widening
9	464-0120-7	4,980	14,398	NB I-880 on-ramp
10	475-177-1	15,663	3,893	Ward Creek Realignment (area with retaining walls)
11	475-177-2	2,896	2,685	Ward Creek Realignment (area with retaining walls)
12	475-177-3	N/A	3,043	EB Industrial Parkway sidewalk widening
13	475-177-14	6,099	2,007	Ward Creek Realignment (area with retaining walls)
14	475-177-15	3,883	6,859	Ward Creek Realignment (area with retaining walls)
15	475-177-16	N/A	1,266	Ward Creek Realignment (area with retaining walls)
I-880/Whipple Road-Industrial Parkway Southwest Interchange				
See parcel acquisition data under Build Alternative 1.				

Source: Mark Thomas, 2020; Circlepoint, 2020

APN = Assessor Parcel Number; ACFCD = Alameda County Flood Control District;
N/A = Not Applicable; NB = Northbound; SB = Southbound; WB = Westbound;
EB = Eastbound

Build Alternative 3 would maintain the existing southbound on-ramp configuration on the northwest side of the I-880/Industrial Parkway West Interchange, and therefore would not require any property acquisition from XPO Logistics (see Figure 1.3-7). The existing southbound off-ramp at this interchange would be moved farther west and widened. This would require property acquisition from a commercial property adjacent to the I-880/Industrial Parkway West southbound off-ramp. This acquisition would impact a building that is occupied by Golden Eight Distribution, a baking supply store, and BLC

United, a foodservice container store. These businesses would be displaced and need to relocate as a result of Build Alternative 3.

As described previously, if a displaced business can relocate within the same area and remain viable, the effects of unemployment would be temporary. Further, retail trade is not a major employment sector in the study area. Based on the size of the two businesses that would need to relocate, the types of business, and Hayward's ongoing focus on supporting light industrial uses, it is reasonably assumed that both businesses could relocate within the study area. Additionally, neither business is a major employer, therefore, the effect of relocation on the local economy would not be adverse. Build Alternative 3 would not result in an adverse effect related to relocation or real property acquisition.

No-Build Alternative

Under the No-Build Alternative, no improvements would occur. The existing transportation facilities within the study area would remain unchanged. The No-Build Alternative would have no effect related to relocations or real property acquisition.

Cumulative Impacts

Acquisition needed for implementation of the Build Alternatives would not result in an adverse effect. Over time as additional highway and roadway improvement projects are implemented, additional property acquisitions may be required along the corridor. However, at the time of this Draft IS/EA, the only other planned and programmed improvements along this section of the I-880 Freeway are the conversion of existing high occupancy vehicle lanes to express lanes. The combination of these two projects would not result in a cumulative impact related to relocation or real property acquisition.

Avoidance, Minimization, and/or Mitigation Measures

Measure COM-1: Alameda CTC and Caltrans would work closely with any displaced businesses, per federal and state relocation laws and policies. All rights and services provided under Public Law 91-646, the Uniform Act of 1970, as amended, would be strictly adhered to. Relocation efforts may include the preparation of lists of properties offered for sale or rent that are suitable for a business's specific relocation needs. Payments may be made to business owners to offset relocation expenses. The types of payments available may include searching and moving expenses, reestablishment expenses, or a fixed in-lieu payment instead of moving, searching, and reestablishment expenses.

ENVIRONMENTAL JUSTICE

Regulatory Setting

All projects involving a federal action (funding, permit, or land) must comply with Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, signed by President William J. Clinton on February 11, 1994. This EO directs federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority, and low-income populations to the greatest extent practicable and permitted by law. The definition of low income is based on the Department of Health and Human Services poverty guidelines. For 2018, this was \$25,100 for a family of four.¹³

All considerations under Title VI of the Civil Rights Act of 1964 and related statutes have also been included in this project. The Department's commitment to upholding the mandates of Title VI is demonstrated by its Title VI Policy Statement, signed by the Director, which can be found in Appendix A of this document.

Affected Environment

Information in this section is based on the CIA prepared for the project. This section determines the presence of environmental justice communities to analyze whether indirect impacts borne from the project would be disproportionately felt by low income and/or minority communities. Per EO 12898, a population, as evaluated by U.S. census block groups, is subject to environmental justice analysis if it meets at least one of the following criteria:

- A low-income population that is greater than 25 percent of the total population of the community, or a minority population that is greater than 50 percent of the total population of the community
- A low-income and/or minority population that is more than 10 percentage points higher than the City or County average

¹³ U.S. Department of Health and Human Services. 2018. HHS Poverty Guidelines for 2018. Available Online: <https://aspe.hhs.gov/poverty-guidelines>. Last Accessed: June 2018

Demographic Profile

A demographic profile describes the races, ethnicities, and economic characteristics of populations existing within a study area. The study area for this environmental justice analysis is defined by census tract blocks that encompass or are within a 0.5-mile radius of the project site. Table 2.1.3-9 lists census tracts and block groups within the study area.

Data from the 2010 Census was used where applicable. Certain demographic characteristics on smaller geographic levels were not available from the 2010 Census at the time this Draft IS/EA was prepared. Therefore, characteristics of the community, including ethnicity, poverty trends, and income were primarily derived from the U.S. Census Bureau’s 2012-2016 ACS 5-year estimates. The ACS is an ongoing survey that uses a series of monthly samples to produce annually updated estimates for the same small areas formerly surveyed by the decennial census long-form sample.^{14,15} The 2016 ACS represents the most recent data available after the 2010 Census.

The U.S. Census Bureau collects race and Hispanic origin information following the guidance of the U.S. Office of Management and Budget’s (OMB) 1997 Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity. The 2013 ABAG Projections, which are used by Caltrans as the basis for regional planning activities, were used for projecting future demographic conditions.

Table 2.1.3-9 Study Area Census Tracts and Block Groups – 2016

U.S. Census Tract	U.S. Census Block Group
Census Tract 4382011, Hayward, California	Block Group 1
Census Tract 4382012, Hayward, California	Block Group 2
Census Tract 4382013, Hayward, California	Block Group 3
Census Tract 4382031, Hayward, California	Block Group 1

¹⁴ U.S. Census 2014. Methodology. Access from: <https://www.census.gov/programs-surveys/acs/methodology.html>

¹⁵ The U.S. Census measures poverty thresholds based on family income and accounting for family size, age, and composition. If a family’s income is below the poverty threshold, they are considered to be living below the poverty level (U.S. Census, *How the Census Bureau Measures Poverty*).

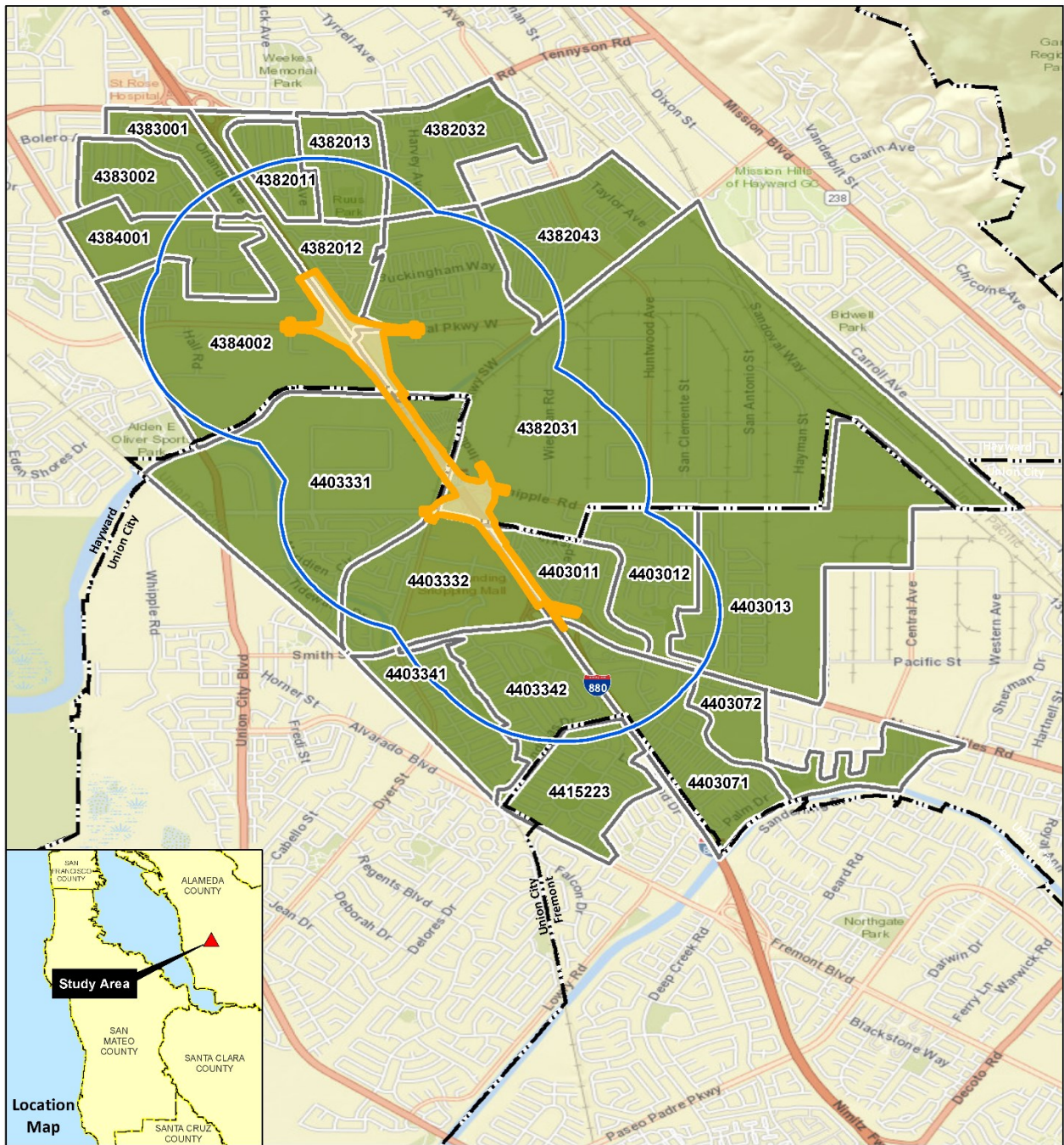
CHAPTER 2.1 AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES,
AND AVOIDANCE MINIMIZATION AND/OR MITIGATION MEASURES

U.S. Census Tract	U.S. Census Block Group
Census Tract 4382032, Hayward, California	Block Group 2
Census Tract 4382043, Hayward, California	Block Group 3
Census Tract 4383001, Hayward, California	Block Group 1
Census Tract 4383002, Hayward, California	Block Group 2
Census Tract 4384001, Hayward, California	Block Group 1
Census Tract 4384002, Hayward, California	Block Group 2
Census Tract 4403011, Union City, California	Block Group 1
Census Tract 4403012, Union City, California	Block Group 2
Census Tract 4403013, Union City, California	Block Group 3
Census Tract 4403071, Union City, California	Block Group 1
Census Tract 4403072, Union City, California	Block Group 2
Census Tract 4403331, Union City, California	Block Group 1
Census Tract 4403332, Union City, California	Block Group 2
Census Tract 4403341, Union City, California	Block Group 1
Census Tract 4403342, Union City, California	Block Group 2
Census Tract 4415223, Union City, California	Block Group 3

Source: U.S. Census, 2016

Race

Alameda County is home to a diverse population, representing many races and ethnicities. Minority groups comprise 67 percent of the County, 83 percent of Hayward, 85 percent of Union City, and 83 percent of the study area population. Figure 2.1-2 illustrates the minority populations for Alameda County, Hayward, Union City, and the 0.5-mile study area. Table 2.1.3-10 describes the population distribution in Alameda County, the city of Hayward, Union City, and the overall study area. Given the minority data, all block groups within the study area would be considered environmental justice communities based on race.

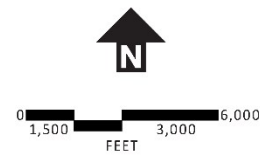


Legend

- 0.5- Mile Study Area
- Census Block Group - 2016
- Project Limits

Minority Population

- 0% - 50%
- 51% - 100%



Minority Populations Within the Study Area

Figure **2.1-2**

Source: American Community Survey, 2016

Table 2.1.3-10 Population Distribution in Alameda County

Population	Alameda County	Hayward	Union City	Study Area
Total Population	1,605,217	154,507	73,500	35,202
Hispanic or Latino (of any race)	362,070	154,507	15,782	9,453
Not Hispanic or Latino	1,243,147	62,287	57,718	25,749
White	523,797	92,220	11,161	5,963
Black or African American	176,819	26,470	3,633	2,263
American Indian and Alaska Native	4,959	16,705	240	53
Asian	449,676	456	38,337	15,441
Native Hawaiian and Other Pacific Islander	13,223	39,187	1,136	743
Some Other Race	4,524	3,467	150	11
Two or More Races	70,149	166	3,061	1,275
Minority Percent ¹	67%	83%	85%	83%

Source: ACS, 2016

¹ Minority refers to every person who is not of White Race and Non-Hispanic or Latino Ethnicity categories. The percentages were calculated by finding the numerical difference between the total population of all races and total, White, Non-Hispanic population. That number was then divided by the total population of all races.

Income

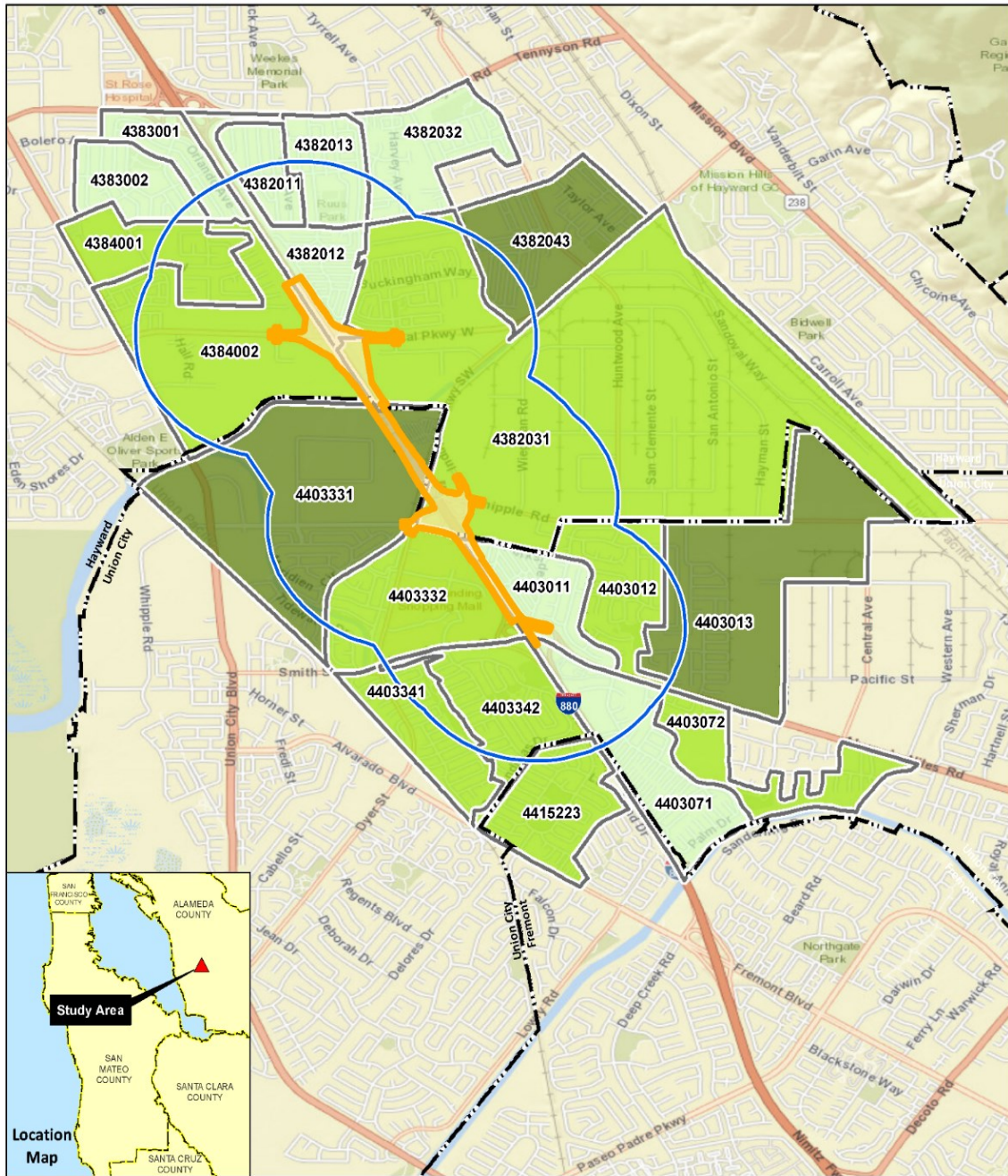
Table 2.1.3-11 summarizes 2012-2106 and 2010 ACS per capita and median household income levels for the County, Hayward, Union City, and the 0.5-mile study area. Union City has the highest median household and per capita income out of the two cities. Hayward’s median income is lower than the County overall, and Union City’s is higher. The study area’s per median household income level is slightly higher than the County overall.

None of the census block groups in the study area have a low-income population of 25 percent or higher. Within the study area, 5 percent of households are considered low-income, compared to 12 percent county-wide. Therefore, the study area does not have a concentration of low-income households greater than 10 percentage points higher than the county average. In fact, the study area has a lower percentage of low-income households than Hayward, Union City, and the County. None of the census block groups in the study area qualify as environmental justice communities based on income. Figure 2.1-3 shows the distribution of households below the poverty level in the study area.

Table 2.1.3-11 Income Levels

Area	Per Capita Income (ACS 2010)	Per Capita Income (ACS 2012-2016)	Median Household Income (Census 2010)	Median Household Income (ACS 2012-2016)	Percent Population Below Poverty Level
Alameda County	\$33,961	\$39,042	\$69,384	\$79,831	12%
City of Hayward	\$24,868	\$27,774	\$61,268	\$68,138	12.5%
City of Union City	\$29,676	\$32,515	\$83,629	\$91,629	7.9%
Study Area	\$27,549	\$28,470	\$78,376	\$82,768	5%

Source: ACS 2010, 2012-2016

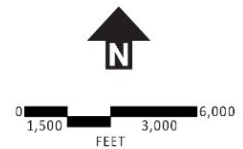


Legend

- 0.5- Mile Study Area
- Census Block Group - 2016
- Project Limits

Per Capita Income

- \$18,200 - \$25,000
- \$25,001- \$33,000
- \$33,001 - \$52,200



Per Capita Income

2.1-3

Environmental Consequences

Build Alternatives

As mentioned above, all block groups within the study area would be considered environmental justice communities based on race. The Build Alternatives would be constructed within an environmental justice community that extends well beyond the project footprint (up to 6 miles) and encompasses large swaths of residential communities in both Hayward and Union City. In looking at the regional context for community impacts, the project's purpose is to improve congestion, traffic operations, and safety at the I-880/Industrial Parkway West and I-880/Whipple Road-Industrial Parkway Southwest interchanges. This would benefit the environmental justice communities surrounding the project site, as well as the broader communities of Hayward and Union City. The Build Alternatives would enable improved access to jobs and provide better safety for multimodal transportation.

As discussed in other sections of this Draft IS/EA, the Build Alternatives would not result in adverse effects such as air quality impacts, noise impacts or displacement of residences. The following discussions summarize the few localized impacts from the Build Alternatives that may occur. However, since these impacts would not result in adverse effects, they would not disproportionately adversely affect environmental justice communities. Further, the avoidance and minimization measures identified to reduce potential effects from the Build Alternatives would be employed primarily at and near the project site. Given that the project site (and surrounding study area) is comprised of environmental justice communities, mitigation of equal quality and effectiveness would be employed in environmental justice and non-environmental justice communities. In fact, environmental justice communities would be the primary recipients of the benefits of avoidance and minimization measures.

Noise

The draft Noise Study Report (2019) and the noise analysis in this IS/EA determined that construction noise for all receptors would be short-term and intermittent and with conforming to standard Caltrans measures for noise control, the potential for construction-period noise impacts would be minimized. Under all Build Alternatives, future noise levels are anticipated to be the same as noise levels under the No-Build Alternative. Noise abatement is considered where noise impacts are predicted in areas of frequent human use that would benefit from a lowered noise level. As no traffic noise impacts are anticipated, no noise abatement measures are required.

Air Quality

Emissions of criteria pollutants and precursors from equipment and vehicle exhaust during construction would be below the Bay Area Air Quality Management District's (BAAQMD) recommended thresholds of significance for each Build Alternative. In addition, compliance with dust control measures described under the Caltrans' Special Provisions and Standard Specifications would ensure that fugitive dust emissions during construction would also meet BAAQMD's recommended thresholds of significance. Based on these thresholds, construction of the Build Alternatives would not cause, contribute to, or worsen any state air quality violations.

Because the Build Alternatives would alleviate local traffic congestion and reduce regional VMT they would not increase emissions of criteria air pollutants or mobile source air toxics (MSATs) when compared to the No-Build Alternative. In addition, emissions of criteria air pollutants and MSATs for both the Build and No-Build Alternatives would decrease in the opening year (2025) and horizon year (2045) compared to the existing year (2018), because federal and state vehicle emissions and fuel economy standards would reduce pollutant emissions over time. Therefore, the Build Alternatives would not result in an increase in emissions of criteria air pollutants or MSATs compared to the existing year conditions or the future No-Build Alternative.

Aesthetic Character

Implementation of the Build Alternatives would moderately change the visual character and reduce the visual quality of the study area. Viewers would experience an increased level of roadway dominance where new on and off ramps, replacement bridge structures, and local roadway improvements are proposed. At night, new street lighting would introduce a minor new source of glare. Together, these visual changes would be moderate. The avoidance and minimization measures listed in Section 2.1.6 would minimize these visual changes. While implementation of the Build Alternatives would result in the addition of new manmade features, the I-880 corridor would continue to be the dominant visual feature in the study area. As a result, the Build Alternatives would not substantially degrade the existing visual character or the quality of the visual impact study area.

Cumulative Impacts

The Build Alternatives are located within an environmental justice community which extends well beyond the project site. The project would reduce congestion and improve traffic operation and safety at the I-880/Industrial Parkway West and I-880/Whipple Road-Industrial Parkway Southwest interchanges, which would benefit the surrounding environmental justice communities. The project would not result in adverse effects and

would not disproportionately affect environmental justice communities. Therefore, the project would not contribute to cumulative impacts on environmental justice communities.

Avoidance, Minimization, and/or Mitigation Measures

Based on the above analysis, the Build Alternatives would not cause disproportionately high adverse effects on any minority or low-income populations in accordance with the provisions of EO 12898. No further environmental justice analysis is required.

2.1.4 UTILITIES AND EMERGENCY SERVICES

This section evaluates impacts to public utilities that may occur from implementation of the project. The study area includes the cities of Hayward and Union City, as well as utility service districts that would serve the project. Information in this section draws upon multiple sources, including:

- Hayward 2040 General Plan
- City of Union City General Plan

AFFECTED ENVIRONMENT

Hayward and Union City are served by a variety of local and regional utilities. Table 2.1.4-1 summarizes utilities that are present within the study area.

Table 2.1.4-1 Public Utility Providers Serving Hayward and Union City

Utility Type	Provider	Description
Water	Alameda County Water District	Capacity to provide 37 million gallons per day
Wastewater (Union City)	Union Sanitary District	Treats 23 million gallons of wastewater per day using 834 miles of underground pipelines throughout Fremont, Union City, and Newark
Wastewater (Hayward)	City of Hayward	The City of Hayward owns and operates the wastewater collection and treatment system that serves almost all of the residential, commercial, and industrial users within the incorporated city limits, and limited portions of the adjacent unincorporated areas of Alameda County.
Gas and Electricity	Pacific Gas and Electric (PG&E)	Provides electricity service and natural gas
Storm Water Treatment and Management	Alameda County Flood Control District	Provide stormwater treatment and management services to eliminate stormwater pollution and facilitate flood control
Communication Services	Comcast and AT&T	Cable, high-speed internet, voice

Sources: Hayward 2040 General Plan; City of Union City General Plan
Union Sanitary District, 2019. *Mission, Facts, & History*. Available online at
<https://www.unionsanitary.com/about-us/about-us/mission-facts-history>; last accessed
September 2019.

Alameda County Water District, 2019. *ACWD Fact Sheet*. Available online at
<https://www.acwd.org/93/Fact-Sheet>; last accessed September 2019.

ENVIRONMENTAL CONSEQUENCES

Build Alternatives

Construction

Under all Build Alternatives, construction activities have the potential to temporarily affect existing utilities at the project site. Demolition and excavation activities along the I-880 corridor, at interchange on- and off-ramps, bridge structures, and local roadway realignments would require the removal and replacement or relocation of existing utilities. Along I-880 and on the interchange ramps, utilities are typically limited to electrical conduit that provides power to lights and roadway signage. Improvements to I-880 and new ramp configurations would include appropriate utilities within the right-of-way to provide nighttime lighting and power for signage. Additionally, stormwater conveyance facilities such as drainage lines and inlets would be removed and replaced in-kind.

All Build Alternatives would include relocation of existing utilities along local roadways in coordination with affected utility owners. Local roadways are anticipated to contain a broader array of utilities within the right-of-way, including telecommunication lines, water, sewer, stormwater, and gas and electric lines. Construction of any of the Build Alternatives would require temporary shutoffs of existing utilities to allow for local roadway improvements.

As a part of Measure UTL-1, utilities would be relocated to acceptable locations within the existing or new right-of-way and affected utility customers would be notified prior to any service interruption. Effects related to utilities would be temporary and would cease at the end of the construction period.

The closest fire station to the project site is Hayward Fire Department Station 4, approximately 1 mile to the northwest. No property owned or used by emergency service providers would be acquired or otherwise used as part of Build Alternative 1. However, construction activities would have the potential to temporarily disrupt roadway access within the project site, potentially affecting emergency access during construction. Measure UTL-2 would ensure that emergency service providers are notified in advance of any roadway closure or change in local access, as a part of the Transportation Management

Plan. This would allow emergency service providers to be aware of detours in advance and plan alternate routes where needed.

California Highway Patrol and Hayward Police Department offices are located 800 feet east from the I-880/Whipple Road-Industrial Parkway Southwest Interchange. There are no police stations in the vicinity of the project site. Construction of Build Alternative 1 may temporarily disrupt roadway access within the project site. Measure UTL-2 would ensure that emergency service providers are notified in advance of any roadway closure or change in local access, as a part of the Transportation Management Plan. This would allow emergency service providers to be aware of detours in advance and plan alternate routes where needed.

Operation

Operation of any of the Build Alternatives would not require the addition or expanded utility service. As a roadway and highway improvement project, Build Alternative 1 would not add demand to local utility providers. The existing I-880 corridor and local roadway network utilizes electrical utilities for nighttime lighting and signage. Once the Build Alternatives are operational, they would require similar electrical power for nighttime lighting and support for electrical signage such as changeable message boards. Operation of any of the Build Alternatives would not result in adverse effects to utilities, as the improved transportation facility would not generate a substantial demand for increased utility services.

Cumulative Impacts

Cumulative impacts arise due to the linking of impacts from past, present, and foreseeable future projects in the region. As discussed, the Build Alternatives would not result in adverse effects to utilities or emergency services. The Build Alternatives would not generate a substantial demand for increased utility services and would not affect emergency services with Measure UTL-2 applied. Therefore, the project would not contribute to any potential cumulative effects to these resources.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Measure UTL-1: Detailed utility coordination and verification will be required during the design phase of the project. The locations of the utilities will not be positively identified until design, in coordination with the affected utility owners. Any potential utility conflicts identified during the design phase will be avoided if possible. If relocation is necessary, such utilities would be relocated to locations acceptable to the utility provider within the public right-of-way. If utilities cannot be relocated within the public right-of-way, additional detailed screening of the relocation areas will be required. Coordination with all

utility owners within the project site will continue during the design and construction phases of the project.

Measure UTL-2: Emergency Services will be notified prior to construction of any temporary road closures and/or detours as part of the TMP. Caltrans would prepare and implement a TMP as a part of Measure TRA-1, described in Section 2.1.5, Traffic and Transportation. The TMP will specify all timeframes for all lane closures and detours. Implementation of the TMP will reduce short-term operational effects to police, fire, and emergency service providers that may result from construction of the project.

2.1.5 TRAFFIC AND TRANSPORTATION/PEDESTRIAN AND BICYCLE FACILITIES

This section evaluates impacts to traffic and transportation facilities that may occur from implementation of the project. The study area includes the cities of Hayward and Union City. Information in this section is drawn from the *Traffic Operation Analysis Report (TOAR)* prepared by Kittelson & Associates in October 2019.

In accordance with Senate Bill (SB) 743, Caltrans has chosen to use vehicle miles traveled (VMT) as the CEQA transportation metric for projects on the State Highway System. Caltrans is developing guidance documents to implement VMT analysis in projects on the State Highway System. Based on Caltrans final guidance, projects that achieve the internal milestone of beginning environmental analysis before December 2018 are not required to complete a VMT analysis. Thus, the following analysis utilizes “level of service” as the qualitative measure of traffic impacts.

REGULATORY SETTING

Federal

Federal Highway Administration

The Department, as assigned by the FHWA, directs that full consideration should be given to the safe accommodation of pedestrians and bicyclists during the development of federal-aid highway projects (see 23 CFR 652). It further directs that the special needs of the elderly and the disabled must be considered in all federal-aid projects that include pedestrian facilities. When current or anticipated pedestrian and/or bicycle traffic presents a potential conflict with motor vehicle traffic, every effort must be made to minimize the detrimental effects on all highway users who share the facility.

Americans with Disabilities Act

In July 1999, the USDOT issued an Accessibility Policy Statement pledging a fully accessible multimodal transportation system. Accessibility in federally assisted programs is governed by the USDOT regulations (49 CFR 27) implementing Section 504 of the Rehabilitation Act (29 USC 794). The FHWA has enacted regulations for the implementation of the 1990 ADA, including a commitment to build transportation facilities that provide equal access for all persons. These regulations require application of the ADA requirements to federal-aid projects, including Transportation Enhancement Activities.

STATE AND LOCAL REGULATIONS

State

California Complete Streets Act of 2008

This act requires circulation elements of local general plans to accommodate a multimodal transportation network that meets the needs of all users in a manner that is suitable to context of the jurisdiction. Users are defined to include all users of the transportation network, including pedestrians, bicyclists, transit riders, and drivers, along with specific groups of users such as persons with disabilities, seniors, and children.

AFFECTED ENVIRONMENT

This section describes the existing and planned transportation system within the study area, including the roadway network, transit services, and bicycle and pedestrian facilities, as discussed in the TOAR.

Access, and Circulation

Interstate Route

I-880 is a major regional freeway that runs in the north-south direction through Fremont, serving the East Bay and South Bay, and connecting State Route 17 (SR-17) in San Jose to I-980 in Oakland. In the project study area, it has three mixed-use lanes plus a HOV lane in each direction.

Arterial Roads

Whipple Road is a five-lane roadway classified as a principle arterial within the I-880/Whipple Road-Industrial Parkway Southwest interchange and a minor arterial to the west and east of the interchange. This roadway provides access between areas of Hayward and Union City. The I-880/Whipple Road-Industrial Parkway Southwest interchange also provides local access to I-880.

Industrial Parkway West is a four-lane minor arterial east-west roadway which provides access between Hesperian Boulevard, Mission Boulevard and I-880. The I-880/Industrial Parkway West Interchange provides regional access to I-880.

Study Area

The traffic study area includes the I-880/Whipple Road-Industrial Parkway Southwest and I-880/Industrial Parkway West interchanges in the cities of Hayward and Union City. It also includes three I-880 mainline segments:

- I-880 between Tennyson Road and Industrial Parkway West
- I-880 between Industrial Parkway West and Whipple Road
- I-880 between Whipple Road and Alvarado-Niles Road

Existing Traffic Operations

“Level of service” describes the operating conditions experienced by users of a facility. Level of service is a qualitative measure of the effect of various factors, including speed and travel time, traffic interruptions, freedom to maneuver, driving comfort and convenience. Levels of service are designated A through F from best to worst, which cover the range of potential traffic operations. LOS A through E generally represents traffic volumes at less than roadway capacity, while LOS F represents over capacity and/or forced flow conditions. Detailed methodologies for determining LOS for freeway and intersection operations is provided in the TOAR.

Freeway Operations

The freeway segment LOS findings for the AM and PM peak hours during the existing condition are shown in Table 2.1.5-1 and Table 2.1.5-2. As shown, southbound freeway segments in the AM peak hour and northbound segments in the PM peak hour operate below the LOS D standard. Additionally, the segment between Whipple Road and Alvarado-Niles Road, and the Industrial Parkway West to Whipple Road segment in the PM peak hour operate at LOS E. The remaining segments are within the LOS D standard.

Table 2.1.5-1 AM Peak Hour I-880 Freeway Operations

AM Peak Hour (7:45 - 8:45 AM)					
ID	Segment	Direction	Method	Density	LOS
1	Alvarado-Niles Road to Whipple Road	NB	HCM 6	21.6	C
2	Whipple Road to Industrial Parkway West	NB	HCM 6	24.7	C
3	Industrial Parkway West to Tennyson Road	NB	HCM 6	21.1	C
4	Tennyson Road to Industrial Parkway West	SB	Field Data	69.3	F
5	Industrial Parkway West to Whipple Road	SB	Field Data	83.2	F
6	Whipple Road to Alvarado-Niles Road	SB	Field Data	68.9	F

Source: Traffic Operations Analysis Report, 2019
LOS = Level of Service

Table 2.1.5-2 PM Peak Hour I-880 Freeway Operations

PM Peak Hour (5:00 - 6:00 PM)					
1	Alvarado-Niles Road to Whipple Road	NB	Field Data	82.5	F
2	Whipple Road to Industrial Parkway West	NB	Field Data	89.2	F
3	Industrial Parkway West to Tennyson Road	NB	Field Data	69.3	F
4	Tennyson Road to Industrial Parkway West	SB	HCM 6	29.0	D
5	Industrial Parkway West to Whipple Road	SB	HCM 6	38.5	E
6	Whipple Road to Alvarado-Niles Road	SB	Leisch	N/A	E

Source: Traffic Operations Analysis Report, 2019
LOS = Level of Service

Intersection Operations

Results of the intersection LOS analysis for the existing condition AM and PM peak hours are shown in Table 2.1.5-3 and Table 2.1.5-4. As shown, none of the intersections analyzed operate below the LOS standard under existing conditions.

Table 2.1.5-3 Existing AM Peak Hour Intersection Operations

Intersection Name	Control Type	LOS Standard	V/C	Delay (s/veh)	LOS
I-880 SB Ramps/Dyer Street & Whipple Road	Signalized	E	0.94	60.4	E
I-880 NB Ramps & Whipple Road	Signalized	E	1.00	44.8	D
I-880 SB Ramps & Industrial Parkway West	Signalized	E	0.82	37.4	D
I-880 NB Ramps & Industrial Parkway West	Two-way stop	E	0.36	18.5	C

Source: Traffic Operations Analysis Report, 2019

Grey highlight indicates intersection operated below LOS standard

V/C = Volume to Capacity; s/veh = vehicle delay per second; LOS = Level of Service

Table 2.1.5-4 Existing PM Peak Hour Intersection Operations

Intersection Name	Control Type	LOS Standard	V/C	Delay (s/veh)	LOS
I-880 SB Ramps/Dyer Street & Whipple Road	Signalized	E	0.79	48.1	D
I-880 NB Ramps & Whipple Road	Signalized	E	1.00	58.4	E
I-880 SB Ramps & Industrial Parkway West	Signalized	E	0.83	28.0	C
I-880 NB Ramps & Industrial Parkway West	Two-way stop	E	0.47	16.7	C

Source: Traffic Operations Analysis Report, 2019

Grey highlight indicates intersection operated below LOS standard

LOS = Level of Service; V/C = Volume to Capacity; s/veh = vehicle delay per second

Queuing Analysis

Findings for the 95th percentile queue lengths for the AM and PM peak hours at the four ramp terminal intersections for existing conditions are shown Table 2.1.5-3 and Table 2.1.5-4. The following locations are where the 95th percentile queue exceeds the available storage under existing conditions assuming 25 feet per vehicle:

- I-880 SB Ramps/Dyer Street & Whipple Road (AM & PM Peak Hours)
 - NBL – Exceeds storage by 2 to 3 vehicles
 - SBR – Exceeds storage by 3 to 43 vehicles
 - EBR – Exceeds storage by 6 vehicles
- I-880 NB Ramps & Whipple Road (AM & PM Peak Hours)
 - NBL (Off-Ramp) – Exceeds storage by 5 vehicles
 - NBR (Off-Ramp) – Exceeds storage by 11 vehicles
 - EBL – Exceeds storage by 9 vehicles

- WBT – Exceeds storage by 4 vehicles
- WBR – Exceeds storage by 7 vehicles
- I-880 SB Ramps & Industrial Parkway West (AM & PM Peak Hours)
 - WBR – Exceeds storage by 2 to 3 vehicles

Table 2.1.5-5 Existing Conditions 95th Percentile Queue Length in Vehicles

Intersection Name	Scenario	Northbound			Southbound			Eastbound			Westbound		
		Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
I-880 SB Ramps/Dyer Street & Whipple Road	Storage	6	19	19	11	43	16	87	87	12	27	27	N/A
	Existing AM	8	12	1	9	11	59	11	11	9	9	9	N/A
	Existing PM	9	19	6	11	14	19	17	18	18	11	10	N/A
I-880 NB Ramps & Whipple Road	Storage	15	48	17	54	N/A	54	11	42	N/A	N/A	15	9
	Existing AM	20	20	28	15	N/A	11	8	15	N/A	N/A	13	9
	Existing PM	10	39	17	13	N/A	7	20	14	N/A	N/A	19	16
I-880 SB Ramps & Industrial Parkway West	Storage	N/A	N/A	N/A	42	N/A	N/A	15	100	N/A	N/A	31	7
	Existing AM	N/A	N/A	N/A	30	N/A	N/A	7	7	N/A	N/A	15	10
	Existing PM	N/A	N/A	N/A	19	N/A	N/A	14	8	N/A	N/A	13	9
I-880 NB Ramps & Industrial Parkway West	Storage	N/A	N/A	N/A	N/A	N/A	N/A	11	31	N/A	N/A	25	N/A
	Existing AM	N/A	N/A	N/A	N/A	N/A	N/A	2	0	N/A	N/A	0	N/A
	Existing PM	N/A	N/A	N/A	N/A	N/A	N/A	3	0	N/A	N/A	0	N/A

Source: Traffic Operations Analysis Report, 2019

Grey highlighted cells represent movements that have a 95th percentile queue longer than the available storage.

N/A = Not Applicable

Transit

Alameda-Contra Costa Transit District (AC Transit)

AC Transit provides bus transit service throughout the East Bay. There are numerous bus routes that run along major streets in Hayward, connecting to the adjacent cities of Union City and San Leandro. The following bus routes currently operate in the project study area.

- Route SB operates between the SalesForce Transit Center in San Francisco and Newpark Mall in Newark via I-880 and Industrial Parkway West. This route operates in the San Francisco bound direction between 5:25 a.m. and 9:30 a.m. and in the Newark bound direction from 3:30 p.m. to 8:20 p.m. on weekdays only with 40-minute headways.
- Route 41 connects the Hayward BART Station and Union City Transit Center via Whipple Road in the project study area. Route 41 operates with 40-minute headways between 6:00 a.m. and 10:40 p.m. on weekdays. On weekends Route 41 operates from 6:10 am to 10:40 pm also with 60-minute headways.
- Route 56 connects the Hayward BART Station and Union City Transit Center via Stratford Road and Industrial Parkway West in the project study area. This route operates with 30-minute headways between 6:30 a.m. and 11:00 p.m. on weekdays and Saturdays. On weekdays headways are 40-minutes and 60-minutes on Saturdays.

Union City Transit is a local, city-run fixed route bus system that serves the City of Union City. Union City Transit provides connections with AC Transit, BART and the Dumbarton Express for unified access to other transportation options in the Bay Area. The following bus routes currently operate in the project study area.

- Route 2 connects the Kaiser Permanente Medical Offices and the Union City BART Station via Whipple Road in the project study area. This route operates with 30-minute headways between 5:15 a.m. and 9:00 p.m. on weekdays. On weekends Route 2 operates from 7:30 a.m. to 7:00 p.m. also at 60-minute headways.
- Route 4 connects the Union Landing Transit Center and Union City BART Station via Whipple Road in the project study area. Route 4 operates with 60-minute headways between 6:40 a.m. and 8:40 p.m. on weekdays. On weekends this route operates from 8:30 a.m. to 7:15 p.m. also with 60-minute headways.

- Route 7 connects the Union Landing Transit Center, Kaiser Permanente Medical Offices and Calaveras Landing via Whipple Road in the project study area. Route 7 operates with 60-minute headways between 10:00 a.m. and 4:45 p.m. on weekdays. On weekends Route 7 operates from 9:30 a.m. to 5:30 p.m. also with 60-minute headways.

Pedestrian Facilities

Existing pedestrian accommodations at the interchanges include:

- Whipple Road – A sidewalk is provided along the north side of Whipple Road between the southbound and northbound off-ramps. No sidewalk is provided along the south side.
- Industrial Parkway West – Sidewalks are provided along the north and south side of Industrial Parkway West through the I-880 interchange.

Peak hour intersection counts for pedestrians are included in the TOAR.

Bicycle Facilities

On-street bike paths provide vital connections throughout Hayward and Union City, including connections to regional parks and schools. However, the existing bikeways in both cities are often incomplete, leaving cyclists with sections of road that are difficult and dangerous to ride. Bicycle facilities include the following general types:

- Class I: Shared Use Path - These facilities provide a separate right-of-way and are designated for the exclusive use of bicycles and pedestrians with vehicle cross-flow minimized.
- Class II: Bicycle Lane - Bicycle lanes provide a restricted right-of-way and are designated for the use of bicycles for one-way travel with a striped lane on a street or highway. Bicycle lanes are generally a minimum of 5 feet wide. Vehicle parking and vehicle/pedestrian cross-flow are permitted.
- Class III: Bicycle Route with Sharrows - These bikeways provide right-of-way designated by signs or pavement markings for shared use with motor vehicles. These include sharrows or “shared lane markings” to highlight the presence of bicyclists.

I-880 Industrial Parkway West Interchange

The Hayward Bicycle Master Plan of 2007 shows an existing Class III bike lane that runs along Industrial Parkway, including the I-880 Industrial Parkway West Interchange. However, this bike lane appears to be unmarked and shares a lane with vehicular traffic.

I-880 Whipple Road-Industrial Parkway Southwest Interchange

There is an existing Class III bike lane on Whipple Road, west of the I-880/Whipple Road-Industrial Parkway Southwest Interchange. This bike lane ends at Union City Boulevard before the I-880 overpass. There are no bike lanes located at the I-880/Whipple Road-Industrial Parkway Southwest Interchange.

A summary of bicycle counts during the AM and PM peak hours are shown in the TOAR.

ENVIRONMENTAL CONSEQUENCES

Future year traffic operations were evaluated using forecasted traffic demands based on anticipated growth as predicted by the May 2018 version of the Alameda CTC Countywide Travel Demand Model with ABAG Plan Bay Area Projects. Future traffic forecasts were developed for the following scenarios:

- Opening Year (2025) No Project
- Opening Year (2025) Plus Project
- Cumulative Year (2045) No Project
- Cumulative Year (2045) Plus Project

A detailed description of traffic forecast is included in the TOAR.

2025 Traffic Operations

Freeway Analysis

The year 2025 freeway operations uses a similar approach to what was described in the Existing Conditions section. Locations that were not congested under existing conditions and were analyzed using HCM 6 methodologies or Leisch Nomographs were reanalyzed using these same methods but with the updated traffic volumes corresponding to 2025 conditions. At the six existing condition locations that were congested, the 2025 analysis applied the volume differential from the travel demand model between existing and 2025 conditions to recompute the estimated density. The resulting freeway operations for the Build Alternatives are shown in Table 2.1.5-6 and Table 2.1.5-7. As shown in these two tables, the freeway mainline is not significantly affected with most segments remaining at

the same LOS for the No-Project Alternative as well as the Build Alternatives. The one exception was the northbound segment between Whipple Road and Industrial Parkway West which went from LOS C under the No-Project Alternative to LOS D for the Build Alternatives. This is because the Build Alternatives would construct a new northbound off-ramp at Industrial Parkway West causing traffic that currently gets off the freeway at Whipple Road to stay on the freeway slightly longer to use the new off-ramp. Details of the freeway analysis are provided in the TOAR.

Table 2.1.5-6 2025 AM Peak Hour I-880 Freeway Operations

AM Peak Hour (7:45 – 8:45 AM)							
ID	Segment	Direction	Method	2025 No-Build Alternative		2025 Build Alternatives ¹	
				Density	LOS	Density	LOS
1	Alvarado-Niles Road to Whipple Road	NB	HCM 6	22.3	C	22.7	C
2	Whipple Road to Industrial Parkway West	NB	HCM 6	25.3	C	27.8	D
3	Industrial Parkway West to Tennyson Road	NB	HCM 6	21.6	C	20.6	C
4	Tennyson Road to Industrial Parkway West	SB	Field Data	71.2	F	71.2	F
5	Industrial Parkway West to Whipple Road	SB	Field Data	85.7	F	85.3	F
6	Whipple Road to Alvarado-Niles Road	SB	Field Data	79.9	F	80.2	F

Source: Traffic Operations Analysis Report, 2019

¹ Freeway mainline operations are the same for Build 1 and Build 2 Alternatives

LOS = Level of Service

Table 2.1.5-7 2025 PM Peak Hour I-880 Freeway Operations

PM Peak Hour (5:00 – 6:00 PM)							
ID	Segment	Direction	Method	2025 No-Build Alternative		2025 Build Alternatives ¹	
				Density	LOS	Density	LOS
1	Alvarado-Niles Road to Whipple Road	NB	Field Data	85.9	F	87.2	F
2	Whipple Road to Industrial Parkway West	NB	Field Data	93.4	F	97.2	F
3	Industrial Parkway West to Tennyson Road	NB	Field Data	72.4	F	70.6	F
4	Tennyson Road to Industrial Parkway West	SB	HCM 6	30.7	D	30.7	D
5	Industrial Parkway West to Whipple Road	SB	HCM 6	41.4	E	41.6	E
6	Whipple Road to Alvarado-Niles Road	SB	Leisch	-	E	-	E

Source: Traffic Operations Analysis Report, 2019

¹ Freeway mainline operations are the same for Build 1 and Build 2 Alternatives
LOS = Level of Service

Intersection Analysis

The year 2025 intersection operations were based on projected weekday AM and PM peak hour traffic volumes for the No-Build Alternative condition and for each of the Build Alternatives. Details of the intersection analysis are provided in the TOAR.

Whipple Road Interchange

I-880/Whipple Road-Industrial Parkway Southwest Interchange improvements are proposed in Build Alternative 1 and in Design Variation 1 as shown in the plans located in the TOAR. Build Alternative 1 would replace the three existing I-880/Whipple Road-Industrial Parkway Southwest Interchange undercrossing structures with one undercrossing structure and improve bicycle and pedestrian facilities across the

interchange along Whipple Road. Design Variation 1 of Build Alternative 1 would preserve the three existing Whipple Road undercrossing structures and make improvements to the interchange and local roads within the constraints of the existing structures.

The TOAR evaluated the 2025 intersection operations for Build Alternative 1 against the 2025 No-Build Alternative for the AM Whipple Road Interchange and PM I-880/Whipple Road-Industrial Parkway Southwest Interchange peak hours. Intersection operations would improve at the northbound ramp terminal intersection during the AM and PM peak hours, but the southbound ramp terminal would exhibit a slight increase in delay during the PM peak hour. However, study intersections would operate at LOS D or better and a Volume to Capacity (V/C) ratio of 0.78 or better with Build Alternative 1 during the AM and PM peak hours.

Compared to the Design Variation 1 described later, Build Alternative 1 would operate similarly with the main differences in delay attributable to variations in signal timing rather than one option being geometrically superior to another from an operations perspective.

The TOAR also evaluated 2025 intersection operations for Design Variation 1 against the 2025 No-Build Alternative for the AM Whipple Road Interchange and PM Whipple Road Interchange peak hours. Intersection operations would improve at both ramp terminal intersections as a result of Design Variation 1. All study intersections are forecast to operate at LOS D or better with a V/C ratio of 0.80 or less.

Table 2.1.5-8 2025 AM Peak Hour Operations at Whipple Road Interchange

Intersection Name	Control Type	LOS Standard	2025 No-Build Alternative			2025 + Build Alternative 1			2025 + Design Variation 1		
			V/C	Delay (s/veh)	LOS	V/C	Delay (s/veh)	LOS	V/C	Delay (s/veh)	LOS
I-880 SB Ramps/Dyer Street & Whipple Road	Signalized	E	0.98	68.7	E	0.73	35.0	D	0.72	33.0	C
I-880 NB Ramps & Whipple Road	Signalized	E	1.06	52.6	D	0.78	46.0	D	0.81	45.1	D

Source: Traffic Operations Analysis Report, 2019
LOS = Level of Service; V/C = Volume to Capacity; s/veh = vehicle delay per second

Table 2.1.5-9 2025 PM Peak Hour Operations at Whipple Road Interchange

Intersection Name	Control Type	LOS Standard	2025 No-Build Alternative			2025 + Build Alternative 1			2025 + Design Variation 1		
			V/C	Delay (s/veh)	LOS	V/C	Delay (s/veh)	LOS	V/C	Delay (s/veh)	LOS
I-880 SB Ramps/Dyer Street & Whipple Road	Signalized	E	0.87	51.2	D	0.76	51.4	D	0.76	47.7	D
I-880 NB Ramps & Whipple Road	Signalized	E	1.03	66.3	E	0.76	42.8	D	0.80	43.4	D

Source: Traffic Operations Analysis Report, 2019
LOS = Level of Service; V/C = Volume to Capacity; s/veh = vehicle delay per second

Industrial Parkway West Interchange

The I-880/Industrial Parkway West Interchange improvements are proposed in Build Alternative 1, Build Alternative 2, and Build Alternative 3 as shown in the plans located in the TOAR. All three Build Alternatives would replace the existing I-880/Industrial Parkway West overcrossing structure and reconfigure the northbound I-880 ramps. Build Alternative 1 would reconfigure the southbound ramps into a tight diamond configuration removing the existing loop on-ramp. Build Alternative 2 would add a new diagonal southbound on-ramp but preserve the southbound loop on-ramp. Build Alternative 3 would widen the existing southbound diagonal off-ramp and southbound loop on-ramp but not construct the southbound diagonal on-ramp.

The TOAR evaluated the 2025 intersection operations for the three Build Alternatives against the 2025 No-Build Alternative for the AM I-880/Industrial Parkway West Interchange and PM I-880/Industrial Parkway West Interchange peak hours. Intersection operations would improve at both ramp terminal intersections as a result of Build Alternative 1 and Build Alternative 2. The northbound bound ramp terminal intersection for Build Alternative 3 showed an increase in average delay by about 4 seconds per vehicle. However, all three Build Alternatives result in the two ramp terminal intersections operating at LOS C or better with a V/C ratio of 0.82 or less.

Comparing the three Build Alternatives, the northbound ramp terminal intersection operations were similar with small differences caused by signal timing variations required to maintain coordination with the southbound ramp terminal intersection. Build Alternative 2 had the least delay at the southbound ramp terminal intersection compared to Build Alternative 1 and 3 because it does not require a left turn signal phase. This reduces the number of signal phases at the southbound ramp terminal intersection resulting in improved operations for Build Alternative 2 compared to the other two Build Alternatives. Both ramp terminal intersections were able to maintain LOS C or better operations in 2025 for all three Build Alternatives.

Table 2.1.5-10 2025 AM Peak Hour Operations at Industrial Parkway West Interchange

Intersection Name	Control Type	LOS Standard	2025 No-Build Alternative			2025 + Build Alternative 1			2025 + Build Alternative 2			2025 + Build Alternative 3		
			V/C	Delay (s/veh)	LOS	V/C	Delay (s/veh)	LOS	V/C	Delay (s/veh)	LOS	V/C	Delay (s/veh)	LOS
I-880 SB Ramps & Industrial Parkway West	Signalized	E	0.89	41.7	D	0.82	27.2	C	0.77	17.3	B	0.67	22.7	C
I-880 NB Ramps & Industrial Parkway West	TWSC ¹ / Signalized	E	0.44	23.8	C	0.79	20.8	C	0.80	20.6	C	0.78	27.3	C

Source: Traffic Operations Analysis Report, 2019

¹Two-Way Stop Controlled (TWSC) No Project, Signalized under Plus Project

LOS = Level of Service; V/C = Volume to Capacity; s/veh = vehicle delay per second

Table 2.1.5-11 2025 PM Peak Hour Operations at Industrial Parkway West Interchange

Intersection Name	Control Type	LOS Standard	2025 No-Build Alternative			2025 + Build Alternative 1			2025 + Build Alternative 2			2025 + Build Alternative 3		
			V/C	Delay (s/veh)	LOS	V/C	Delay (s/veh)	LOS	V/C	Delay (s/veh)	LOS	V/C	Delay (s/veh)	LOS
I-880 SB Ramps & Industrial Parkway West	Signalized	E	0.88	36.3	D	0.75	22.8	C	0.54	10.7	B	0.57	21.8	C
I-880 NB Ramps & Industrial Parkway West	TWSC ¹ / Signalized	E	0.50	17.9	C	0.66	17.8	B	0.68	16.4	B	0.66	24.5	C

Source: Traffic Operations Analysis Report, 2019

¹Two-Way Stop Controlled (TWSC) No Project, Signalized under Plus Project

LOS = Level of Service; V/C = Volume to Capacity; s/veh = vehicle delay per second

Queue Analysis

The TOAR evaluated the maximum (95th percentile probability) queues on individual intersection approaches using the HCM 6 methodologies as implemented by VISTRO. The average length per vehicle was assumed to be 25 feet. The VISTRO reports containing these queue lengths are provided in the TOAR.

Whipple Road-Industrial Parkway West Interchange

The 95th percentile queue lengths in vehicles for 2025 conditions are shown in Table 2.1.5-12 and Table 2.1.5-13 for Build Alternative 1 and Design Variation 1, respectively. Design Variation 1 is discussed in detail in Chapter 1, Proposed Project. A summary of where these two options would cause the queue to exceed the available storage or where they would cause a queue already exceeding storage under the No-Build Alternative to increase include:

- Build Alternative 1
 - I-880 SB Ramps/Dyer Street & Whipple Road
 - NBL – Would exceed the available storage under the No-Build Alternative PM conditions by four vehicles and would increase by one vehicle as a result of Build Alternative 1
 - SBL – Would exceed the available storage by three vehicles as a result of Build Alternative 1 during the PM peak hour
 - EBR – Would exceed the available storage under No-Build Alternative PM conditions by eight vehicles and would increase by three vehicles as a result of Build Alternative 1
 - I-880 NB Ramps & Whipple Road
 - Build Alternative 1 would not cause a queue to exceed available storage or result in a queue already exceeding storage under the No-Build Alternative to increase.
- Design Variation 1
 - I-880 SB Ramps/Dyer Street & Whipple Road
 - NBL – Would exceed the available storage under the No-Build Alternative PM conditions by four vehicles and would increase by one vehicle as a result of Design Variation 1

- SBL – Would exceed the available storage by one vehicle as a result of Design Variation 1 during the PM peak hour
- EBR – Would exceed the available storage under the No-Build Alternative PM conditions by eight vehicles and would increase by two vehicles as a result of Design Variation 1
- I-880 NB Ramps & Whipple Road
 - Design Variation 1 would not cause a queue to exceed storage or result in a queue already exceeding storage under the No-Build Alternative to increase.

Industrial Parkway West Interchange

The 95th percentile queue lengths in vehicles for 2025 conditions are shown in Table 2.1.5-12, Table 2.1.5-15, and Table 2.1.5-16 for Build Alternative 1, Build Alternative 2, and Build Alternative 3, respectively. A summary of where the three Build Alternatives would cause the queue to exceed the available storage or where the Build Alternatives would cause a queue already exceeding storage under the No-Build Alternative to increase include:

- Build Alternative 1
 - I-880 SB Ramps & Industrial Parkway West
 - WBL – The 95th percentile queue length in the AM and PM peak hours is anticipated to exceed the available storage (12 vehicles) by two vehicles.
 - I-880 NB Ramps & Industrial Parkway West
 - EBL – The 95th percentile queue length in the PM peak hour is anticipated to exceed the available storage (11 vehicles) by three vehicles.
- Build Alternative 2
 - I-880 SB Ramps/Dyer Street & Whipple Road
 - Build Alternative 2 would not cause a queue to exceed storage or result in a queue already exceeding storage under the No-Build Alternative to increase.

- I-880 NB Ramps & Whipple Road
 - Build Alternative 2 would not cause a queue to exceed storage or result in a queue already exceeding storage under the No-Build Alternative to increase.
- Build Alternative 3
 - I-880 SB Ramps/Dyer Street & Whipple Road
 - Build Alternative 3 would not cause a queue to exceed storage or result in a queue already exceeding storage under the No-Build Alternative to increase.
 - I-880 NB Ramps & Whipple Road
 - WBL – The 95th percentile queue length in the AM peak hour is anticipated to exceed the available storage (19 vehicles) by two vehicles.

Table 2.1.5-12 2025 95th Percentile Queue Length (Vehicles) at Whipple Road Interchange (Build Alternative 1)

Intersection Name	Scenario	Northbound			Southbound			Eastbound			Westbound		
		Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
I-880 SB Ramps/Dyer Street & Whipple Road	Storage NBA	6	19	19	11	43	16	87	87	12	27	27	N/A
	AM NBA	9	14	2	9	12	67	12	12	10	9	10	N/A
	PM NBA	10	20	6	11	14	26	19	19	20	11	10	N/A
	Storage BA1	6	19	19	10	43	8	87	87	12	27	27	N/A
	AM BA1	9	10	1	9	7	5	14	14	11	7	10	N/A
	PM BA1	11	16	5	13	8	4	22	22	23	12	11	N/A
I-880 NB Ramps & Whipple Road	Storage NBA	15	48	17	54	N/A	54	11	42	N/A	N/A	15	9
	AM NBA	21	23	33	23	N/A	11	9	17	N/A	N/A	13	10
	PM NBA	10	41	17	14	N/A	7	20	14	N/A	N/A	23	17
	Storage BA1	12	48	8	54	N/A	54	42	42	N/A	N/A	15	9
	AM BA1	12	10	13	8	N/A	27	10	13	N/A	N/A	11	6
	PM BA1	11	17	4	7	N/A	18	19	6	N/A	N/A	13	13

Source: Traffic Operations Analysis Report, 2019

Grey highlighted cells represent movements that have a 95th percentile queue longer than the available storage.

NBA = No-Build Alternative; BA1 = Build Alternative 1; N/A = Not Applicable

Table 2.1.5-13 2025 95th Percentile Queue Length (Vehicles) at Whipple Road Interchange (Design Variation 1)

Intersection Name	Scenario	Northbound			Southbound			Eastbound			Westbound		
		Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
I-880 SB Ramps/Dyer Street & Whipple Road	Storage NBA	6	19	19	11	43	16	87	87	12	27	27	N/A
	AM NBA	9	14	2	9	12	67	12	12	10	9	10	N/A
	PM NBA	10	20	6	11	14	26	19	19	20	11	10	N/A
	Storage DV1	6	19	19	11	43	16	87	87	12	27	27	N/A
	AM DV1	9	11	1	9	11	1	13	13	10	7	10	N/A
	PM DV1	11	17	5	12	13	1	20	21	22	12	11	N/A
I-880 NB Ramps & Whipple Road	Storage NBA	15	48	17	54	N/A	54	11	42	N/A	N/A	15	9
	AM NBA	21	23	33	23	N/A	11	9	17	N/A	N/A	13	10
	PM NBA	10	41	17	14	N/A	7	20	14	N/A	N/A	23	17
	Storage DV1	11	48	14	54	N/A	54	42	42	N/A	N/A	15	9
	AM DV1	12	9	11	9	N/A	27	10	13	N/A	N/A	12	6
	PM DV1	10	17	4	7	N/A	18	19	6	N/A	N/A	14	13

Source: Traffic Operations Analysis Report, 2019

Grey highlighted cells represent movements that have a 95th percentile queue longer than the available storage.

NBA = No-Build Alternative; DV1 = Design Variation 1; N/A = Not Applicable

Table 2.1.5-14 2025 95th Percentile Queue Length (Vehicles) at Industrial Parkway West Interchange (Build Alternative 1)

Intersection Name	Scenario	Northbound			Southbound			Eastbound			Westbound		
		Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
I-880 SB Ramps & Industrial Parkway	Storage NBA	N/A	N/A	N/A	42	N/A	N/A	15	100	N/A	N/A	31	7
	AM NBA	N/A	N/A	N/A	32	N/A	N/A	7	7	N/A	N/A	19	10
	PM NBA	N/A	N/A	N/A	28	N/A	N/A	14	9	N/A	N/A	14	9
	Storage BA1	N/A	N/A	N/A	40	N/A	21	N/A	27	27	12	12	N/A
	AM BA1	N/A	N/A	N/A	10	N/A	18	N/A	15	7	14	11	N/A
	PM BA1	N/A	N/A	N/A	10	N/A	14	N/A	16	11	14	4	N/A
I-880 NB Ramps & Industrial Parkway	Storage NBA	N/A	N/A	N/A	N/A	N/A	N/A	11	31	N/A	N/A	25	N/A
	AM NBA	N/A	N/A	N/A	N/A	N/A	N/A	3	0	N/A	N/A	0	N/A
	PM NBA	N/A	N/A	N/A	N/A	N/A	N/A	3	0	N/A	N/A	0	N/A
	Storage BA1	52	N/A	52	N/A	N/A	N/A	11	14	N/A	N/A	44	18
	AM BA1	14	N/A	5	N/A	N/A	N/A	8	4	N/A	N/A	11	15
	PM BA1	12	N/A	5	N/A	N/A	N/A	14	2	N/A	N/A	7	10

Source: Traffic Operations Analysis Report, 2019

Grey highlighted cells represent movements that have a 95th percentile queue longer than the available storage.

NBA = No-Build Alternative; BA1 = Build Alternative 1; N/A = Not Applicable

Table 2.1.5-15 2025 95th Percentile Queue Length (Vehicles) at Industrial Parkway West Interchange (Build Alternative 2)

Intersection Name	Scenario	Northbound			Southbound			Eastbound			Westbound		
		Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
I-880 SB Ramps & Industrial Parkway West	Storage NBA	N/A	N/A	N/A	42	N/A	N/A	15	100	N/A	N/A	31	7
	AM NBA	N/A	N/A	N/A	32	N/A	N/A	7	7	N/A	N/A	19	10
	PM NBA	N/A	N/A	N/A	28	N/A	N/A	14	9	N/A	N/A	14	9
	Storage BA2	N/A	N/A	N/A	40	N/A	20	N/A	21	8	N/A	16	7
	AM BA2	N/A	N/A	N/A	9	N/A	17	N/A	4	3	N/A	11	6
	PM BA2	N/A	N/A	N/A	8	N/A	11	N/A	4	4	N/A	4	3
I-880 NB Ramps & Industrial Parkway West	Storage NBA	N/A	N/A	N/A	N/A	N/A	N/A	11	31	N/A	N/A	25	N/A
	AM NBA	N/A	N/A	N/A	N/A	N/A	N/A	3	0	N/A	N/A	0	N/A
	PM NBA	N/A	N/A	N/A	N/A	N/A	N/A	3	0	N/A	N/A	0	N/A
	Storage BA2	52	N/A	52	N/A	N/A	N/A	16	18	N/A	N/A	44	18
	AM BA2	13	N/A	4	N/A	N/A	N/A	7	5	N/A	N/A	10	16
	PM BA2	10	N/A	4	N/A	N/A	N/A	11	3	N/A	N/A	7	10

Source: Traffic Operations Analysis Report, 2019

Grey highlighted cells represent movements that have a 95th percentile queue longer than the available storage.

NBA = No-Build Alternative; BA2 = Build Alternative 2; N/A = Not Applicable

Table 2.1.5-16 2025 95th Percentile Queue Length (Vehicles) at Industrial Parkway West Interchange (Build Alternative 3)

Intersection Name	Scenario	Northbound			Southbound			Eastbound			Westbound		
		Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
I-880 SB Ramps & Industrial Parkway West	Storage NBA	N/A	N/A	N/A	42	N/A	N/A	15	100	N/A	N/A	31	7
	AM NBA	N/A	N/A	N/A	32	N/A	N/A	7	7	N/A	N/A	19	10
	PM NBA	N/A	N/A	N/A	28	N/A	N/A	14	9	N/A	N/A	14	9
	Storage BA3	N/A	N/A	N/A	40	N/A	20	N/A	20	0	N/A	18	8
	AM BA3	N/A	N/A	N/A	13	N/A	11	N/A	7	0	N/A	16	2
	PM BA3	N/A	N/A	N/A	11	N/A	8	N/A	9	0	N/A	11	3
I-880 NB Ramps & Industrial Parkway West	Storage NBA	N/A	N/A	N/A	N/A	N/A	N/A	11	31	N/A	N/A	25	N/A
	AM NBA	N/A	N/A	N/A	N/A	N/A	N/A	3	0	N/A	N/A	0	N/A
	PM NBA	N/A	N/A	N/A	N/A	N/A	N/A	3	0	N/A	N/A	0	N/A
	Storage BA3	52	N/A	52	N/A	N/A	N/A	17	20	N/A	N/A	44	19
	AM BA3	16	N/A	6	N/A	N/A	N/A	9	13	N/A	N/A	15	21
	PM BA3	12	N/A	5	N/A	N/A	N/A	15	11	N/A	N/A	12	15

Source: Traffic Operations Analysis Report, 2019

Grey highlighted cells represent movements that have a 95th percentile queue longer than the available storage.

NBA = No-Build Alternative; BA2 = Build Alternative 3; N/A = Not Applicable

Ramp Meter Storage Analysis

Chapter 1, Section 4 of the Caltrans Ramp Metering Design Manual (Design Manual) stipulates there should be sufficient storage behind the ramp meter limit line to accommodate a queue that is equal to 7 percent of the peak hour demand for the general-purpose lanes. HOV volumes may be removed from the analysis as they are provided with an HOV bypass lane. HOV volumes were estimated based on the percent of HOV vehicles in the traffic forecasting model. Using the 2025 forecast ramp demand volumes, the 7 percent storage requirement, estimated HOV percentages, and assuming 29 feet of spacing per queued vehicle, this section compares the provided storage with the Design Manual requirements for 2025. This section also documents the projected minimum metering rate that would be required to prevent the ramp metering queue from extending into the adjacent intersection.

Whipple Road Interchange

The Whipple Road interchange has three on-ramps including the southbound I-880 diagonal on-ramp, the northbound I-880 loop on-ramp, and the northbound I-880 diagonal on-ramp. The primary difference between Build Alternative 1 and Design Variation 1 for ramp metering storage is that Build Alternative 1 will have a separate metering light for the northbound I-880 loop ramp and diagonal ramp. Design Variation 1 will maintain the current configuration where both the northbound loop ramp and diagonal ramp are metered at the same location.

The resulting calculations for ramp storage at the Whipple Road Interchange in 2025 for the AM and PM peak hours for Build Alternative 1 are shown in Table 2.1.5-17 and Table 2.1.5-18, respectively. The same information for Design Variation 1 is shown in Table 2.1.5-19 (AM Peak Hour) and Table 2.1.5-20 (PM Peak Hour). The on-ramp storage for both the northbound loop and diagonal on-ramps is sufficient for both Build Alternative 1 and Design Variation 1.

The Whipple Road southbound on-ramp, which is not being modified by the Project, does not provide sufficient storage to meet the Caltrans guidance under both the No Build and Build Alternatives. However, both Build Alternatives have less demand for the southbound on-ramp during the PM peak hour reducing the potential ramp meter queue compared to the No Project Alternative.

Table 2.1.5-17 2025 AM Ramp Storage at Whipple Road Interchange
(Build Alternative 1)

	Whipple SB Diagonal		Whipple NB Loop		Whipple NB Diagonal	
	No Project	Project	No Project	Project	No Project	Project
Demand	652	639	280	281	275	282
HOV %	23%	23%	26%	0%	23%	0%
Demand to Store	35	34	15	20	15	20
Required Storage (ft)	1,015	986	435	580	435	580
Provided Storage (ft)	1,120	1,120	2,050	1,724	1,320	945
Difference (ft)	105	134	1,615	1,144	885	365

Source: Traffic Operations Analysis Report, 2019
Grey highlighted cells represent insufficient ramp metering storage

Table 2.1.5-18 2025 PM Ramp Storage at Whipple Road Interchange
(Build Alternative 1)

	Whipple SB Diagonal		Whipple NB Loop		Whipple NB Diagonal	
	No Project	Project	No Project	Project	No Project	Project
Demand	920	908	276	265	265	271
HOV %	13%	13%	14%	0%	12%	0%
Demand to Store	56	55	17	19	16	19
Required Storage (ft)	1,624	1,595	493	551	464	551
Provided Storage (ft)	1,120	1,120	2,050	1,724	1,320	945
Difference (ft)	-504	-475	1,557	1,173	856	394

Source: Traffic Operations Analysis Report, 2019
Grey highlighted cells represent insufficient ramp metering storage

Table 2.1.5-19 2025 AM Ramp Storage at Whipple Road Interchange
(Design Variation 1)

	Whipple SB Diagonal		Whipple NB Loop		Whipple NB Diagonal	
	No Project	Project	No Project	Project	No Project	Project
Demand	652	639	280	281	275	282
HOV %	23%	23%	26%	0%	23%	0%
Demand to Store	35	34	15	20	15	20
Required Storage (ft)	1,015	986	435	580	435	580
Provided Storage (ft)	1,120	1,120	2,050	1,013	1,320	972
Difference (ft)	105	134	1,615	433	885	392

Source: Traffic Operations Analysis Report, 2019
Grey highlighted cells represent insufficient ramp metering storage

Table 2.1.5-20 2025 PM Ramp Storage at Whipple Road Interchange
(Design Variation 1)

	Whipple SB Diagonal		Whipple NB Loop		Whipple NB Diagonal	
	No Project	Project	No Project	Project	No Project	Project
Demand	920	908	276	265	265	271
HOV %	13%	13%	14%	0%	12%	0%
Demand to Store	56	55	17	19	16	19
Required Storage (ft)	1,624	1,595	493	551	464	551
Provided Storage (ft)	1,120	1,120	2,050	1,013	1,320	972
Difference (ft)	-504	-475	1,557	462	856	421

Source: Traffic Operations Analysis Report, 2019
Grey highlighted cells represent insufficient ramp metering storage

Industrial Parkway West Interchange

Build Alternative 1 (Tight Diamond Configuration) for the I-880/Industrial Parkway West Interchange is proposed to have two diagonal on-ramps with one accessing northbound I-880 and one accessing southbound I-880. Build Alternative 2 (Hybrid Partial Cloverleaf/Tight Diamond Configuration) is proposed to have three on-ramps including a loop and a diagonal to southbound I-880 and a single northbound I-880 diagonal on-ramp. Build Alternative 3 will have one diagonal on-ramp for northbound I-880 and one loop on-ramp for southbound I-880.

The ramp storage calculation for Build Alternative 1 are shown in Table 2.1.5-21 and Table 2.1.5-22 for the AM and PM peak hours, respectively. Under Build Alternative 1, there is sufficient storage to meet the Caltrans requirements of the Design Manual at the southbound diagonal on-ramp in the AM and PM peak hours, but the northbound diagonal on-ramp does not provide enough storage in the PM peak hour. Table 2.1.5-23 and Table 2.1.5-24 show the same calculations for Build Alternative 2 in the AM and PM peak hours, respectively. This Build Alternative provides sufficient storage in 2025 for both the AM and PM peak hours. Finally, Table 2.1.5-25 and Table 2.1.5-26 present the ramp storage calculations for Build Alternative 3. As shown in Table 2.1.5-26, the southbound loop on-ramp is not projected to have sufficient storage to meet the Caltrans requirements in the Design Manual.

Table 2.1.5-21 2025 AM Ramp Storage at Industrial Parkway West Interchange
(Build Alternative 1)

	Industrial SB Diagonal		Industrial NB Diagonal	
	No-Build	Build Alt 1	No-Build	Build Alt 1
Demand	N/A	490	568	618
HOV %		20%	14%	20%
Demand to Store		27	34	35
Required Storage (ft)		783	986	1,015
Provided Storage (ft)		1,331	900	1,230
Difference (ft)		N/A	548	-86

Source: Traffic Operations Analysis Report, 2019
 Grey highlighted cells represent insufficient ramp metering storage
 N/A = Not Applicable

Table 2.1.5-22 2025 PM Ramp Storage at Industrial Parkway West Interchange (Build Alternative 1)

	Industrial SB Diagonal		Industrial NB Diagonal	
	No-Build	Build Alt 1	No-Build	Build Alt 1
Demand	N/A	610	714	729
HOV %		7%	13%	13%
Demand to Store		40	43	44
Required Storage (ft)		1,160	1,247	1,276
Provided Storage (ft)		1,331	900	1,230
Difference (ft)	N/A	171	-347	-46

Source: Traffic Operations Analysis Report, 2019
Grey highlighted cells represent insufficient ramp metering storage
N/A = Not Applicable

Table 2.1.5-23 2025 AM Ramp Storage at Industrial Parkway West Interchange (Build Alternative 2)

	Industrial SB Loop		Industrial SB Diagonal		Industrial NB Diagonal	
	No-Build	Build Alt 2	No-Build	Build Alt 2	No-Build	Build Alt 2
Demand	513	316	N/A	174	568	618
HOV %	19%	20%		20%	14%	20%
Demand to Store	29	18		10	34	35
Required Storage (ft)	841	522		290	986	1,015
Provided Storage (ft)	795	790		700	900	1,335
Difference (ft)	-46	268	N/A	410	-86	320

Source: Traffic Operations Analysis Report, 2019
Grey highlighted cells represent insufficient ramp metering storage
N/A = Not Applicable

Table 2.1.5-24 2025 PM Ramp Storage at Industrial Parkway West Interchange (Build Alternative 2)

	Industrial SB Loop		Industrial SB Diagonal		Industrial NB Diagonal	
	No-Build	Build Alt 2	No-Build	Build Alt 2	No-Build	Build Alt 2
Demand	602	265	N/A	345	714	729
HOV %	7%	7%		7%	13%	13%
Demand to Store	39	17		22	43	44
Required Storage (ft)	1,131	493		638	1,247	1,276
Provided Storage (ft)	795	790		700	900	1,335
Difference (ft)	-336	297	N/A	62	-347	59

Source: Traffic Operations Analysis Report, 2019
 Grey highlighted cells represent insufficient ramp metering storage
 N/A = Not Applicable

Table 2.1.5-25 2025 AM Ramp Storage at Industrial Parkway West Interchange (Build Alternative 3)

	Industrial NB Diagonal		Industrial SB Loop	
	No-Build	Build Alt 3	No-Build	Build Alt 3
Demand	568	618	513	490
HOV %	14%	20%	19%	20%
Demand to Store	34	35	29	27
Required Storage (ft)	986	1,015	841	783
Provided Storage (ft)	900	1,395	795	985
Difference (ft)	-86	380	-46	202

Source: Traffic Operations Analysis Report, 2019
 Grey highlighted cells represent insufficient ramp metering storage
 N/A = Not Applicable

Table 2.1.5-26 2025 PM Ramp Storage at Industrial Parkway West Interchange (Build Alternative 3)

	Industrial NB Diagonal		Industrial SB Loop	
	No-Build	Build Alt 3	No-Build	Build Alt 3
Demand	714	729	602	610
HOV %	13%	13%	7%	7%
Demand to Store	43	44	39	40
Required Storage (ft)	1,247	1,276	1,131	1,160
Provided Storage (ft)	900	1,395	795	985
Difference (ft)	-347	119	-336	-175

Source: Traffic Operations Analysis Report, 2019
 Grey highlighted cells represent insufficient ramp metering storage
 N/A = Not Applicable

2045 Traffic Operations

Freeway Analysis

The year 2045 freeway operations uses a similar approach to the 2025 analysis. Locations that were not congested under existing conditions and were reanalyzed using HCM 6 methodologies or the Leisch Nomographs with the updated traffic volumes corresponding to 2045 conditions. At the six freeway segments that were congested under existing conditions, the 2045 analysis applied the speed differential from the travel demand model between existing and 2045 conditions to report the new travel speed. The resulting freeway operations for the Build Alternatives are shown in Table 2.1.5-27 and Table 2.1.5-28 for the AM and PM peak hour, respectively. As shown in these two tables, the freeway mainline is not significantly affected and would have the same LOS for the No-Build Alternative and the Build Alternatives.

The segment that shows the most change is I-880 Northbound between Whipple Road and Industrial Parkway West. This is because the Build Alternatives would construct a new northbound off-ramp at Industrial Parkway West, causing traffic that currently exits the freeway at Whipple Road under the No-Build Alternative to remain on the freeway for one more segment in order to use the new off-ramp.

Table 2.1.5-27 2045 AM Peak Hour I-880 Freeway Operations

AM Peak Hour (7:45 - 8:45 AM)							
ID	Segment	Direction	Method	2045 No-Build Alternative		2045 Build Alternatives ¹	
				Density	LOS	Density	LOS
1	Alvarado-Niles Road to Whipple Road	NB	HCM 6	24.4	C	24.7	C
2	Whipple Road to Industrial Parkway West	NB	HCM 6	27.3	D	30.4	D
3	Industrial Parkway to Tennyson Road	NB	HCM 6	22.9	C	21.9	C
4	Tennyson Road to Industrial Parkway West	SB	Field Data	76.4	F	76.0	F
5	Industrial Parkway to Whipple Road	SB	Field Data	92.6	F	91.5	F
6	Whipple Road to Alvarado-Niles Road	SB	Field Data	84.5	F	83.2	F

Source: Traffic Operations Analysis Report, 2019

¹ Freeway mainline operations are the same for Build 1 and Build 2 Alternatives

LOS = Level of Service

Table 2.1.5-28 2045 PM Peak Hour I-880 Freeway Operations

PM Peak Hour (5:00 - 6:00 PM)							
ID	Segment	Direction	Method	2045 No-Build Alternative		2045 Build Alternatives ¹	
				Density	LOS	Density	LOS
1	Alvarado-Niles Road to Whipple Road	NB	Field Data	95.6	F	97.5	F
2	Whipple Road to Industrial Parkway West	NB	Field Data	105.2	F	109.5	F
3	Industrial Parkway West to Tennyson Road	NB	Field Data	81.1	F	79.3	F
4	Tennyson Road to Industrial Parkway West	SB	HCM 6	36.7	E	36.7	E
5	Industrial Parkway West to Whipple Road	SB	HCM 6	N/A	F	N/A	F
6	Whipple Road to Alvarado-Niles Road	SB	Leisch	N/A	F	N/A	F

Source: Traffic Operations Analysis Report, 2019

¹ Freeway mainline operations are the same for Build 1 and Build 2 Alternatives

LOS = Level of Service; N/A = Not Applicable

Intersection Analysis

The year 2045 intersection operations based on projected weekday AM and PM peak hour traffic volumes for the No-Build Alternative condition and for each of the Build Alternatives. Details of the intersection analysis are provided in the TOAR.

Whipple Road-Industrial Parkway Southwest Interchange

Whipple Road Interchange improvements are proposed in Build Alternative 1 and in a Design Variation for Build Alternative 1 as shown in the plans located in the TOAR. Build Alternative 1 would replace the three existing I-880/Whipple Road undercrossing structures with one undercrossing structure and improve bicycle and pedestrian facilities across the interchange along Whipple Road. Design Variation 1 of Build Alternative 1 would preserve the three existing Whipple Road Undercrossing structures and make improvements to the interchange and local roads within the constraints of the existing structures.

The TOAR evaluated the 2045 intersection operations for Build Alternative 1 against the 2045 No-Build Alternative for the AM and PM I-880/Whipple Road-Industrial Parkway Southwest Interchange peak hours. Intersection operations would improve at both ramp terminal intersections as a result of Build Alternative 1. All study intersections operate at the LOS E standard or better with a V/C ratio of 0.96 or better. Compared to Design Variation 1 described later, Build Alternative 1 would operate similarly with the main differences in delay attributable to variations in signal timing rather than one option being geometrically superior to another from an operations perspective.

The TOAR evaluated the 2045 intersection operations for Design Variation 1 against the 2045 No-Build Alternative for the AM 2.1.5-29 and PM 2.1.5-30 peak hours. Intersection operations would improve at both ramp terminal intersections as a result of Design Variation 1. All study intersections are forecast to operate at the LOS E standard or better with a V/C ratio of 0.96 or less.

Table 2.1.5-29 2045 AM Peak Hour Operations at Whipple Road Interchange

Intersection Name	Control Type	LOS Standard	2045 No-Build Alternative			2045 + Build Alternative 1			2045 + Design Variation 1		
			V/C	Delay (s/veh)	LOS	V/C	Delay (s/veh)	LOS	V/C	Delay (s/veh)	LOS
I-880 SB Ramps/Dyer Street & Whipple Road	Signalized	E	1.13	112.0	F	0.91	52.2	D	0.90	50.4	D
I-880 NB Ramps & Whipple Road	Signalized	E	1.31	116.0	F	0.96	64.8	E	0.96	65.7	E

Source: Traffic Operations Analysis Report, 2019

LOS = Level of Service; V/C = Volume to Capacity; s/veh = vehicle delay per second

Table 2.1.5-30 2045 PM Peak Hour Operations at Whipple Road Interchange

Intersection Name	Control Type	LOS Standard	2045 No-Build Alternative			2045 + Build Alternative 1			2045 + Design Variation 1		
			V/C	Delay (s/veh)	LOS	V/C	Delay (s/veh)	LOS	V/C	Delay (s/veh)	LOS
I-880 SB Ramps/Dyer Street & Whipple Road	Signalized	E	1.21	107.2	F	0.86	57.9	E	0.86	54.0	D
I-880 NB Ramps & Whipple Road	Signalized	E	1.16	108.5	F	0.86	52.1	D	0.92	55.8	E

Source: Traffic Operations Analysis Report, 2019

LOS = Level of Service; V/C = Volume to Capacity; s/veh = vehicle delay per second

Industrial Parkway West Interchange

The Industrial Parkway West Interchange improvements are proposed in Build Alternative 1, Build Alternative 2, and Build Alternative 3 as shown in the plans located in the TOAR. All three Build Alternatives would replace the existing I-880/Industrial Parkway West overcrossing structure and reconfigure the northbound I-880 ramps. Build Alternative 1 would reconfigure the southbound ramps into a tight diamond configuration removing the existing loop on-ramp. Build Alternative 2 would add a new diagonal southbound on-ramp but preserve the southbound loop on-ramp. Build Alternative 3 would widen the existing southbound diagonal off-ramp and loop on-ramp but not construct the southbound diagonal on-ramp.

The TOAR evaluated the 2045 intersection operations for the three Build Alternatives against the 2045 No-Build Alternative for the AM 2.1.5-31 and PM 2.1.5-32 peak hours. Intersection operations would improve under all three of the Build Alternatives with the two ramp terminal intersections operating at LOS D or better with a V/C ratio of 0.95 or less.

Similar to the 2025 findings, Build Alternative 2 would have the lowest average intersection delay per vehicle of the three Build Alternatives due to not needing a protected left turn signal phase to access the freeway. This reduces the number of signal phases at the southbound ramp terminal intersection providing additional capacity for the through movements. The delay differences between Build Alternative 1 and Build Alternative 3 at the two ramp terminal intersections are minimal.

All three of the Build Alternatives would operate at LOS D or better in 2045 exceeding the LOS E standard.

Table 2.1.5-31 2045 AM Peak Hour Operations at Industrial Parkway West Interchange

Intersection Name	Control Type	LOS Standard	2045 No-Build Alternative			2045 + Build Alternative 1			2045 + Build Alternative 2			2045 + Build Alternative 3		
			V/C	Delay (s/veh)	LOS	V/C	Delay (s/veh)	LOS	V/C	Delay (s/veh)	LOS	V/C	Delay (s/veh)	LOS
I-880 SB Ramps & Industrial Parkway West	Signalized	E	1.16	147.4	F	0.90	32.3	C	0.92	27.6	C	0.82	28.2	C
I-880 NB Ramps & Industrial Parkway West	TWSC ¹ / Signalized	E	1.02	141.0	F	0.95	35.3	D	0.91	20.7	C	0.81	31.9	C

Source: Traffic Operations Analysis Report, 2019

¹ TWSC = Two-Way Stop Controlled. No Project, Signalized under Plus Project

LOS = Level of Service; V/C = Volume to Capacity; s/veh = vehicle delay per second

Table 2.1.5-32 2045 PM Peak Hour Operations at Industrial Parkway West Interchange

Intersection Name	Control Type	LOS Standard	2045 No-Build Alternative			2045 + Build Alternative 1			2045 + Build Alternative 2			2045 + Build Alternative 3		
			V/C	Delay (s/veh)	LOS	V/C	Delay (s/veh)	LOS	V/C	Delay (s/veh)	LOS	V/C	Delay (s/veh)	LOS
I-880 SB Ramps & Industrial Parkway West	Signalized	E	1.07	84.2	F	0.80	27.0	C	0.56	12.3	B	0.65	24.7	C
I-880 NB Ramps & Industrial Parkway West	TWSC ¹ / Signalized	E	0.67	25.7	D	0.64	16.4	B	0.66	14.3	B	0.63	22.1	C

Source: Traffic Operations Analysis Report, 2019

¹ TWSC = Two-Way Stop Controlled. (TWSC) No Project, Signalized under Plus Project

LOS = Level of Service; V/C = Volume to Capacity; s/veh = vehicle delay per second

Queue Analysis

The TOAR evaluated the maximum (95th percentile probability) queues on individual intersection approaches using the HCM 6 methodologies as implemented by VISTRO. The average length per vehicle was assumed to be 25 feet. The VISTRO reports containing these queue lengths are provided in the TOAR.

Whipple Road-Industrial Parkway Southwest Interchange

The 95th percentile queue lengths in vehicles for 2045 conditions are shown in Table 2.1.5-33, and Table 2.1.5-34 for Build Alternative 1 and Design Variation 1, respectively. A summary of where the two options would cause the queue to exceed the available storage or where the options would cause a queue already exceeding storage under the No Project condition to increase include:

- Build Alternative 1
 - I-880 SB Ramps & Industrial Parkway West
 - SBR – Would exceed the available storage by one vehicle in the AM peak hour as a result of Build Alternative 1. The queue is not anticipated to interfere with mainline freeway operations.
 - WBL – Would exceed the available storage by seven vehicles in the AM peak hour and three vehicles in the PM peak hour as a result of Build Alternative 1. This may affect the operations of the northbound ramp terminal on Industrial Parkway West.
 - I-880 NB Ramps & Industrial Parkway West
 - EBL – Build Alternative 1 would cause this movement to exceed the available storage by six vehicles in the PM peak hour.
- Build Alternative 2
 - I-880 SB Ramps & Industrial Parkway West
 - WBT – Would exceed the available storage by seven vehicles for Build Alternative 2, potentially causing a queue that could interrupt traffic operations at the northbound ramp terminal intersection at Industrial Parkway West.

- I-880 NB Ramps & Industrial Parkway West
 - Build Alternative 2 would not cause a queue to exceed storage or result in a queue already exceeding storage under the No-Build Alternative to increase at the northbound ramp terminal intersection.
- Build Alternative 3
 - I-880 SB Ramps & Industrial Parkway West
 - WBT – Would exceed the available storage by eleven vehicles for Build Alternative 3, potentially causing a queue that could interrupt traffic operations at the northbound ramp terminal intersection at Industrial Parkway West.
 - I-880 NB Ramps & Industrial Parkway
 - WBR – Would exceed the available storage by two vehicles for Build Alternative 3, potentially causing a queue that could disrupt westbound through trips in the lane closest to the westbound right turn lane at the northbound ramp terminal intersection.

Table 2.1.5-33 2045 95th Percentile Queue Length (Vehicles) at Whipple Road Interchange (Build Alternative 1)

Intersection Name	Scenario	Northbound			Southbound			Eastbound			Westbound		
		Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
I-880 SB Ramps/Dyer Street & Whipple Road	Storage NBA	6	19	19	11	43	16	87	87	12	27	27	N/A
	AM NBA	11	19	2	9	14	93	25	25	20	10	12	N/A
	PM NBA	12	20	6	11	15	88	30	29	31	11	10	N/A
	Storage BA1	6	19	19	10	43	8	87	87	12	27	27	N/A
	AM BA1	11	20	2	12	11	2	26	26	20	15	15	N/A
	PM BA1	17	22	6	15	11	8	28	28	31	13	11	N/A
I-880 NB Ramps & Whipple Road	Storage NBA	15	48	17	54	N/A	54	11	42	N/A	N/A	15	9
	AM NBA	21	51	53	62	N/A	11	19	27	N/A	N/A	13	21
	PM NBA	10	43	17	21	N/A	8	20	14	N/A	N/A	43	23
	Storage BA1	12	48	8	54	N/A	54	42	42	N/A	N/A	15	9
	AM BA1	22	10	16	14	N/A	36	18	27	N/A	N/A	15	15
	PM BA1	10	20	4	10	N/A	24	23	8	N/A	N/A	22	19

Source: Traffic Operations Analysis Report, 2019

Grey highlighted cells represent movements that have a 95th percentile queue longer than the available storage.

NBA = No-Build Alternative; BA1 = Build Alternative 1; N/A = Not Applicable

Table 2.1.5-34 2045 95th Percentile Queue Length (Vehicles) at Whipple Road Interchange (Design Variation 1)

Intersection Name	Scenario	Northbound			Southbound			Eastbound			Westbound		
		Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
I-880 SB Ramps/Dyer Street & Whipple Road	Storage NBA	6	19	19	11	43	16	87	87	12	27	27	N/A
	AM NBA	11	19	2	9	14	93	25	25	20	10	12	N/A
	PM NBA	12	20	6	11	15	88	30	29	31	11	10	N/A
	Storage DV1	6	19	19	11	43	16	87	87	12	27	27	N/A
	AM DV1	11	21	2	12	17	2	24	24	19	15	16	N/A
	PM DV1	15	23	6	15	17	9	27	27	30	13	11	N/A
I-880 NB Ramps & Whipple Road	Storage NBA	15	48	17	54	N/A	54	11	42	N/A	N/A	15	9
	AM NBA	21	51	53	62	N/A	11	19	27	N/A	N/A	13	21
	PM NBA	10	43	17	21	N/A	8	20	14	N/A	N/A	43	23
	Storage DV1	11	48	14	54	N/A	54	42	42	N/A	N/A	15	9
	AM DV1	23	10	16	14	N/A	36	18	26	N/A	N/A	16	15
	PM DV1	10	20	4	10	N/A	26	22	7	N/A	N/A	26	19

Source: Traffic Operations Analysis Report, 2019

Grey highlighted cells represent movements that have a 95th percentile queue longer than the available storage.

NBA = No-Build Alternative; DV1 = Design Variation 1; N/A = Not Applicable

Table 2.1.5-35 2045 95th Percentile Queue Length (Vehicles) at Industrial Parkway West Interchange (Build Alternative 1)

Intersection Name	Scenario	Northbound			Southbound			Eastbound			Westbound		
		Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
I-880 SB Ramps & Industrial Parkway	Storage NBA	N/A	N/A	N/A	42	N/A	N/A	15	100	N/A	N/A	31	7
	AM NBA	N/A	N/A	N/A	40	N/A	N/A	7	7	N/A	N/A	81	11
	PM NBA	N/A	N/A	N/A	70	N/A	N/A	14	12	N/A	N/A	16	9
	Storage BA1	N/A	N/A	N/A	40	N/A	21	N/A	27	27	12	12	N/A
	AM BA1	N/A	N/A	N/A	12	N/A	22	N/A	17	9	19	19	N/A
	PM BA1	N/A	N/A	N/A	15	N/A	15	N/A	21	10	15	4	N/A
I-880 NB Ramps & Industrial Parkway	Storage NBA	N/A	N/A	N/A	N/A	N/A	N/A	11	31	N/A	N/A	25	N/A
	AM NBA	N/A	N/A	N/A	N/A	N/A	N/A	8	0	N/A	N/A	0	N/A
	PM NBA	N/A	N/A	N/A	N/A	N/A	N/A	5	0	N/A	N/A	0	N/A
	Storage BA1	52	N/A	52	N/A	N/A	N/A	11	14	N/A	N/A	44	18
	AM BA1	19	N/A	6	N/A	N/A	N/A	10	3	N/A	N/A	26	11
	PM BA1	9	N/A	9	N/A	N/A	N/A	17	1	N/A	N/A	8	9

Source: Traffic Operations Analysis Report, 2019

Grey highlighted cells represent movements that have a 95th percentile queue longer than the available storage.

NBA = No-Build Alternative; BA1 = Build Alternative 1; N/A = Not Applicable

Table 2.1.5-36 2045 95th Percentile Queue Length (Vehicles) at Industrial Parkway West Interchange (Build Alternative 2)

Intersection Name	Scenario	Northbound			Southbound			Eastbound			Westbound		
		Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
I-880 SB Ramps & Industrial Parkway	Storage NBA	N/A	N/A	N/A	42	N/A	N/A	15	100	N/A	N/A	31	7
	AM NBA	N/A	N/A	N/A	40	N/A	N/A	7	7	N/A	N/A	81	11
	PM NBA	N/A	N/A	N/A	70	N/A	N/A	14	12	N/A	N/A	16	9
	Storage BA2	N/A	N/A	N/A	40	N/A	20	N/A	21	8	N/A	16	7
	AM BA2	N/A	N/A	N/A	10	N/A	18	N/A	4	3	N/A	23	6
	PM BA2	N/A	N/A	N/A	11	N/A	11	N/A	5	5	N/A	5	3
I-880 NB Ramps & Industrial Parkway	Storage NBA	N/A	N/A	N/A	N/A	N/A	N/A	11	31	N/A	N/A	25	N/A
	AM NBA	N/A	N/A	N/A	N/A	N/A	N/A	8	0	N/A	N/A	0	N/A
	PM NBA	N/A	N/A	N/A	N/A	N/A	N/A	5	0	N/A	N/A	0	N/A
	Storage BA2	52	N/A	52	N/A	N/A	N/A	16	18	N/A	N/A	44	18
	AM BA2	14	N/A	4	N/A	N/A	N/A	7	3	N/A	N/A	16	9
	PM BA2	6	N/A	7	N/A	N/A	N/A	12	2	N/A	N/A	8	9

Source: Traffic Operations Analysis Report, 2019

Grey highlighted cells represent movements that have a 95th percentile queue longer than the available storage.

NBA = No-Build Alternative; BA2 = Build Alternative 2; N/A = Not Applicable

Ramp Meter Storage Analysis

Chapter 1, Section 4 of the Design Manual stipulates there should be sufficient storage behind the ramp meter limit line to accommodate a queue that is equal to 7 percent of the peak hour demand for the general-purpose lanes. HOV volumes may be removed from the analysis as they are provided with an HOV bypass lane. HOV volumes were estimated based on the percent of HOV vehicles in the traffic forecasting model. Using the 2045 forecast ramp demand volumes, the 7 percent storage requirement, estimated HOV percentages, and assuming 29 feet of spacing per queued vehicle, this section compares the provided storage with the Design Manual requirements for 2045. This section also documents the projected minimum metering rate that would be required to prevent the ramp metering queue from extending into the adjacent intersection.

Whipple Road Interchange

The Whipple Road interchange has three on-ramps including the southbound I-880 diagonal on-ramp, the northbound I-880 loop on-ramp, and the northbound I-880 diagonal on-ramp. The primary difference between Build Alternative 1 and Design Variation 1 for ramp metering storage is that Build Alternative 1 will have a separate metering light for the northbound I-880 loop ramp and diagonal ramp. Design Variation 1 will maintain the current configuration where both the northbound loop ramp and diagonal ramp are metered at the same location.

The resulting calculations for ramp storage at the Whipple Road Interchange in 2045 for the AM and PM peak hours for Build Alternative 1 are shown in Table 2.1.5-37 and Table 2.1.5-38, respectively. The same information for Design Variation 1 is shown in Table 2.1.5-39 (AM Peak Hour) and Table 2.1.5-40 (PM Peak Hour).

The findings for both Build Alternatives are similar and indicate that the southbound diagonal on-ramp will not have sufficient storage to meet the Caltrans ramp metering storage guidance set forth in the Design Manual under No Build, Build Alternative 1, or Design Variation 1 conditions. The PM peak hour is short the required length by up to 823 feet.

Table 2.1.5-37 2045 AM Ramp Storage at Whipple Road Interchange
(Build Alternative 1)

	Whipple SB Diagonal		Whipple NB Loop		Whipple NB Diagonal	
	No Build	Build Alt 1	No Build	Build Alt 1	No Build	Build Alt 1
Demand	652	677	294	282	275	296
HOV %	17%	18%	23%	0%	22%	0%
Demand to Store	38	39	16	20	15	21
Required Storage (ft)	1,102	1,131	464	580	435	609
Provided Storage (ft)	1,120	1,120	2,050	1,724	1,320	945
Difference (ft)	18	-11	1,586	1,144	885	336

Source: Traffic Operations Analysis Report, 2019
Grey highlighted cells represent insufficient ramp metering storage

Table 2.1.5-38 2045 PM Ramp Storage at Whipple Road Interchange
(Build Alternative 1)

	Whipple SB Diagonal		Whipple NB Loop		Whipple NB Diagonal	
	No Build	Build Alt 1	No Build	Build Alt 1	No Build	Build Alt 1
Demand	1,092	1,122	276	283	315	307
HOV %	15%	15%	11%	0%	10%	0%
Demand to Store	65	67	17	20	20	21
Required Storage (ft)	1,885	1,943	493	580	580	609
Provided Storage (ft)	1,120	1,120	2,050	1,724	1,320	945
Difference (ft)	-765	-823	1,557	1,144	740	336

Source: Traffic Operations Analysis Report, 2019
Grey highlighted cells represent insufficient ramp metering storage

Table 2.1.5-39 2045 AM Ramp Storage at Whipple Road Interchange
(Design Variation 1)

	Whipple SB Diagonal					
Demand	652	677	294	282	275	296
HOV %	17%	18%	23%	0%	22%	0%
Demand to Store	38	39	16	20	15	21
Required Storage (ft)	1,102	1,131	464	580	435	609
Provided Storage (ft)	1,120	1,120	2,050	1,013	1,320	972
Difference (ft)	18		1,586	433	885	363

Source: Traffic Operations Analysis Report, 2019
Grey highlighted cells represent insufficient ramp metering storage

Table 2.1.5-40 2045 PM Ramp Storage at Whipple Road Interchange
(Design Variation 1)

	Whipple SB Diagonal		Whipple NB Loop		Whipple NB Diagonal	
	No Build	Design Var 1	No Build	Design Var 1	No Build	Design Var 1
Demand	1,092	1,122	276	283	315	307
HOV %	15%	15%	11%	0%	10%	0%
Demand to Store	65	67	17	20	20	21
Required Storage (ft)	1,885	1,943	493	580	580	609
Provided Storage (ft)	1,120	1,120	2,050	1,013	1,320	972
Difference (ft)	-765	-823	1,557	433	740	363

Source: Traffic Operations Analysis Report, 2019
Grey highlighted cells represent insufficient ramp metering storage

Industrial Parkway West Interchange

Build Alternative 1 for the Industrial Parkway West Interchange is proposed to have two diagonal on-ramps with one accessing northbound I-880 and one accessing southbound I-880. Build Alternative 2 is proposed to have three on-ramps including a loop and a diagonal to southbound I-880 and a single northbound I-880 diagonal on-ramp. Build Alternative 3 will have one diagonal on-ramp for northbound I-880 and one loop on-ramp for southbound I-880.

The ramp storage calculation for Build Alternative 1 are shown in Table 2.1.5-41 and Table 2.1.5-42 for the AM and PM peak hours, respectively. Under Build Alternative 1, the northbound diagonal on-ramp is anticipated to be about 133 feet (five vehicle lengths) short in the PM peak hour of meeting the Caltrans guidelines specified in the Design Manual. The southbound diagonal on-ramp was found to provide sufficient storage in 2045.

Table 2.1.5-43 and Table 2.1.5-44 show the same calculations for Build Alternative 2 in the AM and PM peak hours, respectively. Similar to Build Alternative 1, only the northbound diagonal on-ramp is anticipated to have a storage demand exceeding the available storage in the PM peak hour by about one vehicle. The other on-ramps provide sufficient storage.

Build Alternative 3 calculations (Table 2.1.5-45 and Table 2.1.5-46) show the southbound loop on-ramp is anticipated to exceed the available storage in the PM peak hour by about 150 feet.

Table 2.1.5-41 2045 AM Ramp Storage at Industrial Parkway West Interchange
(Build Alternative 1)

	Industrial SB Diagonal		Industrial NB Diagonal	
	No Build	Build Alt 1	No Build	Build Alt 1
Demand	N/A	552	568	618
HOV %		18%	20%	21%
Demand to Store		32	32	34

	Industrial SB Diagonal		Industrial NB Diagonal	
	No Build	Build Alt 1	No Build	Build Alt 1
Required Storage (ft)		928	928	986
Provided Storage (ft)		1,331	900	1,230
Difference (ft)	N/A	403	-28	244

Source: Traffic Operations Analysis Report, 2019
 Grey highlighted cells represent insufficient ramp metering storage
 N/A = Not Applicable

Table 2.1.5-42 2045 PM Ramp Storage at Industrial Parkway West Interchange (Build Alternative 1)

	Industrial SB Diagonal		Industrial NB Diagonal	
	No Build	Build Alt 1	No Build	Build Alt 1
Demand		641	748	755
HOV %		12%	10%	11%
Demand to Store	N/A	39	47	47
Required Storage (ft)		1,131	1,363	1,363
Provided Storage (ft)		1,331	900	1,230
Difference (ft)	N/A	200	-463	-133

Source: Traffic Operations Analysis Report, 2019
 Grey highlighted cells represent insufficient ramp metering storage
 N/A = Not Applicable

Table 2.1.5-43 2045 AM Ramp Storage at Industrial Parkway West Interchange (Build Alternative 2)

	Industrial SB Loop		Industrial SB Diagonal		Industrial NB Diagonal	
	No Build	Build Alt 2	No Build	Build Alt 2	No Build	Build Alt 2
Demand	549	357	N/A	195	568	618
HOV %	19%	18%		18%	20%	21%
Demand to Store	31	20		11	32	34
Required Storage (ft)	899	580		319	928	986
Provided Storage (ft)	795	790		700	900	1,335
Difference (ft)	-104	210	N/A	381	-28	349

Source: Traffic Operations Analysis Report, 2019

Grey highlighted cells represent insufficient ramp metering storage

N/A = Not Applicable

Table 2.1.5-44 2045 PM Ramp Storage at Industrial Parkway West Interchange (Build Alternative 2)

	Industrial SB Loop		Industrial SB Diagonal		Industrial NB Diagonal	
	No Build	Build Alt 2	No Build	Build Alt 2	No Build	Build Alt 2
Demand	602	258	N/A	383	748	755
HOV %	12%	12%		12%	10%	11%
Demand to Store	37	16		24	47	47
Required Storage (ft)	1,073	464		696	1,363	1,363
Provided Storage (ft)	795	790		700	900	1,335
Difference (ft)	-278	326	N/A	4	-463	-28

Source: Traffic Operations Analysis Report, 2019

Grey highlighted cells represent insufficient ramp metering storage

N/A = Not Applicable

Table 2.1.5-45 2045 AM Ramp Storage at Industrial Parkway West Interchange
(Build Alternative 3)

	Industrial NB Diagonal		Industrial SB Loop	
	No-Build	Build Alt 2	No-Build	Build Alt 2
Demand	568	618	549	552
HOV %	20%	21%	19%	18%
Demand to Store	32	34	31	32
Required Storage (ft)	928	986	899	928
Provided Storage (ft)	900	1,395	795	985
Difference (ft)	-28	409	-104	57

Source: Traffic Operations Analysis Report, 2019
Grey highlighted cells represent insufficient ramp metering storage

Table 2.1.5-46 2045 PM Ramp Storage at Industrial Parkway West Interchange
(Build Alternative 3)

	Industrial NB Diagonal		Industrial SB Loop	
	No-Build	Build Alt 2	No-Build	Build Alt 2
Demand	748	755	602	641
HOV %	10%	11%	12%	12%
Demand to Store	47	47	37	39
Required Storage (ft)	1,363	1,363	1,073	1,131
Provided Storage (ft)	900	1,395	795	985
Difference (ft)	-463	32	-278	-146

Source: Traffic Operations Analysis Report, 2019
Grey highlighted cells represent insufficient ramp metering storage

Transit

Long term impacts of the proposed project on bus travel would generally be positive because of the reduction of delay and congestion at the study intersections. The project is not anticipated to require the modification of existing bus stops or routes.

Pedestrian and Bicycle

Each Build alternative would improve pedestrian and bicycle facilities within the study area with the addition of the following features:

- A Class I shared pedestrian and bicycle paths along both the north and south side of Whipple Road, between Dyer Street and Industrial Parkway Southwest
- New crosswalks spanning the north leg of the Whipple Road/I-880 southbound off-ramp intersection and at the south and west legs of the Whipple Road/Industrial Parkway Southwest intersection
- Sidewalk widening on westbound Whipple Road and southbound Industrial Parkway Southwest at the I-880/Whipple Road-Industrial Parkway Southwest interchange would be in compliance with ADA requirements.

Construction

Under the No Build Alternative, there would be no construction impacts to circulation and access, public or private parking, traffic operations, transit system and bicycle and pedestrian facilities.

During construction of the project, vehicular, bicycle and pedestrian circulation would be maintained in each direction (using detours and temporary signs, as required). Temporary lane and ramp closures would be required when low traffic volumes occur to construct specific items of work such as placement of temporary concrete barriers. Work would be conducted along the roadways, sidewalk, and pedestrian crossings. Implementation of Avoidance and Minimization Measure TRA-1, Prepare a Transportation Management Plan, would reduce temporary impacts on traffic, transit users, bicycles, and pedestrians to a less-than-significant level.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Measure TRA-1: A Transportation Management Plan (TMP) will be prepared to ensure efficient movement of local and regional traffic during construction. The TMP will provide for public outreach to inform community agencies, such as the fire department, and the public of the times and locations of upcoming construction, signage in and approaching the project area, and incident management for traffic control in the vicinity of construction activities.

Cumulative Impacts

Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of the project. A cumulative impact assessment looks at the collective impacts posed by individual land use plans and projects. Cumulative impacts can result from individually minor but collectively substantial impacts taking place over a long period of time.

The cumulative traffic analysis for the project is based on future traffic conditions in the year 2025 and 2045, which accounts for future traffic demand growth as a result of development in the project area. A detailed explanation of the traffic forecast methodology and land use assumptions applied is provided in the TOAR. Because of the nature of this analysis, which takes into account a cumulative year condition (2045), the cumulative impacts of the Build Alternatives are discussed fully under the 2045 Traffic Operations section.

As discussed above, the I-880 freeway mainline operations would not be adversely affected by the Build Alternatives, and would have the same LOS when compared to the No-Build Alternative. The queue and ramp meter storage analyses indicate mixed positive and negative results. However, intersection operations at the Whipple Road-Industrial Parkway Southwest Interchange and the Industrial Parkway West Interchange would improve compared to the 2045 No-Build Alternative.

Therefore, the project would not contribute to any potential cumulative impacts to the regional transportation network.

2.1.6 VISUAL/AESTHETICS

This section evaluates the project's effect on the visual environment. Information in this section is primarily drawn from the *Visual Impact Assessment* (VIA) prepared for the project. The visual impact study area is shown in Figure 2.1-4.

REGULATORY SETTING

Federal

NEPA of 1969, as amended, establishes that the federal government use all practicable means to ensure all Americans safe, healthful, productive, and *aesthetically* (emphasis added) and culturally pleasing surroundings (42 USC 4331[b][2]). To further emphasize this point, the Federal Highway Administration (FHWA), in its implementation of NEPA (23 USC 109[h]), directs that final decisions on projects are to be made in the best overall public interest taking into account adverse environmental impacts, including among others, the destruction or disruption of aesthetic values.

State

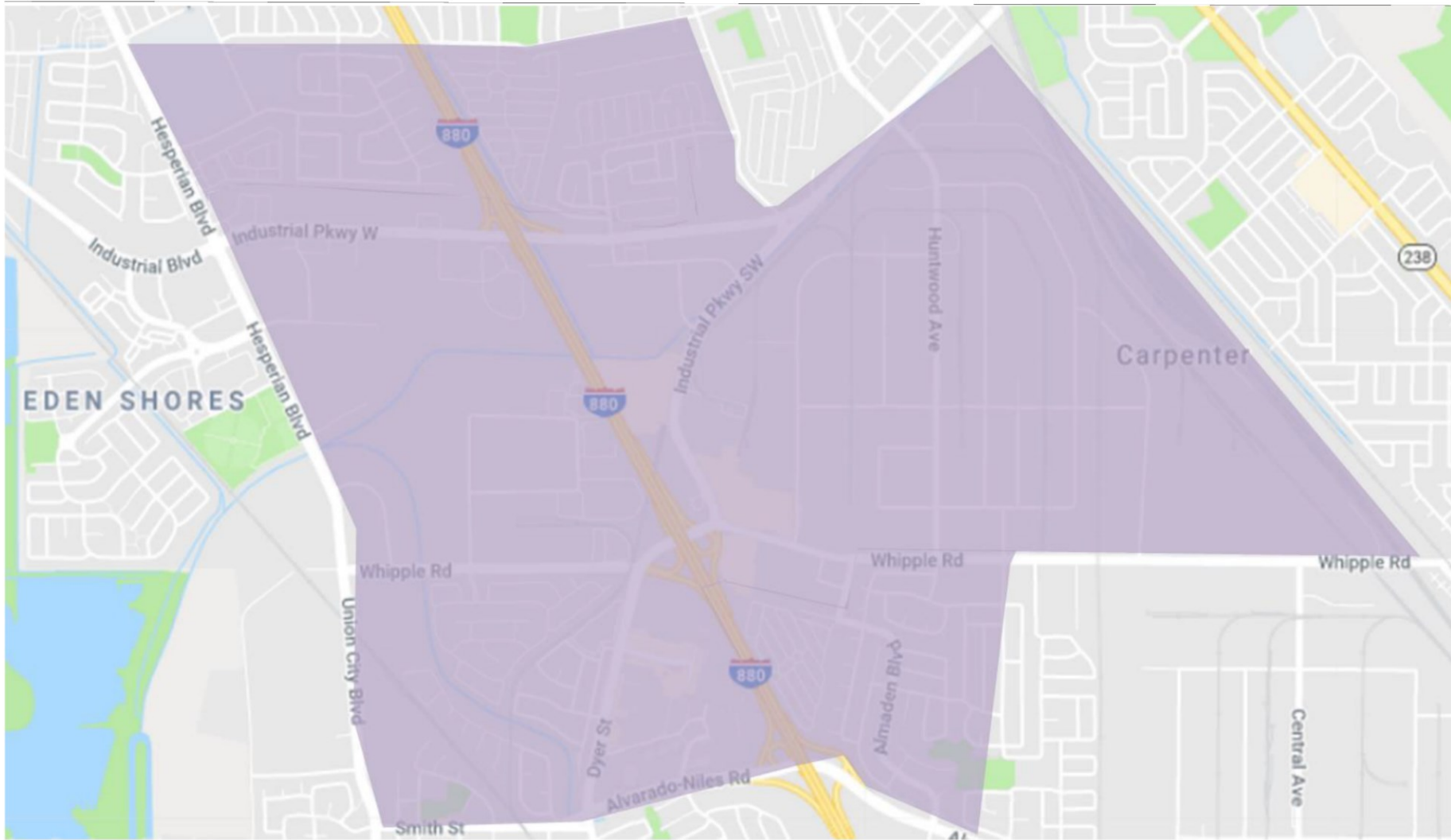
CEQA establishes that it is the policy of the state to take all action necessary to provide the people of the state "with...enjoyment of aesthetic, natural, scenic and historic environmental qualities" (CA Public Resources Code [PRC] Section 21001[b]).

State Scenic Highway Program

The Caltrans' Scenic Highway Program is intended to protect and enhance the natural scenic beauty of California's highways and adjacent corridors through special conservation treatment. The program protects against encroachment of incompatible land uses, mitigates and minimizes development activities along the corridor, prohibits billboards, and regulates grading activity. The four criteria used to determine whether a highway may be designated as scenic are as follows:

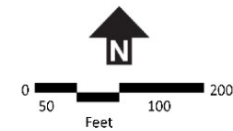
- The state or county highway consists of a scenic corridor composed of a memorable landscape that showcases the natural scenic beauty of agriculture in California.
- Its existing visual intrusions do not significantly impact the scenic corridor.
- It demonstrates strong local support for the proposed scenic highway designation.
- The length of the proposed scenic highway is not less than a mile and is not segmented.

I-880 Interchange Improvements (Whipple Road-Industrial Parkway Southwest and Industrial Parkway West) Project



Legend

- Visual Impact Area



Visual Impact Study Area

Figure

2.1-4

Visual intrusions are evaluated in the following manner:

- The more pristine the natural landscape is and less affected by intrusions, the more likely the nominated highway will qualify as scenic.
- Where intrusions have occurred, the less impact they have on an area's natural beauty, the more likely the nominated highway will qualify as scenic.
- The extent to which intrusions dominate views from the highway will determine the significance of their impact on the scenic corridor.

There are no officially designated state scenic highways or eligible highways within the visual impact study area.

Classified Landscaped Freeways

Caltrans-classified "Landscaped Freeways" are landscaped freeways with plantings that meet the State Outdoor Advertising Regulations criteria. These regulations are used in the control and regulation of outdoor advertising displays and are not an indication of an area that should be protected as a scenic corridor. Criteria for Landscaped Freeways include freeways with plantings within the state right-of-way that are continuous (no gaps greater than 200 feet), ornamental (not functional), at least 1000 feet long, on at least one side of the freeway, and require reasonable maintenance. Specific areas of the I-880 corridor have been declassified from their former designation as a Landscaped Freeway.¹⁶ However, most of the I-880 corridor is still classified as a Landscaped Freeway through the project limits.¹⁷

AFFECTED ENVIRONMENT

This section presents information regarding the character and quality of existing views within the visual study area (VSA), shown in Figure 2.1-5. Key viewpoints within the VSA were selected, photographed, and assessed in order to determine the current condition of scenic resources. Viewpoint locations are shown on Figure 2.1-5. The VSA encompasses residential neighborhoods west and east of I-880, and portions of Industrial Parkway West, Industrial Parkway Southwest, Whipple Road, and Dyer Street. Land uses within the VSA are primarily industrial and residential. Natural land cover in the VSA is limited to the vegetation along the flood control channel near the Industrial Parkway West Interchange, and trees and shrubs in the Whipple Road and Industrial Parkway West loop ramps.

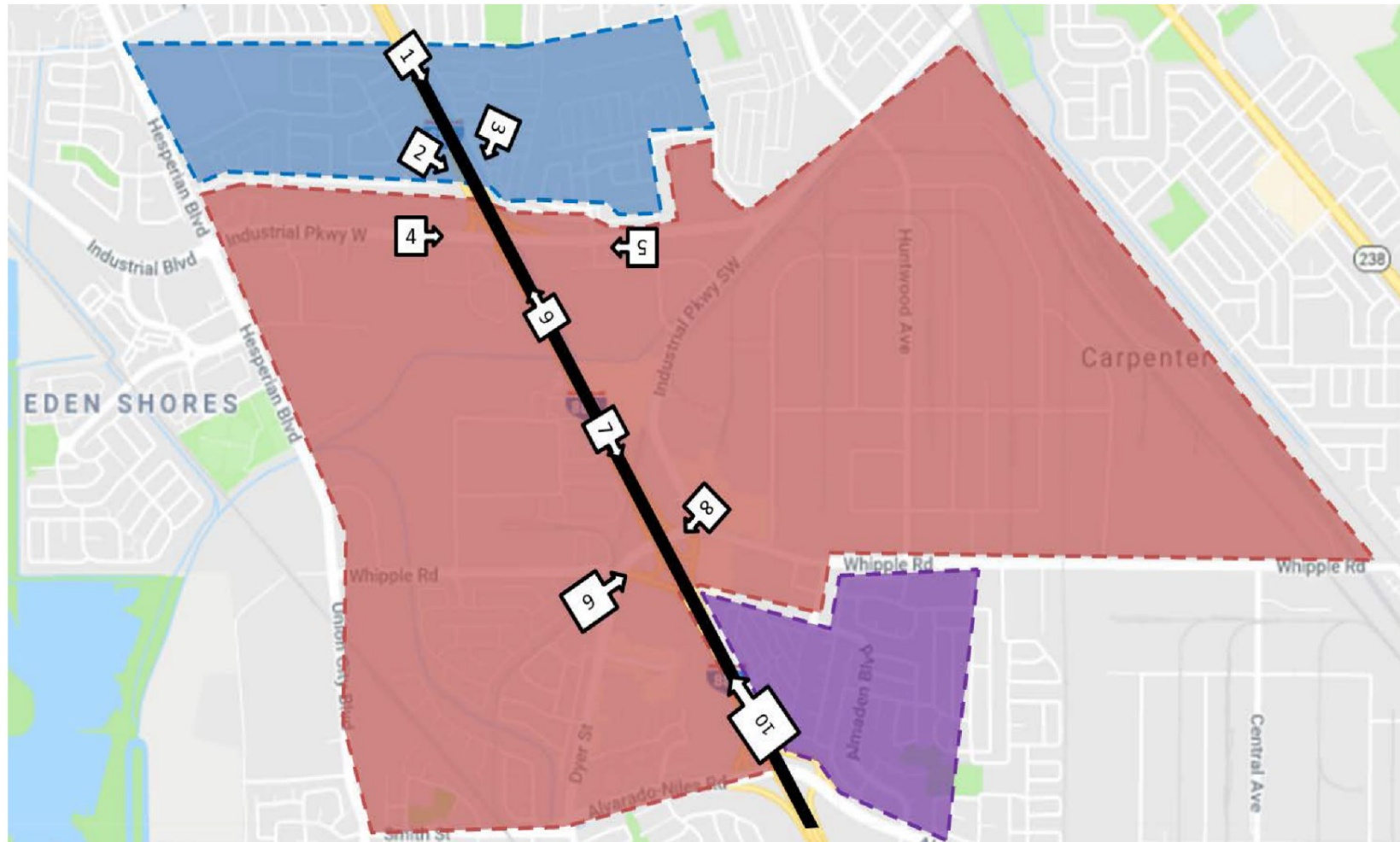
¹⁶ Caltrans, 2019. *Classified Landscaped Freeways Declassifications*.

http://www.dot.ca.gov/design/lap/livability/docs/ClassifiedLandscapedFreewaysDeclassifications_01312019.pdf. Accessed: September 2019.

¹⁷ Landscape freeway post miles that fall within the visual study area for the project include post miles 13.04 to 13.76, 13.54 to 13.77, 13.85 to 14.18, and 14.47 to 25.68.

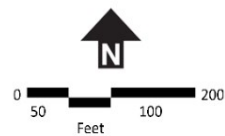
Visual Assessment Setting

The project corridor was divided into a series of *visual assessment units*. Each visual assessment unit has its own visual character and visual quality. The four visual assessment units identified for the project, and their associated key views, are discussed below and depicted in Figure 2.1-5. The four visual assessment units are Residential North, the I-880 Corridor, Commercial/Industrial Center, and Residential South.



Legend

- █ Visual Assessment Unit 1: Residential North
- █ Visual Assessment Unit 2: I- 880 Corridor
- █ Visual Assessment Unit 3: Commercial/Industrial Center
- █ Visual Assessment Unit 4: Residential South



Visual Assessment Units and Key Viewpoints

Source: Circlepoint, 2019

Because it is not feasible to analyze all the views in which the project would be seen, it is necessary to select a number of viewpoints associated with visual assessment units that would most clearly represent the study area's visual resources. Photos of these viewpoints are provided in this section to depict views of the project from different portions of the study area. Viewpoints also represent the viewer groups that have the highest potential to be affected by the project while considering exposure and sensitivity. In addition, these viewpoints are used to demonstrate the change in the study area's visual resources as a result of the project.

Visual Assessment Unit 1: Residential North

Visual Assessment Unit 1 encompasses the northern-most portion of the study area and represents the residential neighborhood north of Hayward's ITI Corridor which consists of low to medium density single-family homes; and the Eden Roc Mobile Home Park and the Georgian Manor Mobile Home Community of mobile homes, located east and west of the I-880 freeway corridor, respectively. Residents within this area do not have direct views of the I-880 freeway due to existing sound walls.

Viewpoint 2 is representative of existing views within Visual Assessment Unit 1. Additional viewpoints are described and depicted in the VIA.

Figure 2.1-6 Viewpoint 2: Candlewood Road (Existing Condition)



Source: Google Street View Imagery, 2018
Note: View from Candlewood Road, looking southwest

Visual Assessment Unit 2: I-880 Corridor

Visual Assessment Unit 2 is comprised of the I-880 travel lanes within the project limits. The unit is lined by sound walls, trees, shrubs, tall grasses, and bare soil/gravel. Sparsely developed hillsides are visible in the distance to the west, as southbound motorists travel south through the I-880 corridor. Sound walls run along the northbound and southbound outside travel lanes from Tennyson Road through the Industrial Parkway West interchange. The majority of the I-880 corridor is screened by vegetation or sound walls, except for the freeway segment between Industrial Parkway West and the Ward Creek crossing; and the areas immediately surrounding the I-880/Whipple Road-Industrial Parkway Southwest Interchange. Northbound and southbound motorists have similar views, but the Ward Creek crossing is more prominent along the western side of I-880.

Viewpoint 6 is representative of existing views within Visual Assessment Unit 2. Additional viewpoints are described and depicted in the VIA.

Figure 2.1-7 Viewpoint 6: Northbound I-880 (Existing Condition)



Source: Google Street View Imagery, 2018
Note: View from northbound I-880, looking north

Visual Assessment Unit 3: Commercial/Industrial Center

Visual Assessment Unit 3 represents Hayward's ITI Corridor, which consists of predominantly industrial and commercial land uses. The Visual Assessment Unit is bordered to the east by railroad tracks and Hesperian Boulevard to the west. Visual Assessment Unit 3 is mostly flat terrain. Views in Visual Assessment Unit 3 include

multistory industrial and commercial buildings, and two- to four-lane local roadways. As in Visual Assessment Units 1 and 2, there are partial views of the East Bay Hills.

The following viewpoints are representative of existing views within Visual Assessment Unit 3.

Figure 2.1-8 Viewpoint 4: Industrial Parkway West (Existing Condition)



Source: Google Street View Imagery, 2018

Note: View from Industrial Parkway West, looking southeast

Figure 2.1-9 Viewpoint 5: Industrial Parkway West (Existing Condition)



Source: Google Street View Imagery, 2018

Note: View from Industrial Parkway West, looking west

Figure 2.1-10 Viewpoint 8: Whipple Road (Existing Condition)



Source: Google Street View Imagery, 2018
Note: View from Whipple Road, looking west

Visual Assessment Unit 4: Residential South

Visual Assessment Unit 4 encompasses the southern-most portion of the study area and represents the residential neighborhood that is located south of Hayward's ITI Corridor, on the east side of I-880. Visual Assessment Unit 4 is comprised of the Central Park West mobile home neighborhood and adjacent track homes. The Terrain in this area is flat with views of two-lane roadways, single story mobile homes, two story track homes, and roadside vegetation. As in Visual Assessment Unit 1 and 3, there are partial views of the very distant hills to the east.

Viewpoint 11 is representative of existing views within Visual Assessment Unit 4. Additional viewpoints are described and depicted in the VIA.

Figure 2.1-11 Viewpoint 11: Parkside Drive (Existing Condition)



Source: Google Street View Imagery, 2018
Note: View from Parkside Drive, looking northwest

Viewer Groups

There are two major types of viewer groups for freeway projects: freeway neighbors and freeway users. Each viewer group has their own level of viewer exposure and viewer sensitivity, resulting in distinct and predictable visual concerns for each group which help to predict their responses to visual changes.^{18, 19}

¹⁸ *Viewer exposure* is a measure of the viewer's ability to see a particular object. Viewer exposure has three attributes: *location* of the viewer and the object, *quantity* of people seeing the object, and the *duration* of time a viewer can see the object.

¹⁹ *Viewer sensitivity* is a measure of the viewer's recognition of a particular object. It has three attributes: *activity* of the viewers, *awareness*, meaning the amount of focus on the object, and the *local values* of the viewer group.

Freeway and Roadway Neighbors

Freeway and roadway neighbors are people who would have views of the project from areas outside of the project site. Freeway neighbors within the VSA consist of residential, commercial/industrial, and pedestrian/bicyclists viewers.

As described above, Visual Assessment Unit 1 and Visual Assessment Unit 4 are comprised of residential uses, and therefore residents would be the primary viewer type within these two assessment units. Residential viewers are considered more sensitive than other land use types, considering the amount of time residents spend in their homes compared to other places such as work, shopping, or other activities.

Types of viewers in Visual Assessment Unit 3 are primarily visitors and employees of industrial and commercial businesses. There are several industrial buildings in the northern portions of Visual Assessment Unit 3, such as the auto auction venue, XPO Logistics, and the Airgas Store. Intermixed commercial and industrial multi-story buildings are located on both sides of the I-880 corridor towards the center of Visual Assessment Unit 3. Such buildings include a Home Depot, Pep Boys Auto Parts & Service, WHCI Plumbing and Supply, Public Storage, Lowes, and Walmart. The southern portions of Visual Assessment Unit 3 feature several shopping centers composed of commercial buildings and restaurants located west of the I-880 corridor. This type of user is considered less sensitive, given the short duration that visitors would typically be at businesses and the fact that visitors and employees are typically focused on other activities and less so on the exterior visual surroundings.

Several of the local roadways surrounding the I-880 corridor within the VSA feature pedestrian facilities such as sidewalks, crosswalks, and bus stops. Many of the local roadways also include Class I and II bike lanes as well as Class III bike routes. These bike paths, lanes, and routes are frequently used and are considered an integral part of the local transportation system. Users of these facilities may have limited views of the project site from areas immediately adjacent to the project site.

Freeway and Roadway Users

Freeway and roadway users are people who have views from the project while using the I-880 interchange improvements or the local roadway improvements. Subdividing freeway and roadway users by mode of travel allows for grouping by pedestrians, bicyclists, transit riders, car drivers and passengers, and truck drivers. Dividing freeway users or viewer groups by reason for travel creates categories like tourists, commuters, and haulers. To provide a more robust analysis, roadway users are divided by “reasons for travel” for this analysis, and common modes of travel for each “reason” are discussed as well. Tourists are not a major user of the corridor, therefore tourists are not discussed below.

- **Commuter Travelers:** I-880 is commonly utilized as a regional transportation facility for vehicular commuters traveling between the San Francisco Bay Area and the eastern Bay Area to and from work. The I-880/Industrial Parkway West and I-880/Whipple Road interchanges are predominantly used by Hayward and Union City residents. These travelers are most likely to travel by car or transit.
- **Local Travelers:** Local travelers are residents from nearby communities that use I-880 often to meet daily needs but are not necessarily commuting to and from work. The I-880/Industrial Parkway West interchange provides access to various industrial land uses and commercial businesses. The I-880/Whipple Road interchange offers access to several shopping centers, featuring restaurants, 24 Hour Fitness, and big-box stores including Target and Walmart. These travelers are most likely to travel by car or transit and may also walk or bike along Industrial Parkway and Whipple Road.
- **Long-Haul Travelers:** Long haul travelers include drivers of semi-trucks and other vehicles moving through the Bay Area. Similar to commuter travelers, long haul trucks use I-880 to distribute goods to the region. Long haul trucks also frequent the I-880/Industrial Parkway West Interchange which provides access to XPO Logistics.

ENVIRONMENTAL CONSEQUENCES

Resource Change

Visual impacts are determined by assessing changes to the visual resources and predicting viewer response to those changes. These impacts can be beneficial or detrimental. Cumulative impacts and temporary impacts due project construction are also considered. Table 2.1.6-1 below provides a reference for determining levels of visual impact by combining resource change and viewer response.

Table 2.1.6-1 Visual Impact Ratings Using Viewer Response

		Viewer Response				
Resource Change		Low (L)	Moderate-Low (ML)	Moderate (M)	Moderate-High (MH)	High (H)
	Low (L)	L	ML	ML	M	M
	Moderate-Low (ML)	ML	ML	M	M	MH
	Moderate (M)	ML	M	M	MH	MH
	Moderate-High (MH)	M	M	MH	MH	H
	High (H)	M	MH	MH	H	H

Source: Caltrans, 2013

Viewpoint Selection

Twelve visual simulations were prepared to represent the future visual conditions under each of the three Build Alternatives at four locations (Viewpoint 6, Viewpoint 4, Viewpoint 5 and Viewpoint 8). Selected viewpoints also represent the viewer groups that have the highest potential to be affected by the project considering exposure and sensitivity.

Overall, the Build Alternatives would replace and add freeway elements to the I-880 corridor. The additions would be generally compatible with the existing freeway and urban landscape of the VSA and, as such, implementation of the Build Alternatives would result in a moderate-low level of visual resource change. The following section describes and illustrates visual impacts by visual assessment unit, compares existing conditions to the Build Alternatives, and includes the predicted viewer response and changes to visual resources. The replacement vegetation shown in the simulations is based on conceptual landscaping plans and may not be planted as shown in this section.

Build Alternative 1

Visual Assessment Unit 1: Residential North

Resource Change

Although implementation of Build Alternative 1 would not result in physical modifications within Visual Assessment Unit 1, proposed components of the project include widening and lane restriping along the adjacent I-880 corridor. Due to existing sound walls lining southbound and northbound I-880, only vertical components of the project (e.g., lighting

fixtures and wayfinding signs) would be visible. Implementation of lighting fixtures at proposed on-ramps and off-ramps would result in an incremental increase in nighttime lighting within Visual Assessment Unit 1. However, this incremental increase in nighttime lighting would not be noticeable in the context of existing nighttime lighting in the area. Accordingly, the overall visual resource change would be low within Visual Assessment Unit 1 under Build Alternative 1.

Viewer Response

Roadway neighbors within Visual Assessment Unit 1 include residents of track homes, the Eden Roc Mobile Home Park, the Spanish Ranch Mobile Home Park, the Georgian Manor Mobile Home Community, and the New England Village Mobile Homes located west and east of I-880. Although residents within this unit have moderate-low exposure to I-880 due to predominately obstructed views, residents have moderate sensitivity because residential views are stationary and continuous by nature. Context sensitive solutions would be required and are included as a performance measure in the Avoidance, Minimization, and/or Mitigation Measures discussion, although specific treatments have not yet been identified.

The resource change within Visual Assessment Unit 1 would be low and thus, the overall level of viewer response from residents within this unit would be moderate-low.

Visual Assessment Unit 2: I-880 Corridor

Resource Change

The majority of the interchange improvements proposed under Build Alternative 1 would occur within Visual Assessment Unit 2, the I-880 corridor. Project components that would be constructed within Visual Assessment Unit 2 include improvements to the I-880/Industrial Parkway West Interchange ramps, realigning the flood control channel (Ward Creek), and the addition of a new auxiliary lane along northbound I-880 from the I-880/Alvarado Niles Road interchange to the I-880/Whipple Road-Industrial Parkway Southwest interchange. The components with the greatest potential to be visually obtrusive include the proposed I-880/Industrial Parkway West northbound off ramp and southbound on-ramp. Implementation of Build Alternative 1 would result in two new ramp structures located just south of the I-880/Industrial Parkway West overcrossing.

I-880/Industrial Parkway West Interchange

Implementation of Build Alternative 1 would result in the construction of a two-lane southbound I-880 diagonal on-ramp from Industrial Parkway West. The new on-ramp would require removal of parking and loading areas along with some existing vegetation. Although construction and operation of the proposed southbound on-ramp would remove

trees and increase the presence of man-made structures along I-880, the new diagonal on-ramp would be of similar appearance and mass compared to other on- and off-ramps along this portion of the I-880 corridor. Build Alternative 1 would include new landscaping within the right-of-way, thus maintaining the existing balance of man-made and natural elements within the viewshed.

Implementation of Build Alternative 1 would require realignment of the existing flood control channel (Ward Creek) as well as the construction and operation of a new northbound off-ramp. The new off-ramp would be a two-lane northbound I-880 diagonal off-ramp which would provide access to the I-880/Industrial Parkway West overcrossing structure (Figure 2.1-12). The northbound I-880 diagonal off-ramp structure would partially block views of the flood control channel and the adjacent auto auction property. Neither of these elements are scenic resources or sensitive views. Both of these elements would remain partially visible from I-880. Construction and operation of the new northbound I-880 off-ramp would increase the presence of man-made structures, however, the new off-ramp would be of similar appearance and mass compared to other on- and off-ramps along the I-880 corridor. Build Alternative 1 would include new landscaping within the right-of-way, thus maintaining the balance of man-made and natural elements within the viewshed.

Implementation of Build Alternative 1 would include realignment of the existing southbound I-880 off-ramp and demolishing the existing southbound loop on-ramp. Although motorists would notice visual changes within the viewshed, these modifications would be minor and would not increase the overall presence of man-made elements within the viewshed. These changes are not anticipated to affect the visual character or visual quality of the area. Proposed improvements to Industrial Parkway West and Whipple Road would result in a moderate resource change within Visual Assessment Unit 2.

Figure 2.1-12 Build Alternative 1 Visual Simulation (Viewpoint 6)

Existing Condition:



Proposed Condition:



Source: Google Street View Imagery, 2018; Mark Thomas, 2019

I-880/Whipple Road-Industrial Parkway Southwest Interchange

Implementation of Build Alternative 1 would result in modifications on both the western and eastern sides of the I-880 corridor. On the western side, Build Alternative 1 would widen the existing northbound diagonal off-ramp to Whipple Road-Industrial Parkway Southwest. On the eastern side of I-880, Build Alternative 1 would add an auxiliary lane on northbound I-880 from the Alvarado Niles Road interchange to the Whipple Road-Industrial Parkway Southwest interchange. Build Alternative 1 would also realign and widen the existing northbound loop on-ramp.

Build Alternative 1 would modify the existing I-880/Whipple Road-Industrial Parkway Southwest on-and-off-ramps. New ramp structures would not be constructed. The proposed widening of the southbound diagonal off-ramp from one to two lanes would not significantly alter the visual character of the visual assessment unit. Similarly, the northbound loop on-ramp would be widened from one to two lanes. Post-construction landscaping would maintain the balance between man-made elements and natural greenery at this interchange.

The overall resource change for Visual Assessment Unit 2 would be moderate under Build Alternative 1.

Viewer Response

Although resource changes would be noticeable to motorists and passengers, the changes would not significantly diminish the visual character or visual quality of the visual assessment unit. The backdrop of the visual setting would continue to be the existing I-880 corridor which has a low level of visual unity (Figure 2.1-12). While implementation of the project would result in more man-made features overall, the I-880 freeway would continue to be the dominant visual feature in the area. Therefore, the Build Alternative 1 would be consistent with the existing setting and would not adversely affect the key elements of visual character in the area.

Freeway and roadway neighbors would include visitors and employees of the nearby industrial and commercial businesses. Patrons and employees would likely notice increases in man-made structures at the I-880/Industrial Parkway West and the I-880/Whipple Road-Industrial Parkway Southwest interchanges. However, these viewers would not be particularly sensitive to the resource change because 1) their views would be brief and 2) employees and patrons would be primarily focused on other tasks, rather than on the I-880 infrastructure and interchanges.

Implementation of lighting fixtures at proposed on-ramps and off-ramps would result in an incremental increase in nighttime lighting within Visual Assessment Unit 2. However, this incremental increase in nighttime lighting would not be noticeable in the context of existing nighttime lighting in the area. While changes under Build Alternative 1 would reduce the amount of vegetation by introducing more man-made features, the I-880 freeway would continue to be the dominant visual feature in the urban area. Therefore, Built Alternative 1 would be consistent with the existing urban setting and would not adversely affect the key elements of visual character in Visual Assessment Unit 2.

Overall, freeway and roadway neighbors would experience a noticeable visual change due to implementation of Build Alternative 1; however, the main elements of visual character of the area would remain intact and viewer response would be moderate.

Visual Assessment Unit 3: Commercial/Industrial Center

Resource Change

I-880/Industrial Parkway West Interchange

Under Build Alternative 1, the replacement of the Industrial Parkway West overcrossing, the replacement of I-880/Whipple Road-Industrial Parkway Southwest undercrossing structures, and all of the local roadway improvements would occur within Visual Assessment Unit 3. The components with the greatest potential to be visually obtrusive include the replacement of the I-880/Industrial Parkway West overcrossing structure and the replacement of the three existing I-880/Whipple Road-Industrial Parkway Southwest undercrossing structures with one undercrossing structure.

Implementation of Build Alternative 1 would result in the replacement of the existing I-880/Industrial Parkway West overcrossing with a new seven-lane bridge structure. The new overcrossing structure would be approximately 50 feet wider than the current four-lane structure and would include 8-foot dedicated bike lanes and 6-foot sidewalks in both the eastbound and westbound directions. Figure 2.1-13, Figure 2.1-14, Figure 2.1-15 and Figure 2.1-16 include visual simulations depicting the proposed I-880/Industrial Parkway West overcrossing structure.

The proposed overcrossing would have a similar appearance and mass as the existing structure and would not alter the visual character of the visual assessment unit. The proposed overcrossing would not change the overall visual quality of this unit, but because the overcrossing would be 50 feet wider, visual unity within the Visual Assessment Unit would slightly decrease.

I-880/Whipple Road-Industrial Parkway Southwest Interchange

Implementation of Build Alternative 1 would result in the replacement of the current I-880 mainline structure (No. 33-0245), the northbound I-880 on-ramp structure (No. 33-0245S), and the southbound I-880 off-ramp structure (No. 33-0245K) with one continuous undercrossing bridge structure at the I-880/Whipple Road-Industrial Parkway Southwest undercrossing. Figure 2.1-16 includes a visual simulation depicting the proposed undercrossing structure from Whipple Road. Motorists traveling on Whipple Road, Industrial Parkway Southwest, and I-880 would have brief views of the undercrossing. The proposed undercrossing would be designed to feature a similar appearance and mass as the existing structures, and in turn would not alter the visual character of the Visual Assessment Unit. The proposed undercrossing would not change the overall visual quality of this unit.

Design Variation 1

Design Variation 1 for Build Alternative 1 would preserve the three existing Whipple Road Undercrossing structures and make improvements to the interchange and local roads within the constraints of the existing structures. Figure 2.1-17 includes a visual simulation depicting the proposed undercrossing structure from Industrial Parkway Southwest. Views seen by motorists would be the same as those described in the paragraph above, except the visual change would be less noticeable. Design Variation 1 would retain the three existing Whipple Road Undercrossing structures. Differences in roadway improvements for Design Variation 1 include restriping Whipple Road near the Industrial Parkway Southwest Intersection, widening Industrial Parkway Southwest to six lanes at the Whipple Road intersection, and widening the existing sidewalk along the north and south side of Whipple Road by constructing retaining walls at the existing undercrossing bridge abutments. The proposed roadway improvements would not change the overall visual quality of this unit. The overall resource change for Visual Assessment Unit 3 would be low under Build Alternative 1.

This design variation applies to all Build Alternatives and would be the same under each Build Alternative. Therefore, it is not discussed further under each Build Alternative below.

Figure 2.1-13 Build Alternative 1 Visual Simulation (Viewpoint 4)

Existing Condition:



Proposed Condition:



Source: Google Street View Imagery, 2018; Mark Thomas, 2019

Figure 2.1-14 Build Alternative 1 Visual Simulation (Viewpoint 5)

Existing Condition:



Proposed Condition:



Source: Google Street View Imagery, 2018; Mark Thomas, 2019

Figure 2.1-15 I 880/Whipple Road Industrial Parkway Southwest Interchange Visual Simulation (Viewpoint 8)

Existing Condition:



Proposed Condition:



Source: Google Street View Imagery, 2018; Mark Thomas, 2019

Figure 2.1-16 I 880/Whipple Road Industrial Parkway Southwest Interchange – Design
Variation 1 Visual Simulation (Viewpoint 8)

Existing Condition:



Proposed Condition:



Source: Google Street View Imagery, 2018; Mark Thomas, 2019

Viewer Response

Local motorists would continue to experience views including typical roadway components such as travel lanes, median barriers, lane striping, traffic signals, lighting fixtures, and roadside landscaping. Implementation of lighting fixtures at proposed on-ramps and off-ramps would result in an incremental increase in nighttime lighting within Visual Assessment Unit 3. However, this incremental increase in nighttime lighting would not be noticeable in the context of existing nighttime lighting in the area. Although motorists in Visual Assessment Unit 3 would notice the replacement of the I-880/Industrial Parkway Southwest overcrossing and replacement of the I-880/Whipple Road-Industrial Parkway undercrossing, their attention would be focused on the road and the cars around them. Passengers traveling along Industrial Parkway West, Whipple Road, and Industrial Parkway Southwest would have a heightened awareness of a wide range of views while traveling, because as passengers they would not be focused on driving responsibilities.

Although resource changes would be noticeable to motorists and passengers, these changes would not significantly diminish the visual character or visual quality of the visual assessment unit. The background of the visual setting would continue to be the existing I-880 corridor and adjacent roadway network which have moderate visual unity.

Patrons and employees at nearby businesses would notice the resource changes proposed under Build Alternative 1 within Visual Assessment Unit 3. Patrons of nearby businesses would spend limited amounts of time in the area, and in turn, would be less sensitive than employees who work in the area. Alternatively, employees would be focused on job responsibilities and assisting patrons. Patrons and employees of businesses near the I-880/Industrial Parkway West interchange and the I-880/Whipple Road-Industrial Parkway Southwest interchange would have limited and/or brief views of I-880 while focusing on tasks at hand or walking to and from parked vehicles.

Pedestrians and bicyclists traveling along Industrial Parkway West, Whipple Road, and Industrial Parkway Southwest would feel the increased dominance of man-made structures, especially at the I-880/Industrial Parkway West interchange. The proposed I-880/Industrial Parkway West overcrossing structure would be 50 feet wider than the existing four-lane configuration, thus decreasing visual unity and intactness of the visual assessment unit.

While changes under Build Alternative 1 would result in roadway widening and increased man-made dominance, I-880 would continue to be the dominant visual feature in the area. Therefore, Build Alternative 1 would be consistent with the existing urban setting and would not adversely affect the key elements of visual character in the area. Implementation of lighting fixtures at proposed on-ramps and off-ramps would result in an incremental increase in nighttime lighting within Visual Assessment Unit 3. This incremental increase in

nighttime lighting would not be noticeable in the context of existing nighttime lighting in the area.

Visual Assessment Unit 4: Residential South

Resource Change

Although implementation of Build Alternative 1 would not result in resource changes within Visual Assessment Unit 4, Build Alternative 1 would include the addition of an auxiliary lane along the I-880 corridor from the I-880/Alvarado Niles interchange to the I-880/Whipple Road-Industrial Parkway Southwest interchange. As the existing sound walls lining northbound I-880 and the flat topography of the area block all views of the I-880 corridor, visual changes under Build Alternative 1 would not be visible from Visual Assessment Unit 4. Accordingly, no resource change would occur within Visual Assessment Unit 4, and the overall level of resource change would be low.

Viewer Response

Roadway neighbors within Visual Assessment Unit 4 are residents of track homes and the Central Park West mobile home community located east of I-880. Although residents within this unit have low exposure to I-880 due to predominately obstructed views, residents have moderate-high sensitivity because residential views are stationary and continuous by nature. The resource change within Visual Assessment Unit 4 would be low and thus, the overall level of viewer response from residents within this unit would be low.

Build Alternative 2

Visual Assessment Unit 1: Residential North

Similar to Build Alternative 1, implementation of Build Alternative 2 would not result in physical modifications within Visual Assessment Unit 1. Due to existing sound walls lining the I-880 corridor, only vertical components of the project such as lighting fixtures and wayfinding signs would be visible. This incremental increase in nighttime lighting would not be noticeable in the context of existing nighttime lighting in the area. The resource change and viewer response within Visual Assessment Unit 1 for Build Alternative 2 would be similar to that of Build Alternative 1, as summarized above.

Visual Assessment Unit 2: I-880 Corridor

Build Alternative 2 is similar to Build Alternative 1 with the exception of the proposed southbound I-880/Industrial Parkway West ramps. Build Alternative 2 would retain the existing loop on-ramp to southbound I-880, while Build Alternative 1 would require demolition of the loop ramp. Build Alternative 2 would also include a southbound on-ramp on the south side of the interchange that would be more tightly aligned to the existing right-of-way (Figure 2.1-18). This would minimize changes to the XPO Logistics property. Although Build Alternative 2 would result in some visual change, overall, it would result in less visual change than Build Alternative 1. The resource change and viewer response within Visual Assessment Unit 2 for Build Alternative 2 would be similar to that of Build Alternative 1, as summarized above.

Build Alternative 2 is similar to Build Alternative 1 with the exception of the proposed southbound I-880/Industrial Parkway West on-ramps. Build Alternative 2 would retain the existing loop on-ramp to southbound I-880 and provide a tighter on-ramp on the south side of Industrial Parkway. Although Build Alternative 2 would result in some visual change, overall, it would result in less visual change than Build Alternative 1 (Figure 2.1-18 and Figure 2.1-19). Viewer response within Visual Assessment Unit 3 for Build Alternative 2 would be similar to that of Build Alternative 1. The resource change and viewer response within Visual Assessment Unit 3 for Build Alternative 2 would be similar to that of Build Alternative 1, as summarized above.

Visual Assessment Unit 4: Residential South

Similar to Build Alternative 1, implementation of Build Alternative 2 would not result in physical modifications within Visual Assessment Unit 4. Due to existing sound wall structure lining the I-880 corridor, the I-880 would not be visible from Visual Assessment Unit 4. The resource change and viewer response within Visual Assessment Unit 4 for Build Alternative 2 would be similar to that of Build Alternative 1, as summarized above.

Figure 2.1-17 Build Alternative 2 Visual Simulation (Viewpoint 6)

Existing Condition:



Proposed Condition:



Source: Google Street View Imagery, 2018; Mark Thomas, 2019

Visual Assessment Unit 3: Commercial/Industrial

Figure 2.1-18 Build Alternative 2 Visual Simulation (Viewpoint 4)

Existing Condition:



Proposed Condition:



Source: Google Street View Imagery, 2018; Mark Thomas, 2019

Figure 2.1-19 Build Alternative 2 Visual Simulation (Viewpoint 5)

Existing Condition:



Proposed Condition:



Source: Google Street View Imagery, 2018; Mark Thomas, 2019

Build Alternative 3

Visual Assessment Unit 1: Residential North

Similar to Build Alternatives 1 and 2, implementation of Build Alternative 3 would not result in physical modifications within Visual Assessment Unit 1. The overall visual resource change for Build Alternative 3 would be low within Visual Assessment Unit 1 as the only visible components of the project would be features such as lighting fixture and wayfinding signs, resulting in an incremental increase in nighttime lighting. However, unlike Build Alternative 1 and 2, Build Alternative 3 only proposes one southbound I-880/Industrial Parkway West on-ramp, and therefore would result in less of an increase in nighttime lighting in Visual Assessment Unit 1. Regardless, the incremental increase in nighttime lighting would not be noticeable in the context of existing nighttime lighting in the area. Viewer response and visual quality/resource change within Visual Assessment Unit 1 for Build Alternative 3 would be the same as Build Alternatives 1 and 2.

Visual Assessment Unit 2: I-880 Corridor

Build Alternative 3 is similar to Build Alternative 1 and Build Alternative 2, with the exception of the proposed southbound I-880/Industrial Parkway West on-ramp and off-ramp configurations. Unlike Build Alternative 1 and 2, Build Alternative 3 would retain the existing loop on-ramp as the only southbound on-ramp at the I-880/Industrial Parkway West interchange. Compared to Build Alternative 1 and 2, the I-880/Industrial Parkway West off-ramp would be located farther west and widened to accommodate retention of the existing loop-on ramp while providing necessary lane improvements to accommodate southbound traffic. The on-ramp and off-ramps proposed in Build Alternative 3 would result in less visual change to northbound traffic than those proposed for Build Alternatives 1 and 2 (Figure 2.1-20).

However, construction of the I-880/Industrial Parkway West off-ramp would involve the demolition of an adjacent commercial building, resulting in a visual change next to the southbound off-ramp. This change would be noticeable to roadway users and neighbors but would not notably change the visual character or quality of the surrounding industrial area, which includes large parcels and open areas with surface parking.

Because Build Alternative 3 would include only one southbound I-880/Industrial Parkway West on-ramp, it would result in less of an increase in nighttime lighting than Build Alternatives 1 and 2. Regardless, the incremental increase in nighttime lighting would not be noticeable in the context of existing nighttime lighting in the area. The overall resource change and viewer response within Visual Assessment Unit 2 for Build Alternative 3 would be similar to that of Build Alternatives 1 and 2, as summarized above.

Figure 2.1-20 Build Alternative 3 Visual Simulation (Viewpoint 6)

Existing Condition:



Proposed Condition:



Source: Google Street View Imagery, 2018; Mark Thomas, 2019

Visual Assessment Unit 3: Commercial/Industrial

Unlike Build Alternative 1 and 2, Build Alternative 3 would retain the existing loop on-ramp as the only southbound on-ramp at the I-880/Industrial Parkway West interchange (Figure 2.1-21 and Figure 2.1-22). Compared to Build Alternatives 1 and 2, the I-880/Industrial Parkway West off-ramp would be farther west and widened to accommodate retention of the existing loop-on ramp while providing necessary lane improvements to accommodate southbound traffic. Therefore, the on-ramp and off-ramps proposed in Build Alternative 3 would result in less visual change than those proposed for Build Alternatives 1 and 2. However, the commercial building adjacent to the I-880/Industrial Parkway West off-ramp would be demolished, which would result in a visual change. As discussed above, the change would be noticeable but would not alter the key visual components or features of the area.

Since Build Alternative 3 would include only one southbound I-880/Industrial Parkway West on-ramp, it would result in less of an increase in nighttime lighting in Visual Assessment Unit 3 than Build Alternatives 1 and 2. Regardless, the incremental increase in nighttime lighting would not be noticeable in the context of existing nighttime lighting in the area. For the above reasons, the overall resource change and viewer response within Visual Assessment Unit 3 for Build Alternative 3 would be similar to that of Build Alternatives 1 and 2, as summarized above.

Visual Assessment Unit 4: Residential South

Implementation of Build Alternative 3 would not result in physical modifications within Visual Assessment Unit 4. Due to existing sound walls lining the I-880 corridor, only vertical components of Build Alternative 3 such as lighting fixtures and wayfinding signs, would be visible. Implementation of lighting fixtures at proposed on-ramps and off-ramps would result in an incremental increase in nighttime lighting within Visual Assessment Unit 4. However, unlike Build Alternatives 1 and 2, Build Alternative 3 would include only one southbound I-880/Industrial Parkway West on-ramp, and therefore would result in less of an increase in nighttime lighting in Visual Assessment Unit 4. Regardless, the incremental increase in nighttime lighting would not be noticeable in the context of existing nighttime lighting in the area. Accordingly, the overall visual resource change for Build Alternative 3 would be low within Visual Assessment Unit 4.

Figure 2.1-21 Build Alternative 3 Visual Simulation (Viewpoint 4)

Existing Condition:



Proposed Condition:



Source: Google Street View Imagery, 2018; Mark Thomas, 2019

Figure 2.1-22 Build Alternative 3 Visual Simulation (Viewpoint 5)

Existing Condition:



Proposed Condition:



Source: Google Street View Imagery, 2018; Mark Thomas, 2019

No Build Alternative

Under the No-Build Alternative, none of the project features described under the Build Alternatives would be constructed. If the project were not constructed, no immediate changes would be made to I-880, the I-880/Industrial Parkway West interchange, the I-880/Whipple Road-Industrial Parkway Southwest Interchange, or the surrounding roads within the overall VSA. No construction activities would occur, and there would be no change to the operation of I-880 or local roadways. The No-Build Alternative would have no effect related to aesthetics or the visual environment.

Summary of Visual Impacts by Alternative

The most notable components of the Build Alternatives are the proposed southbound on- and off-ramp configurations, the replacement of the overcrossing structure at the I-880/Industrial Parkway West interchange, and replacement of the three existing I-880/Whipple Road undercrossing structures with one undercrossing structure. Pedestrians, bicyclists, residences, and patrons at nearby commercial businesses would feel an increased level of freeway dominance in areas where new ramps and overcrossings are proposed. The backdrop of the existing visual setting would continue to be the I-880 freeway. While changes under Build Alternatives 1, 2, and 3 would result in more man-made features, the I-880 freeway would continue to be the dominant visual feature in the area. The visual character of the Build Alternatives would be generally compatible with the existing visual character of the VSA because the proposed improvements would be of similar type and appearance to the existing transportation infrastructure within the I-880 corridor. Table 2.1.6-2 summarizes the visual impacts for the Build Alternative and the No Build Alternative and compares the narrative ratings for visual resource change and viewer response for each Visual Assessment Unit.

Table 2.1.6-2 Summary of Visual Impacts

Build Alternative	Criteria	Visual Unit 1	Visual Unit 2	Visual Unit 3	Visual Unit 4
Build Alternative 1	Resource Change	L	M	ML	L
	Viewer Response	ML	M	ML	L
	Visual Impact	ML	M	ML	L
Build Alternative 2	Resource Change	L	M	ML	L
	Viewer Response	ML	M	ML	L

Build Alternative	Criteria	Visual Unit 1	Visual Unit 2	Visual Unit 3	Visual Unit 4
	Visual Impact	ML	M	ML	L
Build Alternative 3	Resource Change	L	M	M	L
	Viewer Response	ML	M	M	L
	Visual Impact	ML	M	M	L
No Build Alternative	Resource Change	No Change	No Change	No Change	No Change
	Viewer Response	No Change	No Change	No Change	No Change
	Visual Impact	No Change	No Change	No Change	No Change

Source: Caltrans, 2013

L = Low; M; = Moderate; ML = Moderate Low

Cumulative Impacts

Cumulative impacts are those resulting from past, present, and reasonably foreseeable future actions combined with the potential visual impacts of this project. The only planned and programmed projects within the project limits are the I-880 Express Lanes project, which extends for 51 miles from Oakland to Milpitas and includes improvements to convert the northbound and southbound HOV lanes to express lanes.

The I-880 Express Lanes project would be implemented within the I-880 corridor and is expected to be completed in 2021 or later. It is reasonably anticipated that that HOV lanes conversion would occur prior to the I-880 Interchange Improvements Project. The potential visual changes from the HOV lane conversion would be limited to general roadway infrastructure such as toll signage, new freeway lighting directed at the toll lanes, and electronic toll tag readers. Under the cumulative scenario, key views across the VSA would generally consist of existing and proposed general roadway infrastructure as part of the Express Lanes project, with the I-880/Industrial Parkway West and I-880/Whipple Road-Industrial Parkway Southwest interchange and local roadway improvements being a contributing element. However, the existing visual character of VSA is dominated by roadway infrastructure such as sound walls and road overpasses. Therefore, the visual character of the VSA would not change substantially when considering the cumulative condition.

Based on the above, with consideration of all reasonably foreseeable projects, no cumulative visual impacts would occur.

PROJECT DESIGN FEATURES

Project Design Feature VIS-1: Caltrans will use standard construction equipment and protocols for the Build Alternatives.

Project Design Feature VIS-2: As directed by Caltrans, appropriate light and glare screening measures will be used at the construction staging areas including the use of downward cast lighting.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Caltrans and the FHWA mandate that a qualitative/aesthetic approach should be taken to address visual quality loss in the VSA. This approach fulfills the letter and the spirit of FHWA requirements because it addresses the actual cumulative loss of visual quality due to a project. This approach also results in avoidance, minimization, and/or mitigation measures that can lessen or compensate for a loss in visual quality. The inclusion of aesthetic features in the project design can help generate public acceptance of a project. This section describes additional avoidance, minimization, and/or mitigation measures to address specific visual impacts. These will be designed and implemented as part of the chosen Build Alternative with concurrence of the Caltrans District Landscape Architect.

The following measures to avoid or minimize visual impacts will be incorporated into Build Alternative 1, Build Alternative 2, and Build Alternative 3:

VIS-1: Existing landscaping and other roadside vegetation removed by the Build Alternatives will be replaced where proper setbacks exist and where feasible per Caltrans policy. Replacement planting would be accomplished as a separate contract, funded from the parent roadway contract, and would include a 3-year plant establishment period. The Office of Landscape Architecture will be consulted in the design phase to determine replacement requirements once tree and shrub removal quantities are known. Loss of highway planting is expected. Vegetation loss on any portion of Classified Landscape Freeway will require replacement in order to maintain the designation. Replacement highway planting and irrigation would be funded by the roadway contract source. Construction staging areas shall be located away from existing plantings and irrigation equipment. Irrigation crossovers may exist where sign foundations are proposed; therefore, sign locations may need to be adjusted in the design phase to avoid conflicts with the existing crossovers. Any existing irrigation facilities damaged by the construction work and activities will be repaired to ensure the irrigation systems are functional to support new plantings. Minor pruning of trees and shrubs will be allowed upon approval by the Resident Engineer and the Office of Landscape Architecture.

VIS-2: In order to avoid the inadvertent creation of areas that appeal to illegal encampments (e.g., open areas under bridge structures and isolated vacant lots), the final

design will include measures to discourage illegal encampments. Vacant areas under new ramp bridges will be fenced off. Other measures such as brush removal and placement of larger landscaping space-fillers, such as boulders, undulating landforms, mixed size cobbled paving, etc., may also be considered in the final design.

VIS-3: To reduce the visual impact of new retaining walls and bridge structures, aesthetic treatments consisting of color, texture and/or patterning will be applied to reduce visual impacts. The aesthetic treatment shall be context sensitive to the location and be compatible with existing walls and bridge structures in the project area. If concrete drainage ditches are required along the top of and behind retaining walls, such ditches should be stained to match the overall color of the wall or bridge structure. Aesthetic treatments will also reduce glare and deter graffiti and shall be developed during the final design phases and be approved by Caltrans.

Further, there are existing architectural features along the median barrier (oak leaves stenciled on both sides of the median barrier) within the project area. To provide a consistent corridor aesthetic, oak leaf aesthetic treatment shall be applied to new median barriers added as part of the project within the project limits. Further, existing median barriers that don't feature the oak leaf architectural feature will be enhanced with the application of the stenciled oak leaf aesthetic treatment (pre-approved concepts to be provided by D-4 Caltrans Office of Landscape Architecture). Additionally, new overpass railing/fencing, slope paving, and other architectural features are to be in line with other features along the corridor (ex: see Davis Street and Marina Street freeway intersections for existing architectural features within the local context).

2.1.7 CULTURAL RESOURCES AND TRIBAL CULTURAL RESOURCES

This section describes the project's effects on cultural resources and tribal cultural resources. Information used to prepare this includes the following resources:

- *Historic Property Survey Report (HPSR)*²⁰
- *Archaeological Survey Report (ASR)*²¹
- *Historic Resources Evaluation Report (HRER)*²²

The term "cultural resources," encompasses historic, archaeological, and burial sites. These terms are defined as:

- **Archaeological Resources:** Archaeology is the study of human activities and cultures. Prehistoric archaeological resources are associated with indigenous cultures.
- **Historic-period Archeological Resources:** These resources include artifacts from the historic era.
- **Historic Resources:** Historic resources are built resources associated with the recent past. In California, historic resources are typically associated with the Spanish, Mexican, and American periods in the state's history.
- **Burial Sites:** Burial sites are formal or informal locations where human remains, usually associated with indigenous cultures, are interred.

The term "tribal cultural resources" are either of the following:

Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:

- Included or determined to be eligible for inclusion in the California Register of Historical Resources (CRHR).
- Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1 of the Public Resources Code.

OR

A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c)

²⁰ Horizon Water and Environment, 2019. *Historic Property Survey Report*

²¹ Horizon Water and Environment, 2019. *Archaeological Survey Report*

²² Horizon Water and Environment, 2019. *Historic Resources Evaluation Report*

of Section 5024.1 of the Public Resources Code (PRC). This determination shall take into account the significance of the resource to California Native American tribes.

REGULATORY SETTING

Under federal and state laws, cultural resources that meet certain criteria of significance are referred to by various terms including “historic properties,” “historic sites,” “historical resources,” and “tribal cultural resources.” Laws and regulations dealing with cultural resources are discussed below.

Federal

The National Historic Preservation Act (NHPA) of 1966, as amended, sets forth national policy and procedures for historic properties, defined as districts, sites, buildings, structures, and objects included in or eligible for listing in the National Register of Historic Places (NRHP). Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on historic properties and to allow the Advisory Council on Historic Preservation (ACHP) the opportunity to comment on those undertakings, following regulations issued by the ACHP (36 CFR 800). On January 1, 2014, the First Amended Section 106 Programmatic Agreement (PA) among the FHWA, the ACHP, the California State Historic Preservation Officer (SHPO), and the Department went into effect for Department projects, both state and local, with FHWA involvement. The PA implements the ACHP’s regulations, 36 CFR 800, streamlining the Section 106 process and delegating certain responsibilities to the Department. The FHWA’s responsibilities under the PA have been assigned to the Department as part of the Surface Transportation Project Delivery Program (23 USC 327).

Historic properties may also be covered under Section 4(f) of the U.S. Department of Transportation Act, which regulates the “use” of land from historic properties (in Section 4(f) terminology—historic sites).

State

CEQA requires the consideration of cultural resources that are historical resources and tribal cultural resources, as well as “unique” archaeological resources. PRC Section 5024.1 established the CRHR and outlined the necessary criteria for a cultural resource to be considered eligible for listing in the CRHR and, therefore, a historical resource. Historical resources are defined in PRC Section 5020.1(j). In 2014, Assembly Bill (AB) 52 added the term “tribal cultural resources” to CEQA, and AB 52 is commonly referenced instead of CEQA when discussing the process to identify tribal cultural resources (as well as identifying measures to avoid, preserve, or mitigate effects to them). Defined in PRC Section 21074(a), a tribal cultural resource is a CRHR or local register eligible site, feature,

place, cultural landscape, or object which has a cultural value to a California Native American tribe. Tribal cultural resources must also meet the definition of a historical resource. Unique archaeological resources are referenced in PRC Section 21083.2.

PRC Section 5024 requires state agencies to identify and protect state-owned historical resources that meet the NRHP listing criteria. As a result, the Department is required to inventory state-owned structures in its rights-of-way. Sections 5024(f) and 5024.5 require state agencies to provide notice to and consult with the State Historic Preservation Officer (SHPO) before altering, transferring, relocating, or demolishing state-owned historical resources that are listed on or are eligible for inclusion in the NRHP or are registered or eligible for registration as California Historical Landmarks. Procedures for compliance with PRC Section 5024 are outlined in a Memorandum of Understanding (MOU)²³ between the Department and SHPO, effective January 1, 2015. For most federal-aid projects on the State Highway System, compliance with the Section 106 PA will satisfy the requirements of PRC Section 5024.

AFFECTED ENVIRONMENT

The Area of Potential Effects (APE) was established in consultation with Caltrans staff and approved in November 2018. The APE includes all areas where potential direct and indirect impacts to historical resources could occur as a result of project construction, operation, and maintenance for Build Alternatives 1, 2, and 3. The maximum vertical APE is 80 feet below the ground to accommodate cast-in-drilled-hole concrete pile foundations, and 2 feet above the current height of the Whipple Road interchange. The APE for potential direct impacts was established as the project footprint plus a 50-foot buffer, as well as the entire Alvarado Branch Railroad, which extends beyond the project footprint and 50-foot buffer.²⁴ The APE for potential indirect impacts was generally established as the legal parcel adjacent to where potential direct impacts would occur. The APE boundary is identical for all Build Alternatives.

Archaeological Resources

A Northwest Information Center (NWIC) records search was completed for the project on January 12, 2018, and included a 0.5-mile radius surrounding the project site. The records search identified one previously recorded prehistoric archaeological resource within 0.5

²³ The MOU is located on the SER at http://www.dot.ca.gov/ser/vol2/5024mou_15.pdf

²⁴ Alvarado Branch Railroad and Alameda Sugar Company Branch Railroad are used interchangeably when referring to the 2.5-mile branch of railroad in the APE.

mile of the APE, a previously excavated and evaluated prehistoric burn zone known as the Niles Hearth Site (P-01-011557).

A qualified archaeologist performed a pedestrian archaeological survey on November 14, 2018, within the archeological APE. Because the APE consists of a highly urbanized setting with few areas of exposed native surface, only exposed areas free of vegetation or construction debris were more closely inspected. Ten-meter transects were employed in these areas where possible. The pedestrian survey did not identify or record any archaeological resources within the archaeological APE.

The eastern portion of the APE along Ward Creek afforded the most exposed surface. This section of channel is an artificial waterway operated by the Alameda County Flood Control District, and, as such, it retains no natural creek or riparian features. Weeds or tall grasses cover a substantial percentage of the ground. The top of the channel has been improved slightly, with a gravel surface for work vehicles to travel.

The interior sections of the interchanges were surveyed in more detail; however, they are also covered in ornamental shrubs and non-native grasses. In general, construction of the interchanges and general road infrastructure conditions has substantially altered the native surface.

Although no archaeological sites were identified by the records search and pedestrian surveys, buried resources can be present with no surface manifestation. The Holocene soils that underlie the archaeological APE have the potential to contain buried archaeological remains. Based on the extensive geoarchaeological research conducted within the APE, the potential for buried archaeological deposits is high in some locations. However, subsurface examinations in the APE and other nearby locations have not yielded archaeological resources at 6 to 10 feet in depth. Overall, the potential of encountering buried or submerged archaeological resources is considered to be low.

Tribal Cultural Resources

On December 17, 2018, Horizon contacted the Native American Heritage Commission (NAHC) by email to request a search of the Sacred Lands File. The Sacred Lands File contains information on known Native American traditional or cultural properties. The NAHC responded stating that no significant resources have previously been identified in the APE. A list of interested Native American tribal representatives with traditional lands or cultural places within Alameda County was included in the NAHC response. In January 2019, certified letters were sent to all Native American contacts provided by the NAHC describing the project, providing a location map, and requesting any information and concerns the Tribes may have regarding the project or study area. A list of tribal representatives contacted in January 2019 is provided below.

- Amah Mutsun Tribal Band – Valentin Lopez, Representative
- Amah Mutsun Tribal Band – Edward Ketchum, Representative
- Amah Mutsun Tribal Band of Mission San Juan Bautista – Irenne Zwierlein, Chairperson
- Costanoan Rumsen Carmel Tribe – Tony Cerda, Chairperson
- Indian Canyon Mutsun Band of Costanoan – Ann Marie Sayers, Chairperson
- Muwekma Ohlone Indian Tribe of the San Francisco Bay Area – Charlene Nijmeh, Chairperson
- North Valley Yokuts Tribe – Katherine Erolinda Perez, Chairperson
- Ohlone Indian Tribe – Andrew Galvin, Representative

One response was received via email from Chairperson Katherine Perez of the Northern Valley Yokut tribe. She recommended that project construction be monitored by a qualified archaeologist and a Native American Monitor. Alameda CTC responded that the agency would consult with Caltrans to determine if monitoring is required. Caltrans determined that because there are no previously recorded sites in the APE and the results of the survey were negative, monitoring would not be necessary.

A follow-up call was made to Mr. Andrew Galvin on February 27, 2019, to ensure that the letter was received. Mr. Galvin did not recall the letter, but after receiving information about the results of the cultural resources studies, agreed that requiring work to stop if buried cultural resources be discovered during construction was an appropriate course of action. Alameda CTC attempted follow-up phone calls to all other tribal contacts on February 27, 2019, and left voicemails in all cases. All correspondence between the NAHC, Native American tribes, and Caltrans is provided in the project ASR.

Architectural Resources

Based on the results of the NWIC records search, a review of historic and current maps, research in archival records, and field surveys, it has been determined that there are no historic resources within the direct or indirect APE. Built environment resources 45 years or older were evaluated to accommodate the long duration of the planning and design process for transportation projects. The properties investigated during the HRER study were determined “not eligible” for listing on the NRHP or CRHR and the HPSR study includes a proposed finding of No Historic Properties Affected. Therefore, the APE does not contain any buildings or structures which qualify as historical resources for the purposes of CEQA. The following properties listed in Table 2.1.7-1 were evaluated and determined not eligible for listing on the NRHP or CRHR. Similarly, there are no built environment resources within a 0.5-mile radius of the project that are protected under the provisions of Section 4(f) of the Department of Transportation Act. See Appendix D for further detail on Section 4(f) resources.

Table 2.1.7-1 Properties Evaluated for NRHP and CRHR Eligibility

Name	Location	City	Historic Resource Status Code
XPO Logistics	2200 Claremont Court	Hayward	6Z
Airgas Building	30131 Industrial Parkway	Hayward	6Z
Cement Storage Facility	30101 Industrial Parkway	Union City	6Z
Glen Eden Subdivision	Dove Way, Osage Ave, Egret, Finch and Dove courts west of I-880 and north of Industrial Pkwy	Hayward	6Z
Town & Country Subdivision	Ascot Way, Aptos Court, and Spyglass Court north of Alvarado – Niles Road and west of Central Park West trailer park	Union City	6Z
Alameda Sugar Company Branch Railroad	Roughly 2.5-mile branch railroad that originally extended from the Alameda Sugar Company factory near Alvarado to the Livermore Line to the northeast and passes near the project area west of 30131 Industrial Parkway	Hayward	6Z

Source: Horizon Water and Environment, 2019

Historic Resource Status Code 6Z = Found ineligible for NRHP, CRHR, or local designation through survey evaluation

CONSISTENCY WITH LOCAL PLANS AND PROGRAMS

Table 2.1.7-2 provides a summary of how the project relates to relevant local plans and policies.

Table 2.1.7-2 Project Consistency with Local Plans and Programs

General Plan Policy	Project Consistency
Hayward 2040 General Plan Consistency	
Policy LU-8.6	Consistent. The project would adhere to the Secretary of the Interior's Standards for cultural resources.
Union City General Plan	
Policy NHR-C.1.4	Consistent. The project would adhere to all applicable state, federal, and local standards in evaluating cultural resources.
Policy NHR-C.1.6	Consistent. The project includes measures to protect and recover archeological resources should any be uncovered during construction.
Policy NHR-C.6	Consistent. The project includes measures to protect and recover archeological resources should any be uncovered during construction, including a measure for halting work.

Source: Circlepoint, 2019

ENVIRONMENTAL CONSEQUENCES

Build Alternatives

Construction activities associated with any of the Build Alternatives would have the potential to result in impacts to buried, previously unidentified archaeological resources. As discussed in Affected Environment, there are no known archaeological sites within the direct APE. Therefore, no known archaeological sites would be affected by the Build Alternatives. Given the level of previous disturbance within the state right-of-way during construction of I-880, existing interchange ramps, and local roadways, and the lack of previously identified resources during the construction of the existing infrastructure, no additional identification efforts are considered necessary.

The properties evaluated in Table 2.1.7-1 were determined not eligible for listing on the NRHP or CRHR as the result of this study. Because the study did not find any historic properties or historical resources within the APE, there is a finding of No Historic Properties Affected.

While no archaeological or Native American cultural resources have been recorded in the APE, there is the possibility that an unrecorded resource, such as cultural materials or human remains, could be unearthed during construction. This could result in damage to the resource and would be considered an adverse effect. Therefore, avoidance and

minimization measures are required by Caltrans to protect resources in the event of unexpected discovery during construction. Effects would be minimized in part by halting work until the resource can be evaluated by a qualified archaeologist (Measure CUL-1) and notifying the Most Likely Descendent of human remains (Measure CUL-2). These avoidance and minimization measures would reduce potential effects to archaeological resources and human remains.

Once construction is complete none of the Build Alternatives would result in impacts to cultural and tribal cultural resources, as the improved transportation facility would not endanger the integrity of built or archaeological resources.

No-Build Alternative

The No-Build Alternative would not change existing conditions; therefore, it would not affect any cultural resources.

Cumulative Impacts

The cumulative setting for cultural resources includes the areas within and surrounding the project site which have documented cultural resource sites and/or high sensitivities for unrecorded artifacts. Cumulative effects to cultural resources would occur if planned and foreseeable development results in the removal of a substantial number of historic structures or archaeological sites that, when taken in combination with the project, and could degrade the physical historical record of the larger project region. The project would not result in adverse effects to known cultural resources, and measures are in place if potentially unknown archaeological resources are discovered during construction. Therefore, the project would not contribute to any potential cumulative effects to these resources.

CALTRANS STANDARD PRACTICES AND PROCEDURES

Caltrans Standard Practice CUL-1: If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find.

Caltrans Standard Practice CUL-2: If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall cease in any area or nearby area suspected to overlie remains, and the County Coroner contacted. Pursuant to Public Resources Code Section 5097.98, if the remains are thought to be Native American, the coroner will notify the NAHC who will then notify the Most Likely Descendant (MLD).

At this time, the person who discovered the remains will contact a Caltrans Professionally Qualified Staff (PQS) Archaeologist so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.

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2.2 PHYSICAL ENVIRONMENT

2.2.1 HYDROLOGY AND FLOODPLAIN

This section evaluates effects associated with hydrology and floodplain that could occur with implementation of the project. The *Location Hydraulic Study* and *Water Quality Assessment Report* prepared for the project were used to prepare the analysis in this section.

REGULATORY SETTING

Federal

Executive Order 11988

Executive Order (EO) 11988 (Floodplain Management) directs all federal agencies to refrain from conducting, supporting, or allowing actions in floodplains unless it is the only practicable alternative. The FHWA requirements for compliance are outlined in 23 CFR 650 Subpart A.

To comply, the following must be analyzed:

- The practicability of alternatives to any longitudinal encroachments.
- Risks of the action.
- Impacts on natural and beneficial floodplain values.
- Support of incompatible floodplain development.
- Measures to minimize floodplain impacts and to preserve/restore any beneficial floodplain values affected by the project.

The base floodplain is defined as “the area subject to flooding by the flood or tide having a one percent chance of being exceeded in any given year.” This is often referred to as the “100-year floodplain.” An encroachment is defined as “an action within the limits of the base floodplain.”

AFFECTED ENVIRONMENT

The Water Quality Assessment Report incorporates information from the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) for Alameda County. The Location Hydraulic Study provides information on existing floodplains in the study area, existing watershed and floodplain management programs, and how the project

would affect floodplains and floodplain management. The hydrological study area encompasses both the project limits and the regional watershed.

The project site includes transportation infrastructure including I-880 (an interstate highway), bridged crossings, interchanges, and state ROW. The project site lies within the mildly sloping lowlands that comprise the Bay Plain geomorphic province. The province is primarily a region of sediment deposition, with inclusions of erosive areas where lateral channel migration occurs. Geomorphic features common to this province include alluvial fans emanating from the hills to the east, sand and gravel bars, and deltaic deposits in sloughs located along the bay margins, downstream of the project limits.

The regional topography of the project limits encompasses the Bay side of the Diablo Range – which forms the eastern watershed boundary – intervening alluvial fan and lowland zones, and the San Francisco Bay. The San Francisco Bay is the principal receiving water for streams and sediment from the hills. Elevations in the project watershed range from approximately 5 feet to 1,200 feet NAVD88 (North American Vertical Datum of 1988). The main waterways traversing the project limits are Ward Creek (also referred to as Line B), Line D Zone 3A (Line D) (the County flood control channel that joins Ward Creek between the two subject freeway interchanges), and Old Alameda Creek. Ward Creek joins Old Alameda Creek roughly 0.25 mile downstream of the Ward Creek undercrossing.

Watershed and Land Use

The project watershed encompasses an area of 14.9 square miles, extending from just above the zone of tidal influence to the crest of the San Francisco East Bay hills (Figure 2.2-1). The principal watercourses draining the watershed are Ward Creek and Line D, the latter comprising a primarily urban flood control channel under the jurisdiction of the ACFCD. The sub-watersheds encompassing the two interchange improvement areas include the main Ward Creek sub-watershed and its eastern branch, Line D (Figure 2.2-2).

According to the Alameda County Hydrology and Hydraulics Manual land use classifications, mapped land uses within the watershed include rural, industrial, residential with lot sizes of 3,600-5,000 square feet, and residential with lot sizes of 5,000-8,000 square feet (Figure 2.2-3). Rural land use dominates the upstream reach of Ward Creek and the surrounding area and the Maple Canyon area, both located in the northeastern portion of the watershed. Elsewhere, including the project vicinity, urbanized uses are predominant. The total percent of impervious surface in the watershed is estimated at 27 percent.

Hydrology

The local hydrology of the study area is dominated by the I-880 freeway, freeway interchanges, and infrastructure for conveying stormwater runoff under the freeway. The major focus of hydrology management in this area is to direct and convey stormwater in the most efficient way possible, to minimize the risk of flooding.

The principal channel crossings within the study area is Ward Creek (ACFCD Line B) and the Line D Zone 3A channel, as well as the north and south tributary channels discharging to the main stem channels. Downstream of the Ward Creek/Line D meeting, the water is conveyed under I-880 through a pier-supported bridged section and then enters an open channel similar to the Ward Creek outlet at Old Alameda Creek.

While flood conveyance was the primary consideration in the design of these channels, the existing infrastructure offers less than a 100-year flood protection over significant portions of the relatively low-lying areas both east and west of Ward Creek, south of Industrial Parkway.

Alameda County operates and maintains a stormwater pumping station in the study area: the Ameron Pumping Station, located at the east side of the corner of the I-880/Industrial Parkway West overpass, which is separated from the main Ward Creek channel by a levee maintenance road. The pumping station evacuates stormwater runoff from developed areas bordering Ward Creek and Line D.

Floodplains

Potentially affected reaches of ACFCD Lines A, B, and D and portions of their floodplains are within Special Flood Hazards Areas (SFHAs), the land area covered by the floodwaters of the base (100-year) flood, as delineated by FEMA. The FIRM for the study area delineates the leveed Line A and B channel reaches and the floodplain areas flanking Ward Creek and Line D as SFHAs Zone AE (see Figure 2.2-4). None of the Zone AE channel reaches are delineated as floodways. The commercial-industrial area east of Ward Creek and north of Line D is designated as Zone AH, which is subject to inundation to depths of 1 to 3 feet. Portions of the residential area north of the Industrial Parkway West bridged crossings is also designated as Zone AH. Mapped floodplain areas are modeled at a base (100-year) flood elevation of 13 feet NAVD88. In accordance with requirements of the National Flood Insurance Program (NFIP), the finished floor of any new or relocated habitable structures proposed within an SFHA would be set a minimum of 1.0 feet above the base flood elevation.

The FIRM does not show any other regulated floodplains (such as being in an area with reduced flood risk due to a levee or being in an area with increased flood risk due to levee) in the vicinity of the project limits.

The I-880/Whipple Road-Industrial Parkway Southwest improvements would occur wholly within an area identified on the FIRM as lying outside of Zone X, which is outside of the 0.2 percent annual chance floodplain (500-year floodplain). For the purposes of assessing project impacts on waterway flooding and the 100-year floodplain, the I-880/Whipple Road-Industrial Parkway Southwest improvements are not discussed further.

The 100-year flood water surface profile for the lower reach of Ward Creek, downstream of the culverted crossing at Pacheco Way, indicates a nearly flat channel gradient (0.02 percent) extending toward the Alameda Creek confluence. Tidal influence on Old Alameda Creek combined with the mild slope along lower Ward Creek and Line D produce high flood water levels. The high flood water levels restrict direct storm drain discharge from the surrounding residential and commercial areas to the north and east of the channels.

As previously discussed, the hydrology study area includes SFHAs. ACFCD completed the Zone 3A Drainage Master Plan Study, which included both Ward Creek and the lower reach of Old Alameda Creek, in 2010. Phases 3 and 4 of ACFCD's Zone 3A Drainage Master Plan Study recommend flood control improvements to provide 100-year flood protection for currently mapped SFHAs adjoining both Ward Creek and Line D upstream of the I-880 crossing. ACFCD has implemented some of the recommended improvements, including floodwall construction along the upper reaches of Line D, with additional improvements (floodwalls and levee raising) planned over the next few years.

Floodplain Natural and Beneficial Values

Natural and beneficial floodplain values include, but are not limited to fish, wildlife, plants, open space, natural beauty, outdoor recreation, scientific study, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and ground water recharge. Existing beneficial floodplain values and potential project impacts to those values are documented in the *Natural Environment Study* (NES).

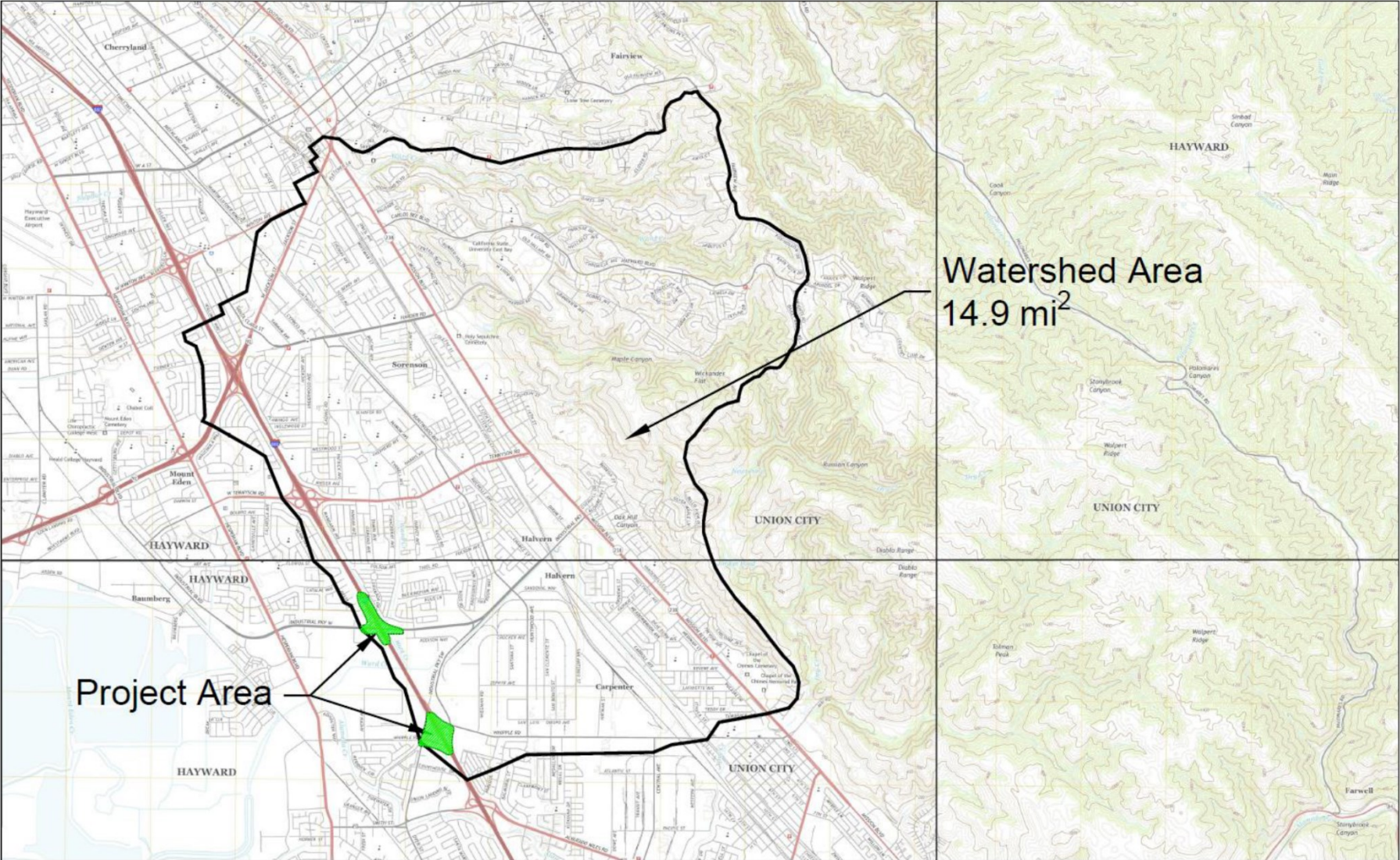
Ward Creek and Line A are considered potential Waters of the U.S. at the areas within the scoured portion of the channels, at the Ordinary High Water Mark (OHWM). The proposed improvements at the I-880/Industrial Parkway West Interchange would affect 3.12 acres of Waters of the U.S. in Ward Creek and Line A, as shown in Table 2.2.1-1.

Table 2.2.1-1 Potential Waters of the U.S. and Potentially Jurisdictional Wetland Areas within the Project Study Area (I-880/Industrial Parkway West Interchange)



Location	Route	Post Mile	Waters of the U.S. (acres)	Wetland Area (acres)
Ward Creek (Line B)	I-880	14.18-14.55	1.05	0
Line A	I-880	14.15-14.20	2.07	0

Source: Caltrans, 2020

I-880 Interchange Improvements (Whipple Road-Industrial Parkway Southwest and Industrial Parkway West) Project



Legend

-  Project Area
-  Watershed Boundary

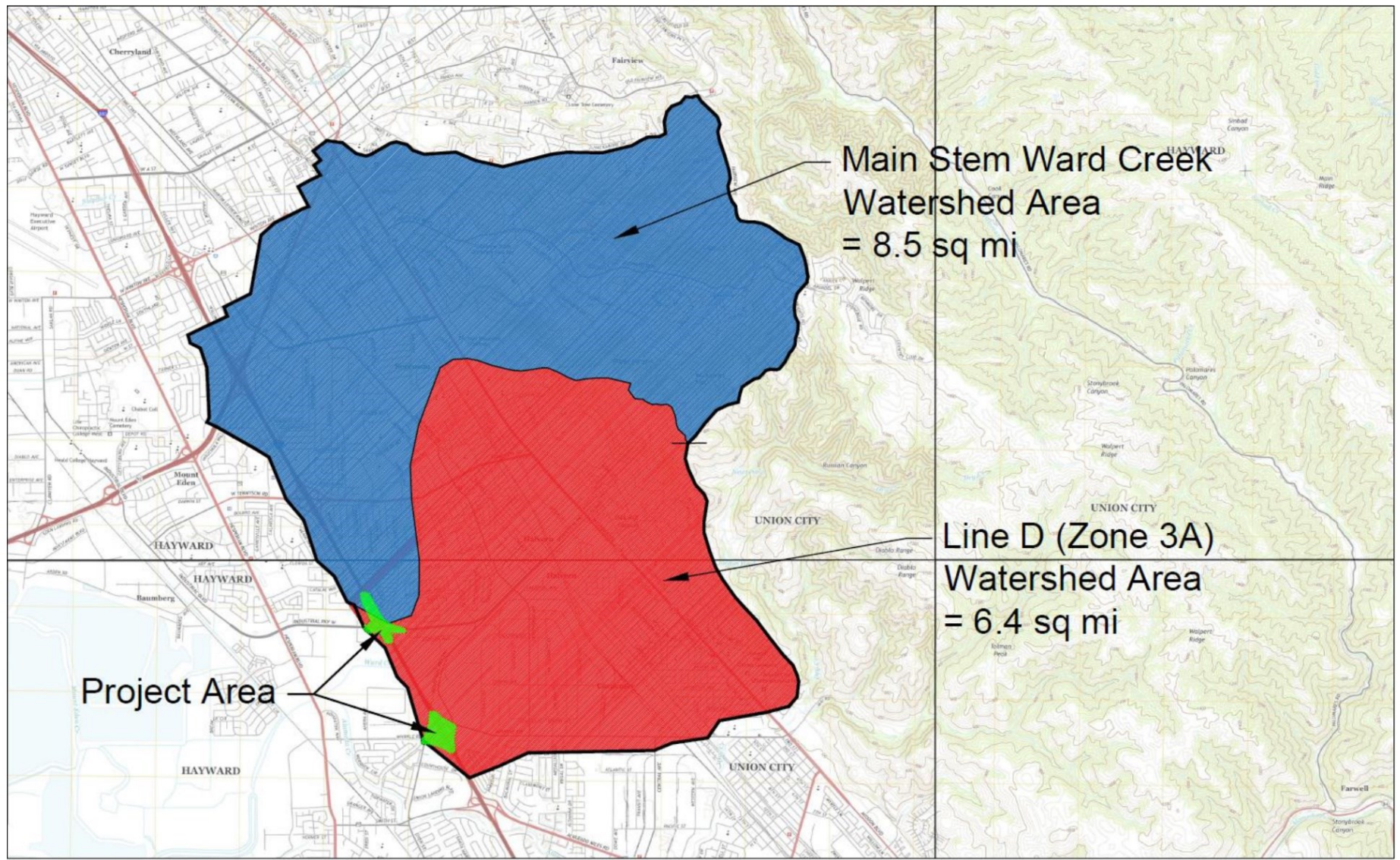
Project Watershed Map

Figure

2.2-1

Source: Circlepoint, 2019

I-880 Interchange Improvements (Whipple Road-Industrial Parkway Southwest and Industrial Parkway West) Project



Legend

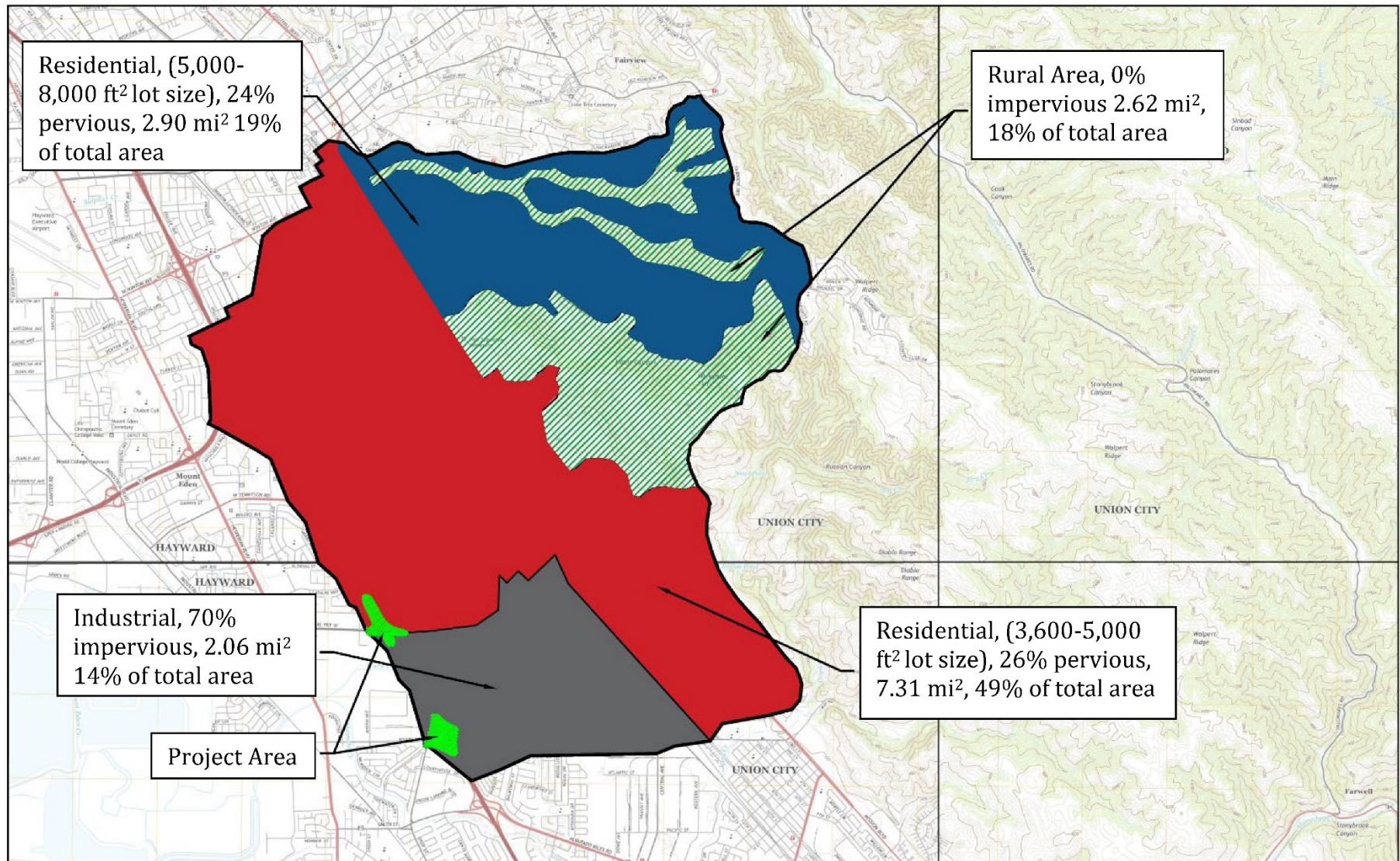


- Project Area
- Main Stem Ward Creek Watershed Area
- Line D (Zone 3A) Watershed Area
- Watershed Boundary

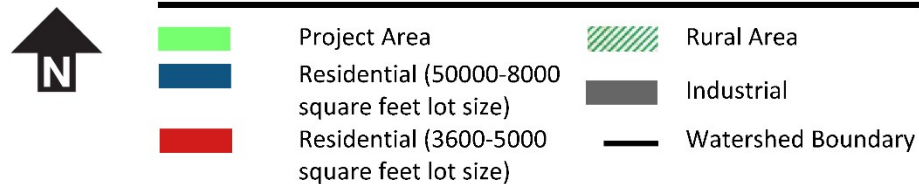
Ward Creek and Line D Sub-Watersheds

Source: Circlepoint, 2019

I-880 Interchange Improvements (Whipple Road-Industrial Parkway Southwest and Industrial Parkway West) Project



Legend

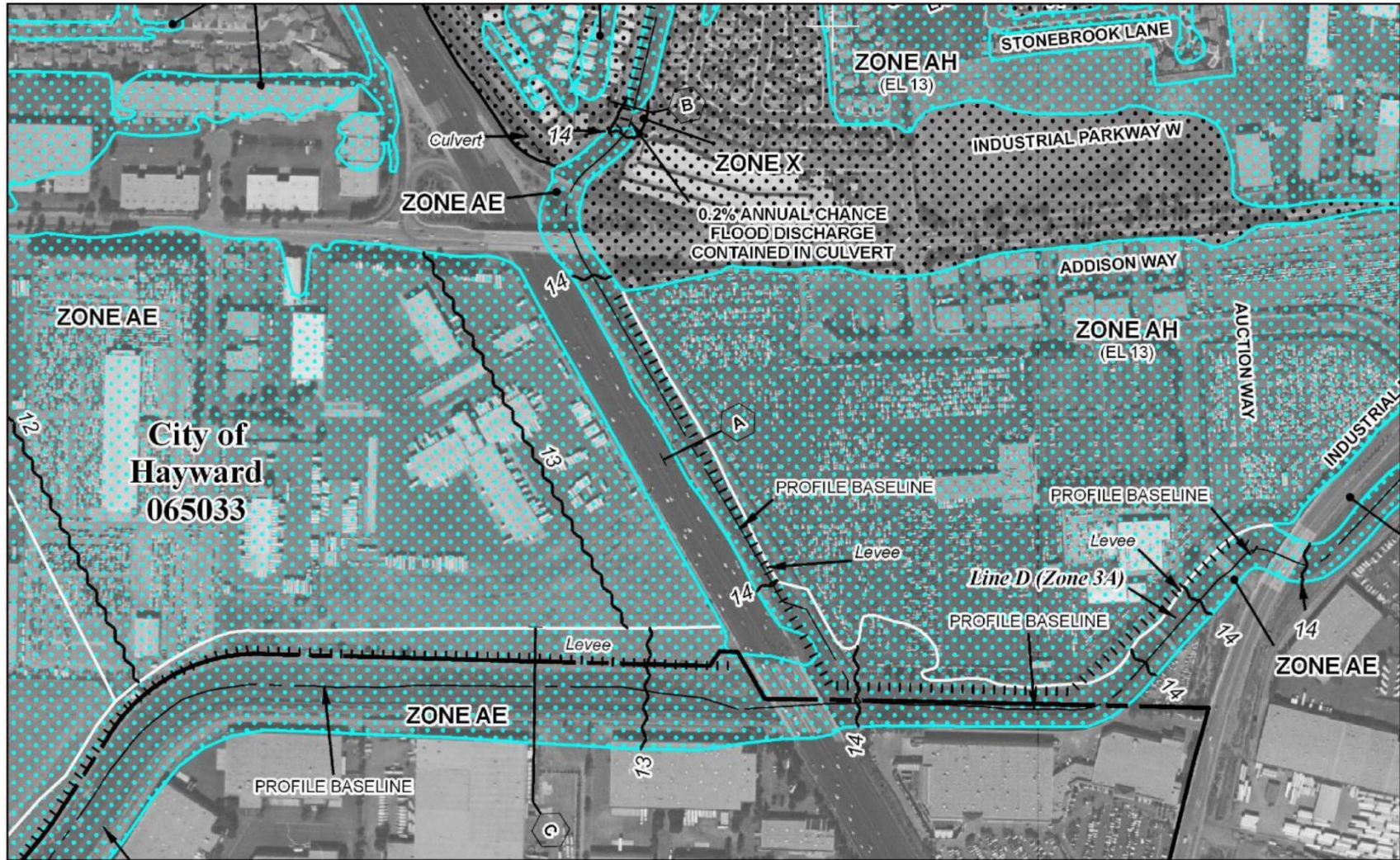


Land Uses in Project Watershed

Figure

2.2-3

I-880 Interchange Improvements (Whipple Road-Industrial Parkway Southwest and Industrial Parkway West) Project



Legend

- Special Flood Hazard Area
- 0.2 Percent Annual Chance Flood Hazard

Flood Insurance Rate Map

Figure

2.2-4

Source: Circlepoint, 2019

ENVIRONMENTAL CONSEQUENCES

Build Alternatives

Each of the Build Alternatives are identical, with the exception of the proposed southbound I-880/Industrial Parkway West on-ramp and off-ramp configurations. The proposed improvements to the northbound I-880 on- and off-ramps, including the realignment of Ward Creek, are identical between all three Build Alternatives. All the local roadway widening and proposed bicycle and pedestrian improvements under Build Alternative 1 would also be constructed under Build Alternative 2 and Build Alternative 3, except one bike and pedestrian crossing proposed at the southbound I-880 diagonal on-ramp would not be required, as a diagonal on-ramp would not be constructed.

Due to the similarities between each of the three Build Alternatives, the project's effects on hydrology and floodplains are similar for all Build Alternatives. Slight differences between each Build Alternative are noted where appropriate.

Longitudinal Encroachment

As defined by the FHWA, a longitudinal encroachment is an action within the limits of the base floodplain that is parallel to the direction of the flow. No longitudinal encroachments have been identified as part of the Build Alternatives.

Floodways are channel areas that must be kept free from encroachments, to avoid creating flood conditions upstream. The project would include realigning Ward Creek and a bridged crossing of Line A. These improvements would be within the 100-year base floodplain. Along Ward Creek the existing channel cross-section and flood conveyance would be maintained or slightly expanded, ensuring Ward Creek is able to continue effectively conveying stormwater runoff. The net impact of the I-880/Industrial Parkway overcrossing structure and the northbound I-880 on-ramp on the Ward Creek floodplain would be positive, resulting in flood flow encroachment reduction and less obstruction within the floodplain.

Risk of Action

The potential risks associated with the implementation of the project involve: 1) change in land use, including introduction of impervious surfaces; 2) filling within FEMA delineated floodplains; and 3) changes in the 100-year flood water surface elevations.

Overall, the changes in land use, including new impervious area, would be relatively minor. Impervious area values for each Build Alternative are shown in Table 2.2.2-2 of Section 2.2.2, Water Quality and Storm Water Runoff. Implementation of the Build Alternatives would increase new impervious surface area from 12.3 to 16.3 percent. However, this

range of increase would constitute less than 0.02 percent increase in the impervious area of the Ward Creek and Line D watersheds, which would not significantly affect the regional level of impervious surface area. These improvements would not alter the 100-year flood water surface elevations.

However, some overtopping (0.19 feet) of the eastern maintenance road and levee was indicated in the ACFCD's modeling, while the FIRM documentation showed that the 1 percent annual chance flood would be contained. Levee overtopping, however minimal, would influence flood elevations in the eastern floodplain. This requires further hydraulic analysis. Measure HYDRO-1 would require further hydraulic analysis to take place to confirm the existing channel condition and overtopping level, if any, due to project construction.

Floodplain Development

Incompatible floodplain development is defined as development that would negatively affect the floodplain and/or put people or structures at risk. Examples of incompatible development can include commercial development or urban growth. Because the adjoining areas within the project limits are developed, the proposed improvements would not include any incompatible floodplain development. While not a habitable structure, it is advised that the finished floor of the relocated pump station proposed along the realigned reach of Ward Creek at the I-880/Industrial Parkway West Interchange to be constructed at elevation 14 feet NAVD88, in accordance with requirements of the NFIP

The project also includes replacement and/or widening of existing bridges and improved freeway ingress and egress, as well as realignment of Ward Creek. While the project would improve existing access to developed land, it would not create new access. Being a transportation improvement project surrounded by industrial, commercial, and residential land uses, it would not include or induce incompatible floodplain development.

Floodplain Natural and Beneficial Values

As previously discussed, 3.12 acres of potential Waters of the U.S. would be temporarily affected by the Build Alternatives. However, because the Ward Creek realignment includes similar displacements on both the east and west banks, the existing Ward Creek cross-section would be maintained. Therefore, the existing acreage of Waters of the U.S. would be preserved. The realigned channel along Ward Creek would be revegetated with native grasses, forbs, and potentially wetland species. While ACFCD would likely oppose the introduction of riparian trees onto the adjacent flood terraces, riparian trees could be planted just above at roughly the 100-year base floodplain without raising the water surface elevation.

Additionally, the new piers that are part of the I-880/Industrial Parkway West overcrossing structure would be placed on the transitional embankments above the OHWM and would have a negligible impact on natural and beneficial values.

No-Build Alternative

The No Build Alternative would preserve existing conditions at the project site. No changes to hydrology, impervious surfaces, or alterations within the floodplain would occur. Planned improvements for managing flood levels would still be carried out by ACFCD as planned, separate from the project. Therefore, the No-Build Alternative would have no effect on hydrology or floodplains.

Cumulative Effects

Under the Build Alternatives, impacts to FEMA-delineated floodplains, natural and beneficial floodplains, and increases in impervious surface area would be negligible. The project would include realigning Ward Creek and constructing a bridge crossing of Line A, which would result in a net positive impact to the Ward Creek floodplain. The project also does not propose nor induce incompatible floodplain development. Some overtopping (0.19 feet) of the eastern maintenance road and levee could occur. Levee overtopping, however minimal, would influence flood elevations in the eastern floodplain. Further hydraulic analysis is required to confirm the existing channel condition and overtopping level, if any, due to project construction. However, even with the potential for minor overtopping, the project would not result in a cumulatively considerable contribution on hydrology and floodplains.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Implementation of the project would result in a low potential for flood risk. As such, no avoidance, minimization, or mitigation measures are proposed related to flooding hazards. As discussed above, to avoid affecting the natural and beneficial values of floodplains, riparian trees could be planted just above at roughly the 100-year base floodplain without raising the water surface elevation.

The potential for levee overtopping due to project construction would require further analysis as part of Measure HYDRO-1.

Measure HYDRO-1: Further Hydraulic Analysis. To determine the extent of localized overtopping of the eastern levee along Ward Creek, more refined modeling using the project grading plan is required. The most accurate existing channel topography and the associated elevations along the eastern levee of Ward Creek would be verified and used as the baseline channel condition for a more detailed hydraulic model analysis to occur.

2.2.2 WATER QUALITY AND STORM WATER RUNOFF

This section evaluates effects related to water quality and storm water runoff that may occur from implementation of the project. Information in this section draws upon multiple sources, including:

- *Water Quality Assessment Report*
- *Stormwater Data Report*
- City of Hayward General Plan
- Union City General Plan

REGULATORY SETTING

Federal

Clean Water Act

In 1972, Congress amended the Federal Water Pollution Control Act, making the addition of pollutants to the waters of the United States (U.S.) from any point source unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit.²⁵ This act and its amendments are known today as the Clean Water Act (CWA). Congress has amended the act several times. In the 1987 amendments, Congress directed dischargers of storm water from municipal and industrial/construction point sources to comply with the NPDES permit scheme. The following are important CWA sections:

- Sections 303 and 304 require states to issue water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for a federal license or permit to conduct any activity that may result in a discharge to Waters of the U.S. to obtain certification from the state that the discharge will comply with other provisions of the act. This is most frequently required in tandem with a Section 404 permit request (see below).
- Section 402 establishes the NPDES, a permitting system for the discharges (except for dredge or fill material) of any pollutant into Waters of the U.S. RWQCBs administer this permitting program in California. Section 402(p) requires permits for discharges of storm water from industrial/construction and municipal separate storm sewer systems (MS4s).

²⁵ A point source is any discrete conveyance such as a pipe or a man-made ditch.

- Section 404 establishes a permit program for the discharge of dredge or fill material into Waters of the U.S. This permit program is administered by the U.S. Army Corps of Engineers (USACE).

The goal of the CWA is “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.”

The USACE issues two types of 404 permits: general and individual. There are two types of general permits: regional and nationwide. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to allow a variety of minor project activities with no more than minimal effects.

Ordinarily, projects that do not meet the criteria for a regional or nationwide permit may be permitted under one of the USACE’s individual permits. There are two types of Individual permits: standard permits and letters of permission. For individual permits, the USACE decision to approve is based on compliance with U.S. Environmental Protection Agency’s (U.S. EPA) Section 404 (b)(1) Guidelines (40 CFR Part 230), and whether the permit approval is in the public interest. The Section 404(b)(1) Guidelines (Guidelines) were developed by the U.S. EPA in conjunction with the USACE, and allow the discharge of dredged or fill material into the aquatic system (Waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The Guidelines state that the USACE may not issue a permit if there is a least environmentally damaging practicable alternative (LEDPA) to the proposed discharge that would have lesser effects on Waters of the U.S. and not have any other significant adverse environmental consequences. According to the Guidelines, documentation is needed that a sequence of avoidance, minimization, and compensation measures has been followed, in that order. The Guidelines also restrict permitting activities that violate water quality or toxic effluent standards, jeopardize the continued existence of listed species, violate marine sanctuary protections, or cause “significant degradation” to Waters of the U.S.²⁶ In addition, every permit from the USACE, even if not subject to the Section 404(b)(1) Guidelines, must meet general requirements. See 33 CFR 320.4. A discussion of the LEDPA determination, if any, for the document is included in the Wetlands and Other Waters section.

²⁶ The U.S. EPA defines “effluent” as “wastewater, treated or untreated, that flows out of a treatment plant, sewer, or industrial outfall.”

State

Porter-Cologne Water Quality Control Act

California's Porter-Cologne Act, enacted in 1969, provides the legal basis for water quality regulation within California. This act requires a "Report of Waste Discharge" for any discharge of waste (liquid, solid, or gaseous) to land or surface waters that may impair beneficial uses for surface and/or groundwater of the state. It predates the CWA and regulates discharges to waters of the state. Waters of the state include more than just Waters of the U.S., like groundwater and surface waters not considered Waters of the U.S. Additionally, it prohibits discharges of "waste" as defined, and this definition is broader than the CWA definition of "pollutant." Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements (WDRs) and may be required even when the discharge is already permitted or exempt under the CWA.

The SWRCB and RWQCBs are responsible for establishing the water quality standards (objectives and beneficial uses) required by the CWA and regulating discharges to ensure compliance with the water quality standards. Details about water quality standards within project limits are included in the applicable RWQCB Basin Plan. In California, RWQCBs designate beneficial uses for all water body segments in their jurisdictions and then set criteria necessary to protect those uses. As a result, the water quality standards developed for particular water segments are based on the designated use and vary depending on that use. In addition, the SWRCB identifies waters failing to meet standards for specific pollutants. These waters are then state-listed in accordance with CWA Section 303(d). If a state determines that waters are impaired for one or more constituents and the standards cannot be met through point source or non-point source controls (NPDES permits or WDRs), the CWA requires the establishment of Total Maximum Daily Loads (TMDLs). TMDLs specify allowable pollutant loads from all sources (point, non-point, and natural) for a given watershed.

State Water Resources Control Board and Regional Water Quality Control Boards

The SWRCB administers water rights, sets water pollution control policy, and issues water board orders on matters of statewide application, and oversees water quality functions throughout the state by approving Basin Plans, TMDLs, and NPDES permits. RWQCBs are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

National Pollutant Discharge Elimination System Program

Municipal Separate Storm Sewer Systems (MS4)

Section 402(p) of the CWA requires the issuance of NPDES permits for five categories of storm water discharges, including Municipal Separate Storm Sewer Systems (MS4s). An MS4 is defined as “any conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels, and storm drains) owned or operated by a state, city, town, county, or other public body having jurisdiction over storm water, that is designed or used for collecting or conveying storm water.” The SWRCB has identified the Department as an owner/operator of an MS4 under federal regulations. The Department’s MS4 permit covers all Caltrans ROW, properties, facilities, and activities in the state. The SWRCB or the RWQCB issues NPDES permits for five years, and permit requirements remain active until a new permit has been adopted.

The Department’s MS4 Permit, Order No. 2012-0011-DWQ (adopted on September 19, 2012 and effective on July 1, 2013), as amended by Order No. 2014-0006-EXEC (effective January 17, 2014), Order No. 2014-0077-DWQ (effective May 20, 2014) and Order No. 2015-0036-EXEC (conformed and effective April 7, 2015) has three basic requirements:

1. Caltrans must comply with the requirements of the Construction General Permit (see below);
2. Caltrans must implement a year-round program in all parts of the state to effectively control storm water and non-storm water discharges; and
3. Caltrans storm water discharges must meet water quality standards through implementation of permanent and temporary (construction) Best Management Practices (BMPs), to the maximum extent practicable, and other measures as the SWRCB determines to be necessary to meet the water quality standards.

To comply with the permit, the Caltrans developed the SWMP to address storm water pollution controls related to highway planning, design, construction, and maintenance activities throughout California. The SWMP assigns responsibilities within the Department for implementing storm water management procedures and practices as well as training, public education and participation, monitoring and research, program evaluation, and reporting activities. The SWMP describes the minimum procedures and practices Caltrans uses to reduce pollutants in storm water and non-storm water discharges. It outlines procedures and responsibilities for protecting water quality, including the selection and implementation of BMPs. The project will be programmed to follow the guidelines and procedures outlined in the latest SWMP to address storm water runoff.

Construction General Permit

Construction General Permit, Order No. 2009-0009-DWQ (adopted on September 2, 2009 and effective on July 1, 2010), as amended by Order No. 2010-0014-DWQ (effective February 14, 2011) and Order No. 2012-0006-DWQ (effective on July 17, 2012). The permit regulates storm water discharges from construction sites that result in a Disturbed Soil Area (DSA) of one acre or greater, and/or are smaller sites that are part of a larger common plan of development. By law, all storm water discharges associated with construction activity where clearing, grading, and excavation result in soil disturbance of at least one acre must comply with the provisions of the General Construction Permit. Construction activity that results in soil disturbances of less than one acre is subject to this Construction General Permit if there is potential for significant water quality impairment resulting from the activity as determined by the RWQCB. Operators of regulated construction sites are required to develop SWPPPs; to implement sediment, erosion, and pollution prevention control measures; and to obtain coverage under the Construction General Permit.

The Construction General Permit separates projects into Risk Levels 1, 2, or 3. Risk levels are determined during the planning and design phases, and are based on potential erosion and transport to receiving waters. Requirements apply according to the Risk Level determined. For example, a Risk Level 3 (highest risk) project would require compulsory storm water runoff pH and turbidity monitoring, and before construction and after construction aquatic biological assessments during specified seasonal windows. For all projects subject to the permit, applicants are required to develop and implement an effective SWPPP. In accordance with the Department's SWMP and Standard Specifications, a WPCP is necessary for projects with DSA less than one acre.

Section 401 Permitting

Under Section 401 of the CWA, any project requiring a federal license or permit that may result in a discharge to a water of the U.S. must obtain a 401 Certification, which certifies that the project will be in compliance with state water quality standards. The most common federal permits triggering 401 Certification are CWA Section 404 permits issued by the USACE. The 401 permit certifications are obtained from the appropriate RWQCB, dependent on the project location, and are required before the USACE issues a 404 permit.

In some cases, the RWQCB may have specific concerns with discharges associated with a project. As a result, the RWQCB may issue a set of requirements known as WDRs under the State Water Code (Porter-Cologne Act) that define activities, such as the inclusion of specific features, effluent limitations, monitoring, and plan submittals that are to be implemented for protecting or benefiting water quality. WDRs can be issued to address both permanent and temporary discharges of a project.

AFFECTED ENVIRONMENT

Information in this section is based on the *Water Quality Assessment Report*. The analysis below provides data on surface water and groundwater resources within the study area, describes water quality impairments and beneficial uses, and identifies potential water quality impacts or benefits associated with project implementation. The study area for this topic is the Ward Creek watershed, shown on Figure 2.2-1.

Regional Hydrology

The project watershed encompasses an area of 14.9 square miles, extending from just above the zone of tidal influence to the crest of the San Francisco East Bay hills (Figure 2.2-1). As discussed in Section 2.2.1, Hydrology and Floodplain, the principal watercourses draining the watershed are Ward Creek and Line D, the latter comprising a primarily urban flood control channel under the jurisdiction of the ACFCD. The sub-watersheds associated with these principal drainageways are depicted in Figure 2.2-2.

Groundwater Resources

The project site is within two groundwater subbasins, the East Bay Plain Groundwater Basin (northern) and the Niles Cone Subbasin (southern), both components of the Santa Clara Valley Groundwater Basin.

The East Bay Plain (EBP) basin supplies approximately 4,700 existing wells. Backyard and commercial irrigation account for 91 percent of groundwater use, industrial processes 8.6 percent, and municipal drinking water 0.4 percent. Beneficial uses of the EBP are defined in the San Francisco Bay Basin Plan and include Municipal and Domestic Water Supply, Industrial/Process Water Supply, and Agricultural Water Supply. Agricultural use of groundwater in the EBP includes irrigation at two golf courses, three cemeteries, several high schools, colleges, parks, and plant nurseries. Groundwater use in the EBP Subbasin is limited by several factors: the availability of high-quality imported surface water, high salinities in shallow groundwater approaching the San Francisco Bay margin, the potential for saltwater intrusion, and contamination of shallow aquifers.

The majority of the project limits lie within the Niles Cone Subbasin. Within this subbasin, 68.2 percent of groundwater is allocated to Municipal Use. The beneficial uses of the Niles Cone Subbasin are the same as the EBP Subbasin, in addition to a small amount of water allocated for Municipal Recreation.

Surface Water Resources

The existing I-880/Industrial Parkway West and I-880/Whipple Road-Industrial Parkway Southwest interchanges drain to two perennial urban creeks, Ward Creek and Old Alameda Creek, which ultimately empty into the San Francisco Bay. Line D joins Ward Creek just east of the I-880 freeway, roughly midway between the two interchanges, but the existing interchanges do not drain directly to the Line D channel. All channels at the project site are modified urban flood control channels.

The San Francisco Bay Water Quality Control Plan outlines beneficial uses for Old Alameda Creek and Ward Creek. The beneficial uses are identical for both:

- Wildlife Habitat
- Water Contact Recreation
- Non-contact Recreation

The lower reaches of Old Alameda Creek is tidally influenced and thus includes Estuarine Habitat, while Warm Freshwater Habitat is limited to Ward Creek.

Ward Creek and Old Alameda Creek are listed as impaired water bodies under Section 303(d) of the CWA. Pollutants that have been identified in these water bodies include trash, diazinon, insecticides, and pesticide-related toxicity. Diazinon is commonly found in chemicals used for landscaping and is released into water bodies as runoff from the irrigation of lawns and landscaped area in developed neighborhoods. Caltrans does not use diazinon or dichlorodiphenyltrichloroethane (DDT). Region 2 of the San Francisco Bay RWQCB has adopted TMDLs for diazinon and pesticide-related toxicity for all urban creeks that drain into the San Francisco Bay. TMDLs have also been enacted for mercury and PCBs.

ENVIRONMENTAL CONSEQUENCES

Build Alternatives

The proposed improvements to the northbound I-880 on- and off-ramps, including the realignment of Ward Creek, are identical among all three Build Alternatives. All of the local roadway widening and proposed bicycle and pedestrian improvements under Build Alternative 1 would also be constructed under Build Alternative 2 and Build Alternative 3.

Because of the similarities between each Build Alternative, the project’s effects on water quality and runoff are discussed together. Slight differences between each Build Alternative are noted where appropriate.

Construction

Effects to Receiving Waters

Construction of the Build Alternatives would involve ground disturbing activities such as excavating, trenching, grading, demolition, vegetation removal. The realignment of Ward Creek and other construction activities could result in runoff that contains sediment and other pollutants. Sources of sediment include uncovered or improperly covered stockpiles, unstable slopes, bare soil, construction staging areas, and construction equipment not properly maintained or cleaned. Polluted runoff could degrade water quality if not properly controlled. Therefore, the Build Alternatives would have the potential to temporarily effect water quality. The estimated area of disturbed soil for each Build Alternative is shown in Table 2.2.2-1.

Table 2.2.2-1 Disturbed Soil

Build Alternative	Disturbed Soil Area (acres)
Alternative 1	7.55
Alternative 2	8.04
Alternative 3	7.95

Source: Mark Thomas, 2019

Potential effects to water quality would be minimized in accordance with the 2016 Caltrans Statewide SWMP through the application of Measure WQ-1. This measure includes construction erosion and sediment control BMPs, storm monitoring, and maintenance activities. Measure WQ-2 would also be applied to minimize construction-related impacts to water quality. This measure includes full revegetation of all graded and disturbed areas.

During construction, construction vehicles would be stored, refueled, and repaired/maintained at the project site. This presents a risk of accidental spills or releases of fuels, oils, or other potentially toxic materials. An accidental release could pose a threat to water quality if contaminants enter storm drains, open channels, or surface water receiving bodies (i.e., Ward Creek and Old Alameda Creek). Waste management and materials pollution control measures would be applied through Measure WQ-1 to avoid accidental spills or accidental releases that could affect water quality.

Effects to Groundwater

Groundwater conditions will be verified during the final design phase, but groundwater is expected to be encountered at elevation ranges between approximately 1 foot below sea level and 5 feet above sea level. This means new subgrade construction would likely require dewatering, including pier/pile installations and reconfiguring Ward Creek. Construction activities that contact the groundwater table or require dewatering could create loose soils and introduce pollutants to the groundwater. Measure WQ-1 Measure WQ-2, and Measure WQ-3 would be implemented to protect any groundwater from sediments or other pollutants.

Operation

The addition of impervious areas such as the widened bridge structure at the I-880/Industrial Parkway West Interchange and the addition of new on- and off-ramps could indirectly degrade water quality. An increase in impervious area would proportionately increase runoff and contaminant loading, including petrochemical constituents and heavy metals, potentially impacting water quality in Ward Creek. This is discussed in detail below, under Oil, Grease, and Chemical Pollutants. Further, impervious areas prevent runoff from naturally dispersing and infiltrating into the ground. This results in an increased concentration of water flow in stormwater conveyance channels. The increased velocity and volume of runoff in these channels could increase erosion, effecting water quality.

The amount of added and reworked impervious area is similar for each Build Alternative, with Build Alternative 3 resulting in the least amount additional impervious acres. As a result, operation of all Build Alternatives would have generally the same effect on water quality. Impervious area values for each Build Alternative are shown in Table 2.2.2-2. Impervious area grouped under the “Net New” category represents the number of additional acres of impervious surface compared to the existing, or the net new impervious area, for each Build Alternative. The “Reworked” impervious area figures refer to existing roadway and highway surfaces that would be removed and replaced, such as ramp reconfigurations. The total for each Build Alternative represents the net total acreage of impervious surface after project completion.

Table 2.2.2-2 Existing and Proposed Impervious Surface Area

Alternative	Existing Impervious Area (Acres)	Net New and Reworked Impervious Area (acres) ¹		
		Net New ²	Reworked ³	Total
Build Alternative 1	18.2	2.31	12.17	14.48
Build Alternative 2	19.1	2.92	12.6	15.52
Build Alternative 3	15.28	2.25	11.99	14.24

Source: Caltrans, 2019

¹ The acreage counts used in this table do not utilize the Whipple Road Design Variation for the I-880/Whipple Road-Industrial Parkway Southwest Interchange, which has less net new impervious area than the Build Alternatives at this location.

² Net new impervious area is additional acreage of impervious surface compared to the existing acreage of impervious surface.

³ Reworked impervious area is the acreage of existing roadway and highway surfaces that would be removed and replaced.

The existing impervious surface coverage ranges from 15.28 to 19.1 acres, depending on the Build Alternative selected. Under the Build Alternatives, net new impervious surface would range from 2.25 to 2.92 acres. For the entire Ward Creek Watershed, this represents a 0.02 to 0.03 percent increase in impervious surfaces. While such a small increase within the watershed would not reasonably contribute to notable increases in stormwater pollutants from automotive-based contaminants, the project would still comply with all statutory requirements to ensure that water quality is not adversely affected. Because all Build Alternatives would create more than 1 acre of new impervious surface, a Section 401 Permit would be required, and because of the existing impaired water quality in Ward Creek, Design Pollution Prevention measures and post-construction treatment BMPs would be required. These measures would be applied through Measure WQ-2 and Measure WQ-4, detailed below under Avoidance, Minimization, and Mitigation Measures.

Measure WQ-4 would require post-construction treatment BMPs that would filter and retain potentially contaminated stormwater runoff through two categories of BMPs: infiltration-based and capture and treat. With the incorporation of Measure WQ-4, secondary effects due to erosion and downstream impacts to water quality would be avoided.

In addition to the measures previously discussed, maintenance BMPs are preventative measures to ensure that minimal pollutants are discharged to surface waters via Caltrans' storm water drainage systems. Maintenance activities involve the use of a variety of products. Under normal, intended conditions of use, these materials are not considered pollutants of concern. However, if these products are used, stored, spilled or disposed of in a way that may cause them to contact storm water or enter storm water drainage systems, they may become a concern for water quality. Maintenance activities are performed in dry weather to minimize impacts to water quality; however, conditions may exist which require these activities be conducted in wet weather. Maintenance BMPs are outlined in the Caltrans Storm Water Quality Handbook, Maintenance Staff Guide.

Oil, Grease, and Chemical Pollutants

The increased impervious surface area for the Build Alternatives would generate minor increases in stormwater peak flow rates and runoff volumes. The amount of dissolved contaminants, automotive oil, and grease contained in stormwater runoff would also increase. However, increases in loading rates are proportional to the percent increase in impervious area within the watershed. As discussed above, the Ward Creek Watershed covers 14.9 square miles, and the Build Alternatives would increase impervious area by 0.02 to 0.03 percent within the watershed. Therefore, increases in stormwater runoff volumes and contaminants would increase by 0.02 to 0.03 percent. Implementation of Measure WQ-1 and Measure WQ-2 would minimize effects to water quality from oil, grease, and other chemical pollutants.

Additionally, the Build Alternatives would adhere to Caltrans' guidelines on the application and use of chlorpyrifos-based pesticides for control of weeds and invasive plants for maintenance of vegetated areas. Diazinon or DDT would not be used. Caltrans prepares and regularly updates its vegetation control plan, which regulates the use and application of pesticides by trained personnel. The policy requires the use of the least-toxic chemical that is available and effective to control the target plant species. Caltrans maintains a current listing of state-approved pesticides and updates it as necessary as research and technical practice evolve.

Currents, Circulation, or Drainage Patterns

The Build Alternatives would have only minor effects on the existing drainage patterns for Ward Creek, Line D, and its southern branch tributary channel. The most substantial change would occur to Ward Creek which would be realigned on the southeast side of the I-880/Industrial Parkway West Interchange. The new, slightly curved channel would likely

require biotechnical and structural bank stabilization measures to protect it. The realigned section of Ward Creek is expected to transition to the existing channel alignment upstream of the Line D confluence and should not require re-grading or realignment of the existing confluence.

Trash and Litter

Travelers on I-880 and local roadways produce trash and litter, which is often swept up in stormwater flows and conveyed into surface waters. The presence of trash and litter can result in oxygen depletion in surface waters. Certain forms of trash, particularly plastic, are harmful to aquatic life and accumulate in the food chain, ultimately affecting human health. The 303(d) list of impaired waterbodies lists Old Alameda Creek and Ward Creek as impaired for trash. Ongoing trash removal in these water bodies and throughout Alameda County is a significant aspect of Caltrans' operations and maintenance activities.

The Build Alternatives would not increase highway or roadway capacity, and therefore would not be expected to result in increased trash or litter in the study area. However, Caltrans would continue to employ trash and litter control activities through their Operations and Maintenance BMPs, described under Measure WQ-4. These BMPs are included as a standard preventative measure to ensure that increase trash and litter would not negatively affect receiving waters.

No-Build Alternative

The No Build Alternative would preserve the existing mix of impervious surface and pervious areas and would not include grading or modifications to existing drainage systems. Thus, the No-Build Alternative would have no effect on water quality.

Cumulative Effects

Implementation of the Build Alternatives would result in a 0.02 to 0.03 percent increase in impervious surfaces within the 14.9-square-mile Ward Creek Watershed. With implementation of the measures outlined in this section, the Build Alternatives would not have an adverse effect on water quality. As described above, the Build Alternatives would not result in detectable increases in cumulative watershed loading rates for automotive-based contaminants. Design Pollution Prevention BMPs would be applied to mitigate peak flow rates, minimize site erosion, and minimize downstream sedimentation. Post-Construction Treatment BMPs would be implemented to maximize stormwater infiltration rates (pervious surfaces), increase the time that stormwater is detained on-site, and filter and remove sediment. With implementation of Measures WQ-2 and WQ-4, the project would not violate any water quality standards, deplete groundwater supplies, alter

drainage patterns, or create runoff that exceeds the capacity of existing stormwater infrastructure. Therefore, the project would not result in a cumulatively considerable contribution to a significant cumulative impact related to water quality.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Short term effects to water quality would be avoided or minimized through the use of Construction Site BMPs, while long-term effects due to operation and maintenance of the project would be avoided or minimized through the use of Design Pollution Prevention BMPs, Treatment BMPs and Maintenance BMPs.

Measure WQ-1: Temporary Construction BMPs. Pursuant to the Construction General Permit, a SWPPP would be developed for the project and would comply with the Caltrans SWMP, which includes guidance for design staff to incorporate special provisions into construction contracts to include measures to protect sensitive areas and to prevent and minimize storm water and non-storm water discharges.

The SWPPP would reference the Caltrans Construction Site BMPs Manual. This manual is comprehensive and includes many other protective measures and guidance to prevent and minimize pollutant discharges. Temporary BMPs to be implemented, at a minimum, are outlined below. Further evaluation of the BMPs necessary for the project to comply with the permits and other regulatory agency requirements would be detailed prior to construction.

Construction Site BMPs would minimize temporary effects that could occur during construction by implementing the following measures:

- Temporary soil stabilization, such as the use of plastic covers for stockpiles and high visibility fences to designated areas of off-limits to the contractor.
- Temporary soil stabilization, such as the use of plastic covers for stockpiles and high visibility fences to designated areas of off-limits to the contractor.
- Temporary sediment control, which usually consists of using devices to physically block sediment runoff. Such devices include fiber rolls, silt fences, gravel bag berms, and hydraulic mulch. These devices can either divert, detain, or protect disturbed soil from erosion.
- Wind erosion control
- Dust and soil tracking control to prevent construction equipment from tracking soil and dust around and outside of the construction area. Points of entrances and exits

to the construction site would be stabilized to reduce the tracking of mud and dirt onto public roads.

- Management of water used during construction to prevent further runoff and excess water use.
- Waste management and materials pollution control, especially for concrete washout facilities. The contractor would specify vehicle washing areas to contain concrete waste materials.

Measure WQ-2: Design Pollution Prevention BMPs. Design Pollution Prevention BMPs would be employed to minimize hydromodification impacts, and may include but are not limited to:

- Attenuation of peak stormwater flow through passive or active measures to ensure peak flow volumes do not increase with project implementation. Passive measures may include runoff detention and/or self-retaining areas), and active measures may include subsurface pipe arrays or vaults with metered discharge.
- Soil modification to enhance local infiltration capacities.
- Increased on-site pervious area. This would include planting additional areas of vegetation and/or laying mulch in place of concrete, where feasible.
- Energy dissipation zones/devices to reduce erosion potential: Necessary erosion control would be applied to unlined ditches to minimize erosion downstream from potentially increased discharge.
- Temporary or long-term preservation of existing vegetation which would avoid any disturbance beyond what will be necessary to widen the existing transportation facilities.
- Drainage measures to convey concentrated culvert/storm drain discharge- lined or reinforced drainage swales/ditches, appropriate culvert outfall and inlet structures for improved hydraulic performance
- Revegetation and installation of temporary erosion protection measures (e.g. erosion control blankets, mulch, coir logs, straw wattles etc.). When practicable, slope stability and erosion concerns would be reduced by maintaining or matching existing slopes.

Measure WQ-3: Conduct work according to the 2018 Caltrans Standard

Specifications. Quality Control specifications outlined in Section 13 of the Caltrans Standard Specifications would be employed to ensure that water quality at the project site and receiving waters would not be polluted by construction activities.

Dewatering BMPs would be employed to avoid water quality contamination during dewatering activities. These BMPs include:

- Conduct dewatering activities under the Department's Field Guide for Construction Site Dewatering.
- Ensure any dewatering discharge does not cause erosion, scour, or sedimentary deposits that could impact natural bedding materials.
- Discharge the water within the project limits if, after required testing, it meets the criteria for release on-site. If water cannot be discharged within the project limits due to site constraints or contamination, it shall be disposed of off-site in accordance with Caltrans Standard Specifications, BMPs, and any other applicable permitting requirements to ensure water quality is not impacted.
- Do not discharge stormwater or non-stormwater that has an odor, discoloration other than sediment, an oily sheen, or foam on the surface. Immediately notify the Engineer upon discovering any such condition.

Measure WQ-4: Treatment BMPs. Post-construction treatment BMPs, in compliance with the Caltrans SWMP, shall be implemented to ensure the project does not increase stormwater volumes in the existing stormwater conveyance channels, thereby avoiding secondary effects such as erosion and downstream impacts to water quality. Treatment BMPs may include but are not limited to the following measures, with infiltration-based measures receiving higher priority, where feasible:

Infiltration-Based BMPs:

- Biofiltration (bioswales, infiltration trenches/galleries) to reduce sediment and other contaminant runoff
- Bioretention facilities (flow-through) to manage stormwater volumes during precipitation
- Earthen media filters to retain and filter runoff
- Detention or retention (wet) basins to remove soluble pollutants
- Capture and Treat BMPs:

- Multi-chamber treatment trains to treat stormwater in areas with limited space
- Media filters (vault type) to also treat stormwater in small sites that are highly urbanized and may be highly polluted
- Dry weather flow diversion to stop or impede water flow during dry weather
- Lined detention devices to reduce the velocity of stormwater flow
- Gross solids removal devices (in-line filters) to remove litter, debris, and vegetation from stormwater runoff

2.2.3 GEOLOGY/SOILS/SEISMIC/TOPOGRAPHY

This section describes effects on geology and soils that would result from implementation of the project. Sources of information used to prepare the analysis include:

- Preliminary Geotechnical and Foundation Report
- City of Hayward General Plan
- Union City General Plan

REGULATORY SETTING

Federal

Historic Sites Act of 1935

For geologic and topographic features, the key federal law is the Historic Sites Act of 1935, which establishes a national registry of natural landmarks and protects “outstanding examples of major geological features.” Topographic and geologic features are also protected under CEQA.

This section also discusses geology, soils, and seismic concerns as they relate to public safety and project design. Earthquakes are prime considerations in the design and retrofit of structures. Structures are designed using the Department’s Seismic Design Criteria (SDC). The SDC provides the minimum seismic requirements for highway bridges designed in California. A bridge’s category and classification will determine its seismic performance level and which methods are used for estimating the seismic demands and structural capabilities. For more information, please see the Department’s Division of Engineering Services, Office of Earthquake Engineering, SDC.

National Earthquake Hazards Reduction Program

The National Earthquake Hazards Reduction Program was established by the US Congress when it passed the Earthquake Hazards Reduction Act of 1977, Public Law 95-124. In establishing the National Earthquake Hazards Reduction Program, Congress recognized that earthquake-related losses could be reduced through improved design and construction methods and practices, land use controls and redevelopment, prediction techniques and early warning systems, coordinated emergency preparedness plans, and public education and involvement programs.

Several key federal agencies contribute to earthquake mitigation efforts. Implementation of National Earthquake Hazards Reduction Program priorities is accomplished primarily through original research, publications, and recommendations to assist and guide state, regional, and local agencies in the development of plans and policies to promote safety and emergency planning.

State

Alquist-Priolo Earthquake Faulting Act

The California Legislature passed the Alquist-Priolo Earthquake Fault Zoning Act in 1972 to mitigate the hazard of surface faulting to structures. The Alquist-Priolo Earthquake Fault Zoning Act's main purpose is to prevent the construction of buildings used for human occupancy astride the surface trace of active faults, and to require adequate structure setbacks from active faults.

Seismic Hazards Mapping Act

The Seismic Hazard Mapping Act was adopted by the California Legislature in 1990 to reduce public health and safety threats and to minimize property damage caused by earthquakes. The act directs the California Geological Survey to identify and map areas prone to earthquake hazards, such as liquefaction, earthquake induced landslides, and ground shaking. The act requires site-specific geotechnical investigations to identify potential seismic hazards and formulate mitigation measures prior to permitting most developments designed for human occupancy within seismic hazard zones.

AFFECTED ENVIRONMENT

Information in this section is based on the *Preliminary Geotechnical and Foundation Report* approved in October 2019. The geologic study area encompasses all areas that fall within the physical footprint of the project site and areas that may either be directly or indirectly affected by project-related construction activities. Because of the similarities in the location of proposed improvements under each Build Alternative, the geologic study area encompasses the combined footprint of all three Build Alternatives. The geologic study area includes various geologic features such as topography, hydrogeology, subsurface soils, geologic hazards, and seismic hazards.

Topography and Hydrogeology

The project site is in the southeastern portion of the San Francisco Bay area in the Coast Range geomorphic province of California. The Coast Range forms a nearly continuous topographic barrier between the California coastline and the San Joaquin Valley. In general,

the Coast Range in this region is a double chain of mountains running in a north-south direction. The San Francisco Bay basin lies between the two chains.

Within the study area, ground elevations along the I-880 alignment range from approximately 15 to 40 feet above sea level. Major topographic features include Ward Creek, the Ward Creek Bridge embankments which are as high as 27 feet above the creek, and the Union Pacific Railroad tracks. One of the tributaries of Ward Creek, Line D, traverses the project site at Ward Creek Bridge. A second branch of Ward Creek flows parallel to I-880 on its eastern side, between Ward Creek Bridge and Industrial Parkway West.

The average total annual precipitation is 14.3 inches in the study area. Most of the rainfall is recorded in January with the average total monthly precipitation of 3 inches. July has the least rainfall with an average of 0.02 inch. Freezing weather may occur. Groundwater elevation ranges between approximately 1 foot below sea level and 5 feet above sea level based on available boring information. Groundwater levels vary with the passage of time due to seasonal groundwater fluctuation, surface and subsurface flows into nearby water courses, runoff, and other environmental factors.

Geology and Subsurface Conditions

The geologic study area is predominately underlain by surficial sediments, which are alluvial gravel, sand, and clay soils of the Holocene era. No natural landmarks or other examples of major geologic features such as scenic rock outcroppings occur in the study area. Because no effects to natural landmarks or landforms would occur, as these resources are not located within the geologic study area, these are not discussed further.

Soils encountered within the geologic study area can be grouped into three categories, summarized in Table 2.2.3-1. Of the three different soil categories, drained sycamore silt loam is the major soil component.

Geologic Hazards

Geologic hazards include soil erosion, subsidence, expansive soils, and corrosive soils. These hazards are explained below.

Embankment Stability

Soils at the project site generally consist of soft to stiff lean clay and silts. Steep slopes constructed on these soils could potentially result in destabilized slopes.

Soil Erosion and Sedimentation

Erosion is the detachment and movement of soil through natural processes, such as wind and water. This process can be exacerbated by human activity. During a rain event, the rate of soil erosion is dependent on the slope, vegetative cover, and soil properties. Texture, structure, organic matter content, and permeability are all soil properties that influence the rate of erosion. The project site was evaluated based on the Soil Survey Map of Alameda County, prepared by the National Cooperative Soil Survey, Natural Resources Conservation Service, the U.S. Department of Agriculture, and the Web Soil Survey. As indicated in Table 2.2.3-1, the project site has been rated for slight erosion hazard.

Table 2.2.3-1 Soils and Erosion Potential

Map Unit Name	Slope (%)	Erosion Hazard (Road, Trial)
Clear Lake clay, MLRA 14	0 to 2	Slight
Danville silty clay loam	0 to 2	Slight
Sycamore silt loam, drained, MLRA 14	0 to 2	Slight

Source: Parikh Consultants, 2019

Subsidence

Subsidence is the settlement of low-density organic and saturated mineral soils after water drains out of those soils. According to the U.S. Geological Survey (USGS), the study area is not susceptible to subsidence.²⁷ Therefore, subsidence is not discussed further.

Expansive Soils

Expansive soils are fine-grained soils that can undergo a significant increase in volume when their water content increases, as well as a significant decrease in volume when the soils dry out. Changes in the water content of highly expansive soils can result in severe stress on structures constructed in these soils. Based on the available geotechnical boring information, the project site contains highly expansive soils.

²⁷ USGS, 2019. Areas of Land Subsidence in California. Available online at: https://ca.water.usgs.gov/land_subsidence/california-subsidence-areas.html; last accessed: September 2019

Mineral Resources

According to the Mineral Land Classification Map provided by the Department of Conservation, the project limits are within an MRZ-1 zone. This indicates there are no significant mineral deposits present or that there is little likelihood for the presence of mineral deposits.²⁸ Therefore, mineral resources are not discussed further.

Seismic Hazards

Surface Fault Rupture

During an earthquake, surface rupture occurs when the ground surface is broken as a result of fault movement. Surface rupture mostly occurs along active faults. The project site is not within the Alquist-Priolo Special Study Zone and no known or mapped active faults pass through the project site. Therefore, the potential for ground surface rupture due to faulting is extremely low to non-existent and is not discussed further.

Seismic Ground Shaking

The regional context is an important consideration for seismicity, because the potential seismic forces affecting the study area are regional in nature. Seismic events off-site within the Bay Area may be felt at the project site. There is a high possibility for the project site to experience strong seismic ground shaking. Measured by the Caltrans Acceleration Response System (ARS), peak ground accelerations of 0.66 g and 0.69 g were estimated at the Whipple Road undercrossing and Industrial Parkway overcrossing, respectively. The possibility of the project site to experience strong ground shaking may be considered high.

Liquefaction

Liquefaction is a phenomenon in which saturated soils are subject to a loss of shear strength and stiffness as a response to seismic shaking.²⁹ Clay soils are generally not susceptible to liquefaction. Low-density soils that are generally sandy and/or silty are commonly susceptible to liquefaction.

Although the project site is within a liquefaction zone according to the Department of Conservation, it is a result of the project's proximity to the San Francisco Bay and the

²⁸ DOC, 2019. Mineral Land Classification. Available online at: <https://www.conservation.ca.gov/cgs/minerals/mineral-land-classification-smara>; last accessed: October 2019

²⁹ Shear strength can be defined as an earth material's resistance to deformation.

alluvial fan deposits. The project site itself, however, contains soils that are not susceptible to liquefaction, as discussed below.

Borings take at the I-880/Whipple Road-Industrial Parkway Southwest interchange showed these soils are not susceptible to liquefaction. Borings taken at I-880/Industrial Parkway West Interchange encountered loose- to medium-dense granular soils. Some of the samples showed significant amounts of clay which would typically not be susceptible to liquefaction. Other borings also did not encounter liquefiable soils. Therefore, it appears that there are some soil characteristics that indicate liquefaction potential, but these soil types are not contiguous. Based on the soil borings, the project site does not contain liquefiable soils.

Landslides

Landslides occur when the shear stress placed on a soil or rock slope exceeds its shear strength. Generally, steep slopes are prone to landslides and relatively gentle slopes are not. Loading or saturation can increase the weight of soil or rock, adding to the shear stress. The shear strength of a slope can be reduced by erosion or by grading at the toe of a slide mass. The project site is located on a relatively flat terrain and there are no significant slopes in the vicinity. Therefore, the risk of landslide is considered low to very low.

Tsunamis and Seiches

Tsunamis are large sea waves caused by earthquakes in the ocean, landslides, or volcanic eruptions. A seiche is defined as a wave oscillation on the surface of water in an enclosed basin, such as a lake, which can occur as a result of seismic activity. There is no potential for tsunamis or seiches to occur within the study area due to the significant distance between the project site and the San Francisco Bay (about 1.5 miles). There are no water bodies close enough to the project site to result in a seiche event.

Volcanic Hazards

The closest volcano to the study area is Clear Lake Volcanic Field, located approximately 125 miles away from the project. This feature is considered too distant to create a hazard at the project.

ENVIRONMENTAL CONSEQUENCES

Because the Build Alternatives are located within the same geologic units and all Build Alternatives include generally the same types of interchange improvements, all three of the Build Alternatives would have the same or similar effects. Therefore, all Build Alternatives are discussed holistically.

Build Alternatives

Construction

Construction activities such as grading and excavation could potentially affect the stability of existing soils and increase the overall potential for soil erosion. Highway and roadway projects that increase natural slopes can increase the rate of soil erosion. During construction, erosion could cause sedimentation problems in storm drains, remove topsoil, create deeply incised gullies on slopes, and undermine engineered fills beneath foundations or roadways. As described above, the soil types present at the project site generally have a low susceptibility to erosion. Therefore, implementation of erosion control BMPs such as temporary silt fences, temporary environmentally sensitive area fencing, fiber rolls, temporary soil stabilizer, stockpile covers, and drainage inlet protection would reduce the risk associated with construction-period erosion. Further, natural areas should be revegetated after construction to minimize soil erosion, and ongoing maintenance of new or modified slopes should be completed to ensure slopes remain stable. These measures are applied through Measure WQ-1 and Measure WQ-2.

The project site is in a seismically active region. Given this, construction workers could be exposed to potential seismic hazards. Implementation of Measure GEO-1 would ensure worker safety by requiring employers to adhere to OSHA and Caltrans' hazard-specific standards, as well as standard design and construction guidelines.

Operation

The project site is in a geologically hazardous and seismically active region. Without proper engineering, the Build Alternatives could pose safety issues to roadway users as a result of soil erosion, expansive soils, corrosive soils, and seismic shaking. If corrosive soils are identified at locations where new subsurface facilities are proposed (e.g. bridge foundations, culverts, etc.) specially coated rebar, or alternative pipe culverts would be specified in the contract documents.

As previously discussed, there is a high probability of expansive soils within the project site. Implementation of Measure GEO-2 would avoid adverse effects related to expansive soils by requiring the treatment of expansive soils with lime or other additives in order to reduce the soil's expansion potential.

Seismic shaking could result in damage to or collapse of bridges; rupturing of underground pipelines; and cracking and distortion of pavement, walls and foundations. Proposed bridge structures and new and modified on- and off-ramps could increase the risk of structural damage if not properly designed. The Build Alternatives would be designed and

constructed in accordance with applicable Caltrans seismic design criteria to avoid or minimize seismic risks. Measure GEO-3 outlines Caltrans' process and requirements to address seismic risk.

No-Build Alternative

Under the No-Build Alternative, none of the project features described under the Build Alternatives would be constructed. No change to the existing interchange structures would be implemented. Therefore, the No-Build Alternative would not result in adverse effects related to geologic, seismic, topographic, or soils-related risks.

Cumulative Effects

Cumulative impacts arise due to the linking of impacts from past, present, and foreseeable future projects in the region. Other projects in the study area include residential, commercial, and infrastructure development projects in Hayward, Union City, and within Alameda County. Because geologic impacts are site-specific and highly dependent upon the structural characteristics of individual projects, cumulative geologic hazard and soils impacts are generally confined to the project limits and immediate vicinity.

Geological/seismic hazards related to future development in areas surrounding the project site relate to the type of building and building foundation proposed, as well as the soil composition and slope on each site. There is no additive effect of the geological/seismic hazards associated with other approved or foreseeable development and the project, and therefore no cumulative effects would occur.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

All new or modified structures would be constructed in compliance with Caltrans seismic design standards and construction guidelines. However, to further avoid potential geologic hazards to the public, avoidance, minimization, or mitigation measures would be required beyond the implementation of the Caltrans standard specifications. All measures listed below are applicable to all Build Alternatives.

As described in Section 2.2.2, Water Quality and Storm Water Runoff, erosion control measures would be implemented during construction activities in accordance with the BMPs outlined in the SWPPP. Protective measures would reduce soil erosion and minimize impacts to water quality, including groundwater.

Measure GEO-1: With respect to worker safety during construction, OSHA requires employers to comply with hazard-specific safety and health standards. Pursuant to Section 5(a) (1) of OSHA, employers must provide their employees with a workplace free from

recognized hazards likely to cause death or serious physical harm. Potential seismic-related hazards to workers during construction are expected to be less than substantial with compliance with the OSHA and Caltrans standard design and construction guidelines.

Measure GEO-2: Expansive soils shall be addressed through treatment or removal, in order to reduce the potential for structural damage. Treatment of expansive soil may include lime or other additives to reduce expansion potential. Expansive soils may also be replaced with a non-expansive fill material to a depth where the seasonal moisture content variation becomes relatively insignificant. The appropriate depth shall be determined by a qualified structural engineer.

Measure GEO-3: As part of the final design phase, Caltrans requires preparation of structure foundation reports and geotechnical design reports that incorporate the results of subsurface field work and laboratory testing. Site-specific subsurface soil conditions, slope stabilities, and groundwater conditions within the project site would be verified during the preparation of these reports. The identification of site-specific soil conditions within the project site would be used to determine the appropriate final design for foundations that would support the project's structures. If corrosive soils are identified at locations where new subsurface foundations and/or piles are proposed (e.g. bridge foundations, culverts, etc.), specially coated rebar or alternative pipe culverts would be specified in the contract documents.

Caltrans' standard design and construction guidelines incorporate engineering standards that address seismic risks. Proposed structures, such as retaining walls and overhead ramp supports, constructed within the geologic study area, would consider seismically-induced liquefaction and settlement during the final design phase.

The final design phase would also include the evaluation of the Design Response Spectrum, which measures the ground motion or acceleration caused by the input of a vibration from an earthquake at a specific location and can help in understanding how structures would respond to earthquakes in a given place. This information will be used to inform the final design of project structures.

2.2.4 PALEONTOLOGY

This section evaluates effects to paleontological resources that could occur with implementation of the project. Paleontology is the study of plant and animal fossils from the prehistoric era. Paleontological resources are the remains of scientifically important organisms, mainly vertebrates that are older than 10,000 years.

Sources of information used to prepare the analysis in this section include:

- Paleontological Evaluation Report (PER)³⁰
- City of Hayward General Plan
- Union City General Plan

REGULATORY SETTING

Federal

Paleontology is a natural science focused on the study of ancient animal and plant life preserved in the geologic record as fossils. Several federal statutes address paleontological resources, their treatment, and funding for mitigation as a part of federally authorized projects.

The Antiquities Act

16 USC 431-433 (the “Antiquities Act”) prohibits appropriating, excavating, injuring, or destroying any object of antiquity situated on federal land without the permission of the Secretary of the Department of Government having jurisdiction over the land. Fossils are considered “objects of antiquity” by the Bureau of Land Management, the National Park Service, the Forest Service, and other federal agencies.

The National Natural Landmarks program

6 USC 461-467 established the National Natural Landmarks (NNL) program. Under this program property owners agree to protect biological and geological resources such as paleontological features. federal agencies and their agents must consider the existence and location of designated NNLs, and of areas found to meet the criteria for national significance, in assessing the effects of their activities on the environment under NEPA.

³⁰ Paleo Solutions, 2019. *Paleontological Survey Report*

The Paleontological Resources Preservation Act

16 USC 470aaa (the Paleontological Resources Preservation Act) prohibits the excavation, removal, or damage of any paleontological resources located on federal land under the jurisdiction of the Secretaries of the Interior or Agriculture without first obtaining an appropriate permit. The statute establishes criminal and civil penalties for fossil theft and vandalism on federal lands.

Other Applicable Federal Codes

23 USC 1.9(a) requires that the use of federal-aid funds must be in conformity with all federal and state laws.

23 USC 305 authorizes the appropriation and use of federal highway funds for paleontological salvage as necessary by the highway department of any state, in compliance with 16 USC 431-433 above and state law.

State

State of California Public Resource Code

The State of California Public Resources Code (Chapter 1.7), Sections 5097 and 30244, include state level requirements for the assessment and management of paleontological resources. These statutes require reasonable mitigation of adverse impacts to paleontological resources resulting from development on state lands. The statutes also define the excavation, destruction, or removal of paleontological “sites” or “features” from public lands without the express permission of the jurisdictional agency as a misdemeanor. As used in Section 5097, “state lands” refers to lands owned by, or under the jurisdiction of, the state or any state agency. “Public lands” is defined as lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof.

AFFECTED ENVIRONMENT

Information in this section is based on the PER approved in September 2019. The paleontological study area encompasses all areas of the project site that would be affected by ground disturbing activities for all three Build Alternatives. This section discusses the study area’s sensitivity for paleontological resources (i.e., vertebrate, invertebrate, and plant fossils). The types, distribution, and age of sediments in the study area determine the probability of encountering significant fossils during project construction.

The paleontological study area is entirely underlain by Holocene-alluvial deposits (deposits 11,700 years old or less). However, Pleistocene alluvial deposits, which are approximately 2.6 million to 11.7 thousand years old, are likely to underlie the Holocene-aged deposits. The likely depth of Pleistocene soils is unknown. Table 2.2.4-1 presents a summary of the geological units within the study area, and their respective paleontological sensitivities.

Table 2.2.4-1 Paleontological Sensitivities for Geological Units within Project Limits

Map Symbol	Age	Formation	Physical Characteristics	Typical Occurrence of Paleontological Resources
Qa	Holocene	Holocene Alluvial deposits	Alluvial gravel, sand, and clay of valley areas and sand of major stream channels.	Not known to contain significant resources
Not Mapped	Pleistocene	Pleistocene Alluvial deposits	Dissected terrace remnants consisting of alluvial gravel and sand.	Vertebrates, including bison and sloth, invertebrates, including mollusks, and plants

Source: PER

Holocene Alluvial Deposits

Holocene deposits within the study area consist of alluvial gravel, sand, clay of valley areas, and sand of major stream channels. These deposits underly the whole study area and are too young to contain paleontological resources. As such, there is a low potential of discovering paleontological resources in this geologic unit.

Pleistocene Alluvial Deposits

Unmapped Pleistocene alluvial deposits are likely to underlie the Holocene deposits at an unknown depth within the study area. These deposits typically consist of dissected terrace remnants composed of gray-brown alluvial gravel and sand. Pleistocene deposits have been known to produce significant vertebrate fossils in the project region. Pleistocene alluvial deposits have yielded a variety of vertebrate fossils, invertebrate fossils, and plants fossils. Due to the fact that vertebrate fossils have previously been reported in this geologic unit type, there is a high potential that additional significant paleontological resources would be encountered in the Pleistocene sediments within the geologic study area.

ENVIRONMENTAL CONSEQUENCES

Because the Build Alternatives are located within the same paleontological setting, project effects would be the same under each Build Alternative.

Build Alternatives

Under the Build Alternatives, earthmoving and ground disturbing activities could adversely affect buried paleontological resources. Native Pleistocene-aged alluvial deposits could be encountered beneath the Holocene-aged alluvial sediments during deep excavations. Since the depth of Pleistocene soils is not known, it is assumed that construction activities could encounter this soil type. If present, subsurface paleontological resources could be unintentionally destroyed through breakage and/or crushing as the result of excavation and foundation/pile work. The following construction activities would have the greatest potential to encounter paleontological resources:

- Excavations for the undercrossing and overcrossing structures
- Excavations to realign Ward Creek

Because construction activities may encounter paleontologically sensitive Pleistocene deposits, Measure PAL-1 would be implemented to avoid damage to or destruction of paleontological resources. This measure requires preparation of a detailed Paleontological Mitigation Plan prior to construction, along with construction monitoring.

Excavations for roadway widening are anticipated to be shallow (approximately 3 feet deep) and would occur entirely within Holocene-aged alluvial sediments that are unlikely to contain paleontological resources. There would be no potential for impacts on paleontological resources during project operation, because ground disturbances would only occur during the construction period.

No-Build Alternative

Under the No-Build Alternative, none of the project features described under the Build Alternatives would be constructed. No change to the existing interchange structures would be implemented, and there would be no excavation or other ground-disturbing activity. Therefore, the No-Build Alternative would not result in adverse effects related to paleontological resources.

Cumulative Effects

The cumulative setting for paleontological resources includes the areas within and surrounding the project site which have documented paleontological resource sites or a high sensitivity for unrecorded fossils. Cumulative effects on paleontological resources

would occur if planned and foreseeable projects, when taken in combination with the project, would result in the removal of a substantial number of paleontological resources resulting in overall damage to the physical historical record of the larger region.

As described above, with implementation of Measure PAL-1, the Build Alternatives would not result in an adverse effect on paleontological resources. Paleontological resources are protected by several federal, state, and local regulations. In Hayward, all grading plans for development projects are to include a contractor provision that in the event fossils are encountered, construction shall be temporarily halted. At that time, the lead agency would be notified immediately. A qualified paleontologist shall evaluate the fossils and take steps necessary to photo-document or recover the fossils. This level of preventative measure is also included in Caltrans' standard specifications for transportation improvements within state right-of-way. Implementation of existing regulations and NEPA and/or CEQA evaluation on a project-by-project basis would avoid cumulative effects to paleontological resources in the region. Therefore, no cumulative effects would occur.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Measure PAL-1: Paleontological Mitigation Plan. Prior to construction, a Paleontological Mitigation Plan (PMP) shall be drafted and will include provisions for periodic spot checks to check for the presence of Pleistocene deposits during deeper excavations. Full-time monitoring shall be implemented if Pleistocene deposits are observed. In the event of unanticipated paleontological resource discoveries during project related activities, work in the immediate vicinity of the discovery shall be halted until it can be evaluated by a qualified paleontologist.

2.2.5 HAZARDOUS WASTE/MATERIALS

This section evaluates effects associated with hazards and hazardous materials that could occur with implementation of the project. Sources of information used to prepare the analysis in this section include:

- Phase I Initial Site Assessment
- City of Hayward General Plan
- Union City General Plan

REGULATORY SETTING

Federal

Hazardous materials, including hazardous substances and wastes, are regulated by many state and federal laws. Statutes govern the generation, treatment, storage and disposal of hazardous materials, substances, and waste, and also the investigation and mitigation of waste releases, air and water quality, human health, and land use.

The primary federal laws regulating hazardous wastes/materials are the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, and the Resource Conservation and Recovery Act (RCRA) of 1976. The purpose of CERCLA, often referred to as “Superfund,” is to identify and cleanup abandoned contaminated sites so that public health and welfare are not compromised. The RCRA provides for “cradle to grave” regulation of hazardous waste generated by operating entities. Other federal laws include:

- Community Environmental Response Facilitation Act (CERFA) of 1992
- Clean Water Act
- Clean Air Act
- Safe Drinking Water Act
- Occupational Safety and Health Act (OSHA)
- Atomic Energy Act
- Toxic Substances Control Act (TSCA)
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

In addition to the acts listed above, EO 12088, Federal Compliance with Pollution Control Standards, mandates that necessary actions be taken to prevent and control environmental pollution when federal activities or federal facilities are involved.

State

California regulates hazardous materials, waste, and substances under the authority of the California Health and Safety Code and is also authorized by the federal government to implement RCRA in the state. California law also addresses specific handling, storage, transportation, disposal, treatment, reduction, cleanup, and emergency planning of hazardous waste. The Porter-Cologne Water Quality Control Act also restricts disposal of wastes and requires cleanup of wastes that are below hazardous waste concentrations but could impact ground and surface water quality. California regulations that address waste management and prevention and cleanup of contamination include Title 22 Division 4.5 Environmental Health Standards for the Management of Hazardous Waste, Title 23 Waters, and Title 27 Environmental Protection.

Worker and public health and safety are key issues when addressing hazardous materials that may affect human health and the environment. Proper management and disposal of hazardous material is vital if it is found, disturbed, or generated during project construction.

AFFECTED ENVIRONMENT

Information for this section is based on the *Phase I Initial Site Assessment (ISA)* prepared for the project. The hazardous materials study area includes the project site (encompassing all Build Alternatives) and the area within 1 mile of the project site. The ISA includes a review of the physical setting, site history, and environmental records. Site reconnaissance was completed as a part of the ISA in September 2019. No evidence of hazardous materials releases or future threats of hazardous materials releases were observed within or adjacent to the study limits. However, this visual survey cannot completely exclude the possibility of environmental hazards; hazards or hazardous materials that were not visible during the survey may still be present at the project site.

Environmental records reviewed in the ISA were derived from the U.S. Environmental Protection Agency *Enforcement and Compliance History Online* database, *GeoTracker* database, and Department of Toxic Substances Control (DTSC) *EnviroStor* database. Additional records regarding previous environmental investigations were also requested, as needed, from the Alameda County Water District (ACWD).

Summary of Hazardous Release Sites

The review of environmental records identified 44 hazardous materials release sites within one mile of the project site. There were no documented hazardous material releases within the project site. Hazardous materials released near the project site could potentially affect environmental conditions at the project site by migrating either on the ground surface or in soils. Additionally, groundwater contaminated with hazardous materials outside of the project site could potentially migrate and contaminate ground water at the project site.

Hazardous releases can occur from previous site uses, such as agricultural and industrial uses. Common types of hazardous releases are diesel fuel, gasoline, and oil spills, as well as pesticide use and aerially deposited lead from historic gasoline use. Leaking underground storage tanks (LUST) are one of the most common types.

Based on these screening criteria, 11 of the 44 release sites were identified as having potential to contaminate the project site. The other 33 release sites are not expected to affect environmental conditions at the project site due to their distance from the project site, the type of contamination, the status of the site as closed (remediated), or a combination of these factors. The 11 sites of potential concern are described in Table 2.2.5-1 and shown in Figure 2.2-5. See the Phase I ISA for a full summary of the environmental records search for each of the 44 identified sites.

Table 2.2.5-1 Hazardous Materials Release Sites

Site No.	Site Name and Location	Status	Type
01	Overnite Transportation Company, 2348 Industrial Parkway West	Open – Site Assessment	LUST Cleanup Site
02	Conway Western Express, 2200 Claremont Court	Completed – Case Closed	LUST Cleanup Site
03	Golden Gate Petroleum, 1565 Industrial Parkway West	Open – Site Assessment	LUST Cleanup Site
04	Calaveras Cement, 30101 Industrial Parkway	Completed – Case Closed	Cleanup Program Site
05	Chevron #9-3142, 30151 Industrial Parkway Southwest	Completed – Case Closed	LUST Cleanup Site
06	Mobil 10-LD2/BP 11269, 2492 Whipple Road	Open – Site Assessment	LUST Cleanup Site
07	Crescent Truck Lines, 2480 Whipple Road	Open – Site Assessment	LUST Cleanup Site

Site No.	Site Name and Location	Status	Type
08	SAMMIS PCA, 2801 Whipple Road	Open – Eligible for Closure	LUST Cleanup Site
09	Texaco Station No. 21-1345, 1998 Whipple Road	Open – Verification Monitoring	Cleanup Program Site
10	Shell Station, 32187 Alvarado Niles Road	Open – Site Assessment	LUST Cleanup Site
11	Reynolds Aluminum, 2425 Whipple Road	Open – Verification Monitoring	Cleanup Program Site

Source: *Phase I Initial Site Assessment*
LUST = leaking underground storage tank

Of the 11 sites summarized above, contamination related to six sites is not expected to be encountered during project construction. These six sites are described below and will not be discussed further. The remaining five sites are listed in Table 2.2.5-2 and are discussed further in this section.

Overnite Transportation Company

In 1991, a release of petroleum from leaking underground storage tanks (LUSTs) was reported at the Overnite Transportation Company site (Site 01 on Figure 2.2-5). Based on the most recent groundwater monitoring, the edge of the petroleum hydrocarbon plume is located about 1,200 feet southwest of the project site. Based on the relative distance between the release site and the project site, groundwater contamination from the release site is not expected to be encountered during project construction, and this release site is not discussed further.

Golden Gate Petroleum

In 1998, a release of petroleum from LUSTs was reported at the Golden Gate Petroleum site (Site 03 on Figure 2.2-5). Based on the most recent groundwater monitoring activities, the edge of the petroleum hydrocarbon plume is located about 1,500 feet east of the project site. Based on the relative distance between the release site and the project site, groundwater contamination from the release site is not expected to be encountered during project construction, and this release site is not discussed further.

SAMMIS PCA

In 1991, a release of petroleum hydrocarbons and chlorinated solvents was reported at the SAMMIS PCA site (Site 08 on Figure 2.2-5). Based on a subsurface investigation report, the contamination appeared to be limited to an area approximately 700 feet northwest of the project site. Based on the relative distance between the release site and the project site, groundwater contamination from the release site is not expected to be encountered during project construction, and this release site is not discussed further.

Texaco Station No. 21-1345

In 1986, a release of petroleum from LUSTs was reported at the Texaco Station No. 21-1345 site (Site 09 on Figure 2.2-5). Based on the most recent groundwater monitoring activities, the petroleum contamination appears to be limited to an area approximately 1,600 feet southeast of the project site. Based on the relative distance between the release site and the project site, groundwater contamination from the release site is not expected to be encountered during project construction, and this release site is not discussed further.

Shell Station-32187 Alvarado Niles Rd

In 1986, a release of petroleum from LUSTs was reported at the Shell Station-32187 Alvarado Niles Rd site (Site 10 on Figure 2.2-5). Based on the most recent groundwater monitoring activities, the petroleum contamination appears to be limited to an area approximately 1,800 feet southeast of the project site. Based on the relative distance between the release site and the project site, groundwater contamination from the release site is not expected to be encountered during project construction, and this release site is not discussed further.

Reynolds Aluminum

In 1999, a release of chlorinated solvents was reported at the Reynolds Aluminum site (Site 11 on Figure 2.2-5). Based on the most recent groundwater monitoring activities, the edge of the chlorinated solvent groundwater plume appears to be located approximately 1,000 feet east of the project site. Based on the relative distance between the release site and the project site, groundwater contamination from the release site is not expected to be encountered during project construction, and this release site is not discussed further.

I-880 Interchange Improvements (Whipple Road-Industrial Parkway Southwest and Industrial Parkway West) Project



Hazardous Material Sites of Concern

Figure

2.2-5

Historic Land Uses in the Study Area

As early as 1939, the study area was predominantly being used for agriculture. By 1958, the mainline of the I-880 highway and the I-880/Whipple Road-Industrial Parkway Southwest Interchange had been built. A portion of the project site had been converted to a parking lot and container storage area, southeast of the current I-880/Industrial Parkway West Interchange. By 1968, the I-880/Industrial Parkway West Interchange had been built and large portions of the farmlands surrounding the project site had been converted to single-family residential, commercial, and light industrial land uses. By 1998, most of the remaining farmlands and vacant parcels adjacent to the project site had been converted to single-family residential, commercial, and light-industrial land uses. The land uses surrounding the project site and more broadly in the study area have not changed significantly since 1998.

Pesticides from Historic Agriculture

Prior to 1950, inorganic pesticides that contained elevated concentrations of metals such as arsenic were commonly used in California agriculture. After 1950, organochlorine pesticides (OCPs) were commonly used until about the mid-1970s. Arsenic from inorganic pesticides and residues from OCPs have the potential to persist for many decades in shallow soils and can affect human health and the environment. As a result, shallow soils within the study area may be contaminated with arsenic and OCPs.

Aerially Deposited Lead

ADL from the historical use of leaded gasoline, exists along roadways throughout California. If encountered, soil with elevated concentrations of lead as a result of ADL on the state highway system right of way within the limits of the project will be managed under the July 1, 2016, ADL Agreement between Caltrans and the California Department of Toxic Substances Control. This ADL Agreement allows such soils to be safely reused within the project limits as long as all requirements of the ADL Agreement are met.

Contamination from Railroad Corridors

The most commonly reported soil contamination along railroad corridors are metals and petroleum products from railroad operations. For example, elevated concentrations of arsenic are common in shallow soils from historical applications of inorganic herbicides and leaching from chemically-preserved railroad ties and/or arsenic-laced slag used as ballast material. Other sources of contaminants associated with historical railroad operations may include coal ash from engines and polynuclear aromatic hydrocarbons from diesel exhaust.

The risk of soil contamination is generally greater at rail yards and along railroad corridors that are adjacent to industrial areas where historical loading practices, leaks during material transfers or storage, and repair activities may have contaminated the soil.

A railroad corridor crosses the study area at Whipple Road west of the I-880/Whipple Road-Industrial Parkway Southwest Interchange and crosses beneath the I-880 corridor north of the I-880/Whipple Road-Industrial Parkway Southwest Interchange. No construction activities are proposed in these areas, other than improvements to Whipple Road where the former rail line has previously been removed. Therefore, contamination from rail corridors is not discussed further in this section.

ENVIRONMENTAL CONSEQUENCES

Build Alternatives

Based on existing conditions in the study area and the type and location of improvements proposed, hazardous material and waste concerns are the same for all Build Alternatives. As a transportation infrastructure project, hazardous wastes or materials would not be needed or used during operation of the Build Alternatives. The Build Alternatives would not place roadway users near hazardous facilities or hazardous material sites, or otherwise change the existing overall location of transportation facilities within the study area. Therefore, only construction-related effects are discussed below.

Hazardous Material Release Sites

As discussed in Affected Environment, 11 of the 44 release sites were closely evaluated to determine whether migrated contaminants could be encountered at the project site. Based on the characteristics of each release, only five are considered a potential risk for on-site contamination. Based on the type of hazardous materials release, all five sites have contaminated groundwater. If contaminated groundwater is encountered during construction, it could pose a risk to construction workers. Further, the exposure of contaminated groundwater to the surface creates the potential for further contamination. Table 2.2.5-2 summarizes the five release sites of potential concern.

Risks associated with encountering contaminated groundwater during construction would be avoided or minimized through implementation of Measure HAZ-1 and Measure HAZ 2. These measures would ensure that additional on-site groundwater testing is completed prior to construction, would provide project-specific worker safety measures, and would require detention of contaminated groundwater on-site during construction to avoid further spread of contaminants.

Table 2.2.5-2 Hazardous Materials Release Sites of Concern

Site No.	Site Name and Location	Summary of Potential Impacts
02	Conway Western Express, 2200 Claremont Court	In 1987, a release of diesel from a leaking fuel line was reported at the Conway Western Express site (Site 02 on Figure 2.2-5). This site is on the southwest side of the I-880/Industrial Parkway West Interchange, adjacent to proposed work areas for all Build Alternatives. Dual-phase extraction wells reportedly removed approximately 5,500 gallons of diesel fuel. In 1994, another release of diesel was reported during the removal of seven USTs along the building. Further extraction activities were performed, and the case was closed when it was determined that residual petroleum hydrocarbons did not pose a significant risk to public health. Groundwater monitoring activities in 2012 detected residual concentrations of petroleum hydrocarbons. Residual soil and groundwater contamination from the release site could be encountered during construction of the Build Alternatives.
04	Calaveras Cement, 30101 Industrial Parkway	In 1988, a release of petroleum from a leaking concrete septic vault was reported at the Calaveras Cement site (Site 04 on Figure 2.2-5). The case was closed because it did not appear that further monitoring, investigation, or remedial actions were necessary to protect the beneficial uses of the groundwater basin. Based on the most recent groundwater monitoring report, residual concentrations of diesel were detected in groundwater samples collected near the project site. Therefore, residual groundwater contamination could be encountered during construction of the Build Alternatives.

Site No.	Site Name and Location	Summary of Potential Impacts
05	Chevron #9-3142, 30151 Industrial Parkway Southwest	In 1994, a release of petroleum from leaking USTs was reported at the Chevron #9 site (Site 05 on Figure 2.2-5). The case was closed after site investigation and remediation activities were completed, and it was determined residual petroleum hydrocarbons did not pose a significant risk. Based on the most recent groundwater monitoring report, residual concentrations of petroleum were detected in groundwater samples collected adjacent to the project site. Therefore, residual groundwater contamination from the release site could potentially be encountered during construction of the Build Alternatives.
06	Mobil 10-LD2/BP 11269, 2492 Whipple Road	In 1998, a release of petroleum from leaking USTs was reported at the Mobil 10 site (Site 06 on Figure 2.2-5). Based on the most recent groundwater monitoring activities, a petroleum hydrocarbon plume extends north from the release site and crosses the project site at Whipple Road. Therefore, groundwater contamination from the release site could be encountered during construction of the Build Alternatives.
07	Crescent Truck Lines, 2480 Whipple Road	In 1987, a release of petroleum from LUSTs was reported at the Crescent Truck Lines site (Site 07 on Figure 2.2-5). A release of chlorinated solvents from an unknown source has also been reported on the site. Based on recent groundwater monitoring activities, the petroleum hydrocarbon plume extends north from the release site toward the Mobil 10-LD2/BP 11269 site. The chlorinated solvent plume extends north from the release site and crosses the project site. Therefore, groundwater contamination from the release site could be encountered during construction of the Build Alternatives.

Source: Phase I Initial Site Assessment

Pesticides from Historic Agriculture

The project site and surrounding area was predominantly used for agriculture as early as 1939, and therefore shallow soils at the project site may be contaminated with arsenic and OCPs. During construction, ground disturbing activities could expose construction workers to these soil contaminants, which would pose a health risk. Measure HAZ-3 would avoid this potentially adverse effect by requiring the preparation of a Site Safety Plan. The plan

would address site-specific risks and ensure risks to construction workers and the public are minimized.

Aerially Deposited Lead

Based on a review of historical aerial photographs of the study area, I-880 was constructed in the late 1950s before the phase-out of leaded gasoline. Therefore, ADL may be present in roadside soils at the project site. Ground disturbing construction activities could expose construction workers to ADL. This represents a potential health risk. Measure HAZ-1 and Measure HAZ-3 would avoid this potentially adverse effect. Measure HAZ-1 would require testing and evaluation of ADL and a determination on whether ADL-contaminated soils could be reused on site. Measure HAZ-3 requires the preparation of a Site Safety Plan. The plan would address site-specific risks including ADL and ensure risks to construction workers and the public are minimized.

Contaminated Soil in Fill Materials

Fill materials used for embankments within the study limits could have come from a variety of sources and may contain contaminants. Common contaminants in fill materials include asbestos, heavy metals, pesticides, and petroleum hydrocarbons. Therefore, construction of the Build Alternatives could potentially encounter contaminated soils in fill embankments. This represents a potential health risk to construction workers. Measure HAZ-3 would avoid this potentially adverse effect by requiring the preparation of a Site Safety Plan. The plan would address site-specific risks and ensure risks to construction workers and the public are minimized.

Hazardous Building Materials

Lead-based Paint and Asbestos-Containing Materials

Building materials such as thermal system insulation, surfacing materials, and asphalt and vinyl flooring materials installed prior to 1981 may contain asbestos. Lead compounds may also be present in interior or exterior paints regardless of construction date. Lead and asbestos are state-recognized carcinogens, and lead is a reproductive toxicant. Bridges and wall structures could contain asbestos materials and may have surfaces coated with lead-based paint. Demolition or modification of these structures could release lead particles and asbestos fibers (if present) into the environment. This presents a potential health risk to construction workers. Measure HAZ-4 would avoid this potentially adverse effect by requiring preconstruction survey of all structures that would be removed or modified, including bridges, under the Build Alternatives. Any hazardous building materials identified would be removed prior to construction.

Yellow Traffic Striping and Pavement Markers

Caltrans has historically used paints containing high levels of lead chromate for yellow traffic striping and pavement markings along roadways. Yellow traffic paints and yellow thermoplastic materials applied to roadways prior to 1997 and 2007, respectively, may contain lead concentrations above hazardous waste thresholds. Modification of the roadways with yellow traffic striping and pavement markings during construction could release lead chromate particles (if present) into the environment. This would pose a potential health risk to construction workers. Measure HAZ-5 would avoid this potentially adverse effect by requiring testing of yellow thermoplastics and paint prior to construction. Yellow markings would be treated as hazardous and removed in accordance with Caltrans Standard Special Provision 14 001 to ensure workers are not exposed to toxic substances.

Asphalt and Portland-Cement Concrete

Grindings of asphalt concrete and Portland-cement concrete have a relatively high pH and may contain metals and petroleum hydrocarbons that can impact stormwater runoff and threaten surface water bodies. Generation of asphalt concrete and Portland-cement concrete grindings during construction of the Build Alternatives pose a risk of releasing metals and petroleum hydrocarbons into the environment. Measure HAZ-6 would avoid this potentially adverse effect by ensuring grindings are reused and transported in accordance with RWQCCB guidelines to avoid contamination of stormwater or other surface waters.

No-Build Alternative

Under the No-Build Alternative, none of the project features described under the Build Alternatives would be constructed. No change to the existing interchange structures would be implemented, and there would be no excavation or other ground-disturbing activities. Therefore, the No-Build Alternative would not result in increased risks associated with hazardous materials or hazardous waste. The No-Build Alternative would have no effect related to this topic.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Measure HAZ-1: During the final design phase, a PSI of the project site shall be performed to investigate hazardous materials concerns related to soil, groundwater, and construction materials identified in the Phase 1 ISA.

- A workplan for the PSI shall be submitted to Alameda CTC and Caltrans for review and approval. The workplan shall include Caltrans guidance for evaluating the potential reuse of ADL-contaminated soils in accordance with the Caltrans and DTSC's Soil Management Agreement for Aerially Deposited Lead-Contaminated Soils.

- The completed PSI shall be submitted to Alameda CTC and Caltrans for review and approval.
- All environmental investigations completed for the project shall be provided to the project contractors to incorporate into their Health and Safety and Hazard Communication programs.
- Based on the findings and recommendations of the PSI, special soil, groundwater, and construction materials management and disposal procedures for hazardous materials may be required. Additionally, detailed construction worker health and safety measures may be required during construction.

The following components shall be included in the PSI:

- Representative soil and/or groundwater sampling shall be conducted by a licensed professional to evaluate the potential presence of hazardous materials in soil and groundwater as a part of the PSI. Sampling shall be performed in accordance with the work plan approved by Caltrans and Alameda CTC, and shall address the groundwater contamination concerns identified in Table 2.2.5-2 of the IS/EA.
- Soil samples collected to evaluate ADL shall be analyzed for total lead and soluble lead to evaluate whether the Department of Toxic Substances Control's variance issued to Caltrans could apply. If applicable, the variance would determine whether the lead-affected soils could be reused as fill within the project limits.
- Soil and groundwater analytical results shall also be screened against the San Francisco Bay RWQCB's Environmental Screening Levels to determine appropriate actions to ensure construction worker protection and the protection of future site users and the environment. Samples shall also be screened against hazardous waste thresholds to determine soil management options.

If soil and/or groundwater contaminants are found, the regulatory authorities (federal, state or local) may require that the soils be removed or specially managed through hazardous waste closure plans, implementation of contingency plans, remediation orders, permits, or other administrative actions. The responsible party (i.e., property owner of the contaminated area) would comply with the instructions in those plans, orders, permits, or actions. Based on the areas of groundwater concern identified in the IS/EA, implementation of special soil and/or groundwater remediation and handling efforts during construction is anticipated to cost approximately \$250,000.

Implementation of subsurface sampling for the entire project site is anticipated to cost approximately \$200,000. The soil and groundwater sampling would likely be a three-month endeavor, assuming property access and approval of the work plan is obtained in a timely fashion.

Measure HAZ-2: At a minimum, groundwater from dewatering of excavations, if any, would be stored in Baker tank(s) during construction activities and the water would be characterized prior to disposal or recycling. Similarly, excavated soil would be stockpiled for waste characterization and testing. This would be in addition to the pre-characterization of groundwater quality during the Preliminary Site Investigation.

Measure HAZ-3: In accordance with Caltrans protocol, a Site Safety Plan shall be prepared and implemented prior to initiation of any construction/development activities to reduce health and safety hazards to workers and the public. In accordance with Caltrans' Standard Special Provision 07-330, the contractor shall be required to prepare a Lead Compliance Plan to prevent or minimize worker exposure.

Lead Compliance Plan measures to address ADL could include removing ADL soil, and/or balancing soil removal and fill to maximize reuse of ADL soil in the project limits without generating hazardous waste. Handling of material containing ADL must result in no visible dust migration. An effective means of controlling dust must always be available when handling material in work areas containing ADL at hazardous waste concentrations.

Measure HAZ-4: Hazardous building materials surveys shall be conducted by a qualified professional. All structures that would be removed or modified, including bridges, shall be inspected. Lead-based paint and asbestos-containing material shall be included in the hazardous materials building surveys. All loose and peeling lead-based paint and asbestos-containing material shall be removed by a certified contractor(s) in accordance with local, state, and federal requirements. All other hazardous building materials shall be removed from structures in accordance with California OSHA regulations.

Measure HAZ-5: Yellow thermoplastic and yellow paint striping and markings on existing roadways shall be analyzed for lead chromate prior to disturbance or removal in accordance with Chapter 7 of Caltrans' Construction Manual. Yellow stripe and pavement markings shall also be treated as a hazardous waste; a Lead Compliance Plan shall be implemented, and residues shall be tested for hazardous-waste classification prior to off-site disposal. This work shall be completed in accordance with Caltrans Standard Special Provision 14 001.

Measure HAZ-6: Asphalt-concrete and Portland-cement concrete grindings shall be reused in accordance with San Francisco Bay RWQCB guidelines for Caltrans' projects or transported offsite for recycling or disposal.

Cumulative Impacts

Cumulative impacts arise due to the linking of impacts from past, present, and foreseeable future projects in the region. Effects from hazardous waste and materials related to future development in areas surrounding the project limits are site specific and relate to the type and location of construction proposed, as well as the environmental concerns associated with known hazardous material release sites within the project limits. There is no additive effect of the hazardous or waste materials associated with other approved or foreseeable development and the project, and therefore no cumulative effect.

2.2.6 AIR QUALITY

This section discusses temporary and long-term effects to air quality that could result from the project. Information in this section is primarily drawn from the *Air Quality Report* (AQR) prepared for the project.

REGULATORY SETTING

Federal and State

The Federal Clean Air Act (FCAA), as amended, is the primary federal law that governs air quality while the California Clean Air Act (CCAA) is its companion state law. These laws, and related regulations by the U.S. EPA and the California Air Resources Board (CARB), set standards for the concentration of pollutants in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). NAAQS and state ambient air quality standards have been established for six transportation-related criteria pollutants that have been linked to potential health concerns: carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particulate matter (PM)—which is broken down for regulatory purposes into particles of 10 micrometers or smaller (PM₁₀) and particles of 2.5 micrometers and smaller (PM_{2.5})—and sulfur dioxide (SO₂). In addition, national and state standards exist for lead (Pb), and state standards exist for visibility reducing particles, sulfates, hydrogen sulfide (H₂S), and vinyl chloride. The NAAQS and state standards are set at levels that protect public health with a margin of safety, and are subject to periodic review and revision. Both state and federal regulatory schemes also cover toxic air contaminants (air toxics); some criteria pollutants are also air toxics or may include certain air toxics in their general definition.

Federal air quality standards and regulations provide the basic scheme for project-level air quality analysis under NEPA. In addition to this environmental analysis, a parallel “Conformity” requirement under the FCAA also applies.

Conformity

The conformity requirement is based on FCAA Section 176(c), which prohibits the USDOT and other federal agencies from funding, authorizing, or approving plans, programs, or projects that do not conform to State Implementation Plan (SIP) for attaining the NAAQS. “Transportation Conformity” applies to highway and transit projects and takes place on two levels: the regional (or planning and programming) level and the project level. The proposed project must conform at both levels to be approved.

Conformity requirements apply only in nonattainment and “maintenance” (former nonattainment) areas for the NAAQS, and only for the specific NAAQS that are or were violated. U.S. EPA regulations at 40 CFR 93 govern the conformity process. Conformity requirements do not apply in unclassifiable/attainment areas for NAAQS and do not apply at all for state standards regardless of the status of the area.

Regional conformity is concerned with how well the regional transportation system supports plans for attaining the NAAQS for CO, NO₂, O₃, PM₁₀, PM_{2.5}, and NO_x and, and in some areas (although not in California), SO₂. California has nonattainment or maintenance areas for all of these transportation-related “criteria pollutants” except SO₂, and also has a nonattainment area for Pb; however, lead is not currently required by the FCAA to be covered in transportation conformity analysis. Regional conformity is based on emission analysis of RTPs and Federal Transportation Improvement Programs (FTIPs) that include all transportation projects planned for a region over a period of at least 20 years (for the RTP) and 4 years (for the FTIP). RTP and FTIP conformity uses travel demand and emission models to determine whether or not the implementation of those projects would conform to emission budgets or other tests at various analysis years showing that requirements of the FCAA and the SIP are met. If the conformity analysis is successful, the Metropolitan Planning Organization (MPO), FHWA, and Federal Transit Administration (FTA) make the determinations that the RTP and FTIP are in conformity with the SIP for achieving the goals of the FCAA. Otherwise, the projects in the RTP and/or FTIP must be modified until conformity is attained. If the design concept and scope and the “open-to-traffic” schedule of a proposed transportation project are the same as described in the RTP and FTIP, then the proposed project meets regional conformity requirements for purposes of project-level analysis.

Project-level conformity is achieved by demonstrating that the project comes from a conforming RTP and TIP; the project has a design concept and scope that has not changed significantly from those in the RTP and TIP; project analyses have used the latest planning assumptions and U.S. EPA-approved emissions models; and in PM areas, the project complies with any control measures in the SIP. Furthermore, additional analyses (known as

hot-spot analyses) may be required for projects located in CO and PM nonattainment or maintenance areas to examine localized air quality impacts.

LOCAL REGULATIONS

San Francisco Bay Area Air Basin

The San Francisco Bay Area Air Basin (SFBAAB) encompasses approximately 5,600 square miles and includes all of Alameda, Contra Costa, Marin, Napa, San Francisco, Santa Clara, and San Mateo counties, and portions of Solano and Sonoma counties. BAAQMD and CARB have joint responsibility for developing and enforcing regulations needed to achieve and maintain NAAQS and California Ambient Air Quality Standards (CAAQS) in the SFBAAB.

Bay Area Air Quality Management District

BAAQMD has a range of responsibilities for monitoring, maintaining, and improving air quality. BAAQMD prepares and administers attainment and maintenance plans for ambient air quality, creates and enforces rules and regulations, issues permits for stationary sources of air pollution, inspects stationary sources, monitors ambient air quality and meteorological conditions, awards grants to reduce motor vehicle emissions, and conducts public education campaigns.

BAAQMD developed the 2017 Bay Area Clean Air Plan (2017 CAP) in cooperation with MTC and ABAG. MTC and ABAG estimate future population and transportation trends which are used to develop and evaluate Community Climate Action Plan (CAP) strategies. The overall goal of these strategies is to bring the SFBAAB into compliance with NAAQS and CAAQS. The 2017 CAP addresses four categories of pollutants: ground-level ozone and its key precursors, reactive organic gasses (ROG) and NO_x; particulate matter, primarily PM_{2.5}; key air toxics such as diesel particulate matter and benzene; and key greenhouse gasses (GHGs).

AFFECTED ENVIRONMENT

Information in this section is based on the *Air Quality Report*. The project site is in the Southwestern Alameda County climatological subregion of the SFBAAB, which is overseen by BAAQMD. The air quality study area for long-term effects includes the entirety of the Southwestern Alameda County subregion. The regional air quality study area includes the freeway mainline segments for the I-880 interchanges at Tennyson Road, Industrial Parkway, Whipple Road, and Alvarado-Niles Road; the ramp terminal intersections at the four interchanges; and 15 key intersections located on the major arterials connecting the four interchanges.

Climate and Topography

Air basins have physical characteristics that determine the ability of natural processes to dilute or transport air pollutants. Climatic and topographic factors such as wind, atmospheric stability, terrain that influences air movement, and sunshine all play a role in the dilution and transport of air pollutants within an air basin.

The climate within the air quality study area is affected by proximity to the Pacific Ocean and the San Francisco Bay, which has a moderating influence. The Bay Area has a Mediterranean climate characterized by wet winters and dry summers. During the summer, a high-pressure cell over the northeastern Pacific Ocean results in stable meteorological conditions and a steady northwesterly wind flow that keep storms from affecting the California coast. Southwestern Alameda County is indirectly affected by marine air flow. Marine air entering through the Golden Gate is blocked by the East Bay hills, forcing the air to diverge into northerly and southerly paths. The southern flow is directed down the bay, parallel to the hills, where it eventually passes over southwestern Alameda County. During the summer months, average temperatures range from the mid-50s to mid-70s (Fahrenheit). During the winter months, average temperatures range from the low 40s to low 60s (Fahrenheit).

Pollution potential is relatively high in southwestern Alameda County during the summer and fall. When high pressure dominates, low mixing depths and Bay and ocean wind patterns can concentrate and carry pollutants from other cities to this area, adding to the locally-generated pollutant mix. The polluted air is then pushed up against the East Bay hills. In the wintertime, the air pollution potential in southwestern Alameda County is moderate. Air pollution sources include light and heavy industry and motor vehicles.

Air Pollutants

The primary air pollutants of concern from motor vehicles are ground-level ozone formed through reactions of NO_x and ROG, PM₁₀, and PM_{2.5}. In addition to criteria air pollutants, local MSAT emissions are a concern for nearby receptors, and GHG emissions are a regional concern for climate change. These primary air pollutants of concern are discussed further below.³¹

Ozone

Motor vehicles do not emit ozone directly into the environment, but tailpipe emissions undergo complex chemical reactions in the presence of sunlight, which result in the

³¹ Environmental Protection Agency, 2019. *Criteria Air Pollutants*. Available online at: <https://www.epa.gov/criteria-air-pollutants>; last accessed: October 2019

formation of ozone. The primary chemicals involved in these reactions are NO_x and ROG, often referred to as ozone precursors. Ozone precursors may come from sources other than motor vehicles, but the largest manmade source in the SFBAAB is motor vehicle exhaust. Ozone exposure causes eye irritation and damage to lung tissue in humans. Ozone also harms vegetation, reduces crop yields, and accelerates deterioration of paints, finishes, rubber products, plastics, and fabrics.

Carbon Monoxide

CO is an odorless, colorless gas usually formed as the result of the incomplete combustion of fuels. The single largest source of CO is motor vehicles. CO disperses with distance from the source under normal meteorological conditions. However, under certain extreme meteorological conditions, CO concentrations near congested roadways or intersections may reach unhealthy levels that adversely affect local sensitive receptors. Typically, high CO concentrations are associated with roadways or intersections operating at unacceptable LOS or with extremely high traffic volumes. Exposure to high concentrations of CO reduces the oxygen-carrying capacity of the blood and can cause headaches, nausea, dizziness, and fatigue; impair central nervous system function; and induce chest pain in persons with serious heart disease. Very high levels of CO can be fatal.

Nitrogen Dioxide

NO_2 is a byproduct of fossil fuel combustion. Automobiles and industrial operations are the main sources of NO_2 . Aside from its contribution to ozone formation, NO_2 also contributes to other pollution problems including a high concentration of fine particulate matter, poor visibility, and acid deposition. NO_2 may be visible as a coloring component on high pollution days, especially in conjunction with high ozone levels. NO_2 decreases lung function and may reduce resistance to infection.

Sulfur Dioxide

SO_2 is a colorless, irritating gas formed primarily from incomplete combustion of fossil fuels containing sulfur. Industrial facilities also contribute to SO_2 levels in the region. SO_2 irritates the respiratory tract, can injure lung tissue when combined with fine particulate matter, and reduces visibility and the level of sunlight.

Particulate Matter

PM_{10} and $\text{PM}_{2.5}$ consist of extremely small, suspended particles or droplets that are 10 microns and 2.5 microns or smaller in diameter, respectively. Some sources of particulate matter, like pollen, forest fires, and windblown dust, are naturally occurring. In populated areas, most particulate matter is caused by road dust, combustion products, abrasion of

tires and brakes, and construction activities. Secondary particulate matter can also be formed in the atmosphere through condensation and chemical reactions of inorganic gases and ROG.

Particulate matter exposure can affect breathing, aggravate existing respiratory and cardiovascular disease, alter the body's defense systems against foreign materials, and damage lung tissue, contributing to cancer and premature death. Individuals with chronic obstructive pulmonary or cardiovascular disease, asthmatics, the elderly, and children are most sensitive to the effects of particulate matter.

Lead

Lead is a metal found naturally in the natural environment as well as in manufactured products. The major sources of lead emissions have historically been mobile and industrial sources. Twenty years ago, mobile sources were the main contributor to ambient lead concentrations in the air. In the early 1970s, the U.S. EPA established national regulations to gradually reduce the lead content in gasoline. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. The U.S. EPA banned the use of leaded gasoline in highway vehicles in 1995. As a result of the U.S. EPA's regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector and levels of lead in the air decreased dramatically. Metal processing is currently the primary source of lead emissions, with the highest levels of lead in the air generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufactures.

Mobile Source Air Toxics

MSATs include a diverse group of air pollutants that can adversely affect human health. Unlike criteria air pollutants, which generally affect regional air quality, MSAT emissions are evaluated based on estimations of localized concentrations and risk assessments. The adverse health effects a person may experience following exposure to any chemical depend on several factors, including the amount, duration, chemical form, and any simultaneous exposure to other chemicals.

The U.S. EPA's Integrated Risk Information System (IRIS) includes 93 hazardous air pollutants emitted from mobile sources. Based on the U.S. EPA's 2011 national-scale Air Toxics Assessment, nine of these compounds are considered significant national and regional-scale cancer risk drivers or contributors and/or non-cancer hazard contributors. These are acetaldehyde, acrolein, benzene, 1,3-butadiene, diesel particulate matter, ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter. While the FHWA considers these nine compounds the priority MSATs, the list is subject to change and may be adjusted in consideration of future U.S. EPA rules.

The I-880 corridor, Industrial Parkway West, Industrial Parkway Southwest, Whipple Road, Dye Street, and Alvarado Nile Road are the primary sources of MSATs at the project site, with traffic volumes that currently exceed 10,000 annual average daily traffic (AADT). The I-880/Whipple Road-Industrial Parkway Southwest and I-880/Industrial Parkway West interchanges provide freeway access to the City of Hayward ITI Corridor, which includes a variety of warehouse and distribution facilities, food manufacturing companies, biotechnology firms, and high technology businesses. Congestion and delay in the project limits adversely affect efficient goods movement to and from the ITI Corridor, which increases MSAT emissions due to increased VMT from traffic diversion onto the local street network. The existing and forecasted traffic conditions in the project limits are summarized in the *Air Quality Report*.

Sensitive Receptors

Some groups of people are more affected by air pollution than others. These groups are known as sensitive receptors. The state has identified the following groups of people who are most likely to be affected by air pollution: children under 16, the elderly over 65, people conducting athletic activities, and people with cardiovascular and chronic respiratory diseases. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, outdoor athletic fields, and elementary schools.

No schools, parks, hospitals, or convalescent homes are located within 500 feet of the project site. Residential single-family homes are immediately northeast and northwest of the I-880/Industrial Parkway West Interchange, and immediately west and southeast of the I-880/Whipple Road-Industrial Parkway Southwest Interchange.

Regional Air Quality Attainment Status

The state and federal attainment status for all regulated pollutants in the SFBAAB are summarized in Table 2.2.6-1. The SFBAAB is currently designated a marginal nonattainment area for the 2008 and 2015 federal 8-hour ozone standard, moderate nonattainment for the 2006 federal 24-hour PM_{2.5} standard, and nonattainment for the state ozone, PM₁₀, and PM_{2.5} standards. The SFBAAB is classified as attainment or unclassifiable for the remaining NAAQS and CAAQS. Unclassifiable generally indicates that there is a lack of representative data to classify a basin.

Table 2.2.6-1 State and Federal Attainment Status in the San Francisco Bay Area Air Basin

Pollutant	State Attainment Status	Federal Attainment Status
Ozone (O ₃)	Nonattainment	Nonattainment (Marginal)
Respirable Particulate Matter (PM ₁₀)	Nonattainment	Unclassifiable/Attainment
Fine Particulate Matter (PM _{2.5})	Nonattainment	Nonattainment (Moderate)
Carbon Monoxide (CO)	Attainment	Attainment (Maintenance)
Nitrogen Dioxide (NO ₂)	Attainment	Unclassifiable/Attainment
Sulfur Dioxide (SO ₂)	Attainment	Unclassifiable/Attainment
Lead (Pb)	Attainment	Unclassifiable/Attainment
Visibility-Reducing Particles	Unclassified	N/A
Sulfates	Attainment	N/A
Hydrogen Sulfide	Unclassified	N/A
Vinyl Chloride	No Information Available	N/A

Source: Baseline Environmental Consulting, 2019

N/A = Not Applicable

ENVIRONMENTAL CONSEQUENCES

Build Alternatives

Because operational traffic conditions would be the same for each Build Alternative, operational air quality effects would be similar across all Build Alternatives. Therefore, all Build Alternatives are discussed holistically for operational air quality analysis. Conversely, construction-period emissions would vary between Build Alternatives based on the differences in ramps and other structures. Therefore, where appropriate, construction-period emissions have been calculated for each Build Alternative.

The project is listed in the Plan Bay Area 2040 financially constrained RTP (ID 17-01-0023 and ID 17-01-0021) which was found to conform by MTC on September 26, 2018, and FHWA and FTA made a regional conformity determination finding on December 17, 2018. The project is also included in MTC's financially constrained 2019 Regional TIP (ID ALA110002 and ID ALA170005). The MTC 2019 Regional Transportation Improvement Program was determined to conform by FHWA and FTA on December 17, 2018. The design concept and scope of the project is consistent with the project description in the 2019 RTP and RTIP, and the "open to traffic assumptions of the MTC's regional emissions analysis.

Construction

Emissions for Project-Level Conformity

For conformity purposes, 40 CFR 93.123(c)(5) states:

"CO, PM₁₀, and PM_{2.5} hot-spot analyses are not required to consider construction-related activities which cause temporary increases in emissions. Each site which is affected by construction-related activities shall be considered separately, using established 'Guideline' methods. Temporary increases are defined as those which occur only during the construction phase and last five years or less at any individual site."

Because construction of all Build Alternatives is expected to last less than five years, temporary emissions of CO, PM₁₀, and PM_{2.5} are not expected to cause or contribute to, or worsen, any federal air quality violations and an evaluation of these emissions is not required for a project-level conformity determination.

Criteria Air Pollutant Emissions

Project construction activities would generate emissions of criteria air pollutants and precursors that could potentially affect regional air quality. According to BAAQMD, the primary pollutant emissions of concern during project construction would be ROG, NO_x, PM₁₀, and PM_{2.5} from the exhaust of off-road construction equipment and on-road construction vehicles (worker vehicles, vendor trucks, and haul trucks). Construction emissions for each Build Alternative were quantified using the Sacramento Metropolitan Air Quality Management District’s Roadway Construction Emissions Model (RCEM Version 8.1.0). The Build Alternatives would involve standard construction techniques and require large-scale construction equipment and labor-intensive activities. Construction is anticipated to begin in Spring 2023 and would take approximately 32 months.

The total emissions estimated for Build Alternative 1, Build Alternative 1 with Design Variation 1, Build Alternative 2, and Build Alternative 3 varied primarily due to differences in the magnitude of proposed bridge improvements. The estimated average daily emissions from construction of the Build Alternatives are summarized in Table 2.2.6-2 and detailed model outputs are included in the *Air Quality Report*.

Table 2.2.6-2 Construction Criteria Air Pollutant Emissions (Average Pounds per Day)

Emissions Scenario	ROG	NO _x	Exhaust PM ₁₀	Exhaust PM _{2.5}	Fugitive Dust PM ₁₀	Fugitive Dust PM _{2.5}
Build Alternative 1	5	40	2	2	28	6
Build Alternative 1 with Design Variation 1	3	26	1	1	28	6
Build Alternative 2	5	47	2	2	28	6
Build Alternative 3	5	40	2	2	28	6
BAAQMD Recommended Thresholds ¹	54	54	82	54	BMP	BMP

Source: Baseline Environmental Consulting, 2019

¹BAAQMD’s thresholds have not been adopted by Caltrans and are only shown for informational purposes.

Fugitive dust emissions include a 50 percent reduction from the use of watering trucks. However, additional reductions from implementation of dust-control measures listed under Section 5 cannot be readily quantified.

BAAQMD = Bay Area Air Quality Management District; BMP = best management practices

Projected emissions are based on defaults for construction equipment and duration phases as provided in RCEM, OFFROAD2011, and EMFAC2014. See the *Air Quality Report* for details regarding specific methodology used to generate construction period criteria pollutants. Air pollutants of primary concern, including ozone and particulate matter, are discussed further below.

Ozone

As shown in in Table 2.2.6-2, average daily emissions for each Build Alternative would be below BAAQMD's recommended thresholds for ROG and NO_x. Since the average daily emissions of ozone precursors from equipment and vehicle exhaust would be below the recommended thresholds, construction would not be expected to cause or contribute to, or worsen, any state air quality violations.

Particulate Matter

As shown in Table 2.2.6-2, average daily emissions for each Build Alternative would be below BAAQMD's recommended thresholds for Exhaust PM₁₀ and PM_{2.5}. Since the average daily emissions of criteria pollutants from equipment and vehicle exhaust would be below the recommended thresholds, construction would not be expected to cause or contribute to, or worsen, any state air quality violations.

Neither Caltrans nor BAAQMD have a quantitative threshold for fugitive dust emissions; however, BAAQMD considers implementation of BMPs to control fugitive dust, PM₁₀, and PM_{2.5} during construction sufficient to avoid and adverse effect. Caltrans' Special Provisions and Standard Specifications will include the requirement to minimize or eliminate dust through the application of water or dust palliatives, as described in below under Avoidance, Minimization, and/or Mitigation Measures.

Operation

Regional Conformity

The project is included in MTC's current RTP, Plan Bay Area 2040. The I-880/Industrial Parkway West Interchange improvement is included in the RTP under reference number ID 17-01-0023. This improvement is also included in the MTC 2019 TIP under reference number ID ALA110002. The I-880/Whipple Road-Industrial Parkway Southwest Interchange improvement is included in the RTP under reference number ID 17-01-0021. This improvement is also included in the MTC 2019 TIP under reference number ID ALA170005. MTC adopted the 2019 TIP on September 26, 2018. FHWA approved and incorporated the TIP into the Federal Statewide Transportation Improvement Program on December 17, 2018. The RTP and TIP listings for the project are included in the *Air Quality Report*. Therefore, the Build Alternatives would be in conformity with regional air quality

planning and would not cause or contribute to, or worsen, any violations of the federal air quality standards.

Project Level-Conformity

The project is located in a federal nonattainment area for ozone and PM_{2.5} and, therefore, a project-level conformity analysis of operational emissions is required to address these pollutants under 40 CFR 93. As of June 1, 2018, the transportation conformity requirements under FCAA Section 176(c) for CO maintenance areas in SFBAAB no longer apply for CO NAAQS.³²

Ozone Emissions Analysis

- The SFBAAB is currently designated as a federal nonattainment area for ozone. Because ozone impacts are regional in nature, projects that are included in an RTP and TIP have already undergone regional conformity analysis and do not require further analysis for a project-level conformity determination. As described above, this project is included in a conforming RTP and TIP, and therefore emissions of ozone precursors from project-related traffic are not anticipated to cause or contribute to, or worsen, any violations of the federal air quality standards for ozone.
- In addition, BAAQMD adopted the 2017 CAP to achieve compliance with federal and state ozone standards. Implementation of the Build Alternatives would not interfere with the control measures described in the 2017 CAP. Furthermore, the Build Alternatives would provide transportation benefits that reduce pollutant emissions, including ozone precursors, by improving traffic operations and efficiency and by providing bicycle and pedestrian amenities to promote active transportation.

PM_{2.5} Emissions Analysis

A quantitative particulate matter hot-spot analysis is required for transportation projects in a federal nonattainment or maintenance area for PM_{2.5} and is determined to be a Project of Air Quality Concern (POAQC) as defined in Title 40 CFR Part 93. The SFBAAB is currently designated as a federal nonattainment area for PM_{2.5}; therefore, a PM_{2.5} hot-spot analysis is required if the project is determined to be a POAQC.

However, on April 25th, 2019, the Bay Area Air Quality Conformity Task Force determined that the project is not a POAQC, and a detailed PM_{2.5} hot-spot analysis is not required for a

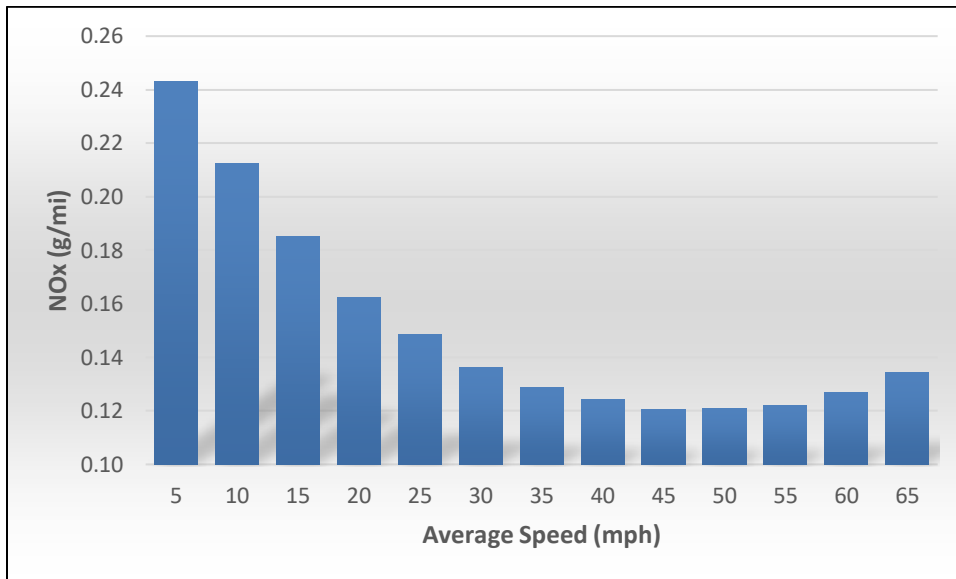
³² Adams, Elizabeth J. (Acting Director, Air Division, Environmental Protection Agency). Letter to: Muhaned Aljabiry, Chief. (Office of Federal Transportation Management Program California Department of Transportation). 2018 Mar 21.

project-level conformity determination. Therefore, the Build Alternatives would not be expected to cause or contribute to, or worsen, any violations of the federal air quality standards for PM_{2.5}. The Project Assessment Form for PM_{2.5} Interagency Consultation and the Air Quality Conformity Task Force determination are included in the *Air Quality Report*.

Operational Criteria Air Pollutant Emissions

- Operation of the Build Alternatives would generate criteria air pollutant emissions and precursors that could potentially affect regional air quality. Operational emission calculations provided in this section consider long-term changes in emissions that would result from the Build Alternatives. According to BAAQMD, the primary criteria air pollutant emissions of concern during project operation would be ROG, NO_x, PM₁₀, and PM_{2.5} from the exhaust of on-road vehicles. Criteria air pollutant emissions from operation of the Build Alternatives were estimated for the existing conditions (2018), and the No-Build and Build Alternatives during the opening year (2025), horizon year (2040), and design year (2045).
- One of the main strategies to reduce criteria pollutant emissions is to make transportation systems more efficient. The efficiency of transportation systems can be achieved by reducing VMT and/or improving the flow of traffic. As shown in Figure 2.2-6 below, the highest levels of NO_x emissions from mobile sources generally occur at speeds from 0 to 30 miles per hour. Therefore, by enhancing operations and improving travel times in high congestion travel corridors, NO_x emissions can be reduced.

Figure 2.2-6 NO_x Emissions Based on Vehicle Speed



Emission factors based on gasoline light-duty trucks for 2018.

Source: EMFAC, 2017

g/mi = grams per mile; mph = mile per hour

- As the Build Alternatives would alleviate local traffic congestion and reduce regional VMT, daily emissions of criteria air pollutants would generally decrease under the Build Alternatives when compared to the No-Build Alternative. As shown in Table 2.2.6-3, the estimated daily ROG and NO_x emissions for the Build Alternatives during both the opening year (2025), horizon year (2040), and design year (2045) scenarios would be approximately equal to or lower than the emissions for the No-Build Alternative, because the Build Alternatives would improve traffic flow and reduce regional VMT. Emissions for both the Build and No-Build alternatives would also be lower in the opening year (2025), horizon year (2040), and design year (2045) compared to the existing year (2018), because federal and state vehicle emissions standards are expected to reduce pollutant emissions over time.
- In conclusion, the modeling results show that the Build Alternatives would not result in an increase in criteria air pollutant emissions compared to the existing year conditions or the future No-Build Alternative. Therefore, emissions of criteria pollutants from project-related traffic are not anticipated to cause or contribute to, or worsen, any air quality violations.

Table 2.2.6-3 Operational Ozone Precursors Emissions (Pounds per Day)

Pollutant	2018 Existing	2025 No Build	2025 Build Alternatives	2040 No Build	2040 Build Alternatives	2045 No Build	2045 Build Alternatives
ROG	399	286	286	216	216	204	204
NO _x	2,028	815	813	562	561	531	530
PM ₁₀ Exhaust	22	10.3	10.3	6.0	6.0	5.5	5.5
PM _{2.5} Exhaust	21	9.6	9.6	5.7	5.6	5.1	5.1

Source: Baseline Environmental Consulting, 2019

Emissions would be the same for each build scenario. Traffic data for the design year (2045) was used to conservatively estimate emissions during the horizon year (2040). ROG = reactive organic gas; NO_x = nitrogen oxide; PM₁₀ = particulate matter 10 micrometers or less; PM_{2.5} = particulate matter 2.5 micrometers or less

Mobile Source Air Toxics Analysis

As a result of technical shortcomings in air quality models and uncertain science with respect to health effects, it is not possible to generate meaningful or reliable estimates of MSAT emissions or effects for each Build Alternative. Therefore, the impact analysis of MSAT emissions herein is incomplete and notes where information was unavailable. Although reliable methods do not exist to accurately estimate the health impacts of MSAT by Build Alternative, it is possible to estimate MSAT emissions for a holistic Build Alternative and the No-Build Alternative. Potential air quality effects related to operational emissions of MSAT were evaluated in accordance with the FHWA's (2016) Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents (40 CFR 1502.22). FHWA identified three levels of analysis:

- Category 1 Projects are projects with No Meaningful Potential MSAT Effects or Exempt Projects. The types of projects included in this category are projects qualifying as a categorical exclusion under 23 CFR 771.117(c); projects exempt under the FCAA conformity rule under 40 CFR 93.126; or other projects with no meaningful impacts on traffic volumes or vehicle mix.
- Category 2 Projects are projects with Low Potential MSAT Effects. The types of projects included in this category are those that serve to improve operations of highway, transit, or freight without adding substantial new capacity or without creating a facility that is likely to meaningfully increase MSAT emissions.

- Category 3 Projects are projects with Higher Potential MSAT Effects. This category includes projects that have the potential for meaningful differences in MSAT emissions among project alternatives.

The project would improve traffic operations in a populated area with nearby sensitive receptors. Traffic volumes along I-880 range from approximately 210,000 to 238,000 AADT under the existing (2018) conditions. According to FHWA guidance, the project has a high potential for MSAT effects because it's in proximity to populated areas and exceeds the FHWA's AADT threshold. Therefore, FHWA guidance recommends a quantitative analysis to forecast and compare local-specific emission trends of the priority MSAT for each alternative. As discussed above, it was not feasible to model each Build Alternative individually, however, a combined Build Alternative was modeled and is compared to the No-Build Alternative.

A quantitative analysis of daily emissions was performed for the nine priority MSATs using the Caltrans CT-EMFAC2014 model and Caltrans Ethylbenzene Emissions Calculator to compare the potential effects of the Build Alternatives and No-Build Alternative.

Like criteria air pollutants, one of the main strategies to reduce MSAT emissions is to make transportation systems more efficient. This can be achieved by reducing VMT and/or improving the flow of traffic. As the Build Alternatives would alleviate local traffic congestion and reduce regional VMT, daily emissions of MSAT pollutants would generally decrease with implementation of the Build Alternatives when compared to the No-Build Alternative.

As shown in Table 2.2.6-4, the estimated daily MSAT emissions for the Build Alternatives during the opening year (2025), horizon year (2040), and design year (2045) scenarios would be approximately equal to or lower than the emissions for the No-Build Alternative, because the Build Alternatives would improve local traffic flow and reduce regional VMT. Emissions for both the Build and No-Build Alternatives would also be lower in the opening year (2025), horizon year (2040), and design year (2045) compared to the existing year (2018), because federal and state vehicle emissions standards are expected to reduce pollutant emissions over time. In conclusion, the modeling results show that the Build Alternatives would not result in an increase in MSAT emissions compared to the existing year conditions or the future No-Build Alternative.

Table 2.2.6-4 Operational MSAT Emissions (grams per day)

Pollutant	2018 Existing	2025 No Build	2025 Build Alternatives	2040 No Build	2040 Build Alternatives	2045 No Build	2045 Build Alternatives
Benzene	3,483	2,379	2,374	1,981	1,978	1,908	1,906
Acrolein	105	68.5	68.4	58.0	57.9	55.5	55.5
Acetaldehyde	2,066	1,338	1,335	1,686	1,684	1,683	1,680
Formaldehyde	4,892	3,159	3,153	3,767	3,762	3,750	3,745
Butadiene	504	325	325	288	287	283	283
Naphthalene	214	157	157	118	118	111	111
Polycyclic Organic Matter	113	66.6	66.5	56.9	56.9	54.5	54.4
Diesel Particulate Matter	7,343	1,980	1,976	1,322	1,320	1,239	1,237
Ethylbenzene	2,603	1,897	1,894	1,359	1,357	1,272	1,270

Source: Baseline Environmental Consulting, 2019

Emissions would be the same for each build scenario. Traffic data for the design year (2045) was used to conservatively estimate emissions during the horizon year (2040).

Incomplete or Unavailable Information for Project-Specific MSAT Health Impacts Analysis According to the FHWA, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of Build Alternatives. The outcome of such an assessment, adverse or not,

would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The U.S. EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the FCAA and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The U.S. EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the IRIS, which is “a compilation of electronic reports on specific substances found in the

environment and their potential to cause human health effects.”³³ Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). A number of HEI studies are summarized in Appendix D of FHWA’s Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents.³⁴ Among the adverse health effects linked to MSAT compounds at high exposures are: cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations or in the future as vehicle emissions substantially decrease.³⁵

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts – each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

³³ Environmental Protection Agency, 2020. Integrated Risk Information System. Available online at: <https://www.epa.gov/iris/>; last accessed: February 25, 2020.

³⁴FHWA, 2016. Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents. Available online at: https://www.fhwa.dot.gov/environMent/air_quality/air_toxics/policy_and_guidance/msat/; last accessed: February 23, 2020.

³⁵Health Effects Institute, 2007. Mobile-Source Air Toxics: A Critical Review of the Literature on Exposure and Health Effects. Available online at: <https://www.healtheffects.org/publication/mobile-source-air-toxics-critical-review-literature-exposure-and-health-effects>; last accessed: February 26, 2020.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI.³⁵ As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The U.S. EPA states that with respect to diesel engine exhaust, “[t]he absence of adequate data to develop a sufficiently confident dose-response relationship from the epidemiologic studies has prevented the estimation of inhalation carcinogenic risk.”³³

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the U.S. EPA as provided by the FCAA to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires the U.S. EPA to determine an “acceptable” level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld the U.S. EPA’s approach to addressing risk in its two-step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable.³⁶

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, improving traffic operations and safety, and improving access for bicycles and pedestrians, that are better suited for quantitative analysis.

³⁶ U.S. Court of Appeals, 2008. Natural Resources Defense Council v. Environmental Protection Agency. Available online at: [https://www.cadc.uscourts.gov/internet/opinions.nsf/284E23FFE079CD5985257800050C9DA/\\$file/07-1053-1120274.pdf](https://www.cadc.uscourts.gov/internet/opinions.nsf/284E23FFE079CD5985257800050C9DA/$file/07-1053-1120274.pdf); last accessed: February 26, 2020.

Climate Change

Climate change is discussed in Section 3, California Environmental Quality Act Evaluation. Neither the U.S. EPA nor FHWA has issued explicit guidance or methods to conduct project-level GHG analysis. FHWA emphasizes concepts of resilience and sustainability in highway planning, project development, design, operations, and maintenance. Because there have been requirements set forth in California legislation and executive orders on climate change, the issue is addressed in the CEQA chapter of this document. The CEQA analysis may be used to inform the NEPA determination for the project. The four strategies set forth by FHWA to lessen climate change do correlate with efforts that the state has undertaken and is undertaking to deal with transportation and climate change. These strategies include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and reduction in the growth of vehicle miles travelled.

Cumulative Effects

The cumulative setting for air quality includes the SFBAAB and the jurisdictional boundaries of BAAQMD. Improved freeway operations and projected future development in the region would result in an increase in vehicle miles traveled within the SFBAAB and related increases in vehicle emissions. Therefore, air quality effects associated with transportation and other development projects in the SFBAAB would result in cumulative effects to air quality for permanent operational pollutant emissions.

As previously discussed, transportation plans that have been found to conform with the SIP are not considered to cause or contribute to violations of ambient air quality standards. Furthermore, a project included in a conforming plan would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard. Conforming transportation plans are subject to a threshold of no net increase in emissions. Because the project is included in Plan Bay Area and 2015 TIP, which conform to the SIP, the project would not result in a cumulatively considerable net increase of any criteria pollutant.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Caltrans' Special Provisions and Standard Specifications will include the requirement to minimize or eliminate dust during project construction through the application of dust palliatives (water, dust suppressant, or dust binder). Avoidance and minimization control measures will be implemented as specified in Standard Specifications Section 14-9.02 "Air Pollution Control", Section 18-1.03 "Dust Palliatives; Construction", and other sections related to dust control.

Measure AQ 1: The following dust control measures will also be considered during development of Plans, Specifications, and Estimates for the project construction contract:

- Water active construction areas as needed
- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet of freeboard
- Stabilize access areas (i.e. temporary access roads or entrances/exits) with rock material and maintain as needed
- Keep dust to a minimum during street sweeping activities. Use a vacuum whenever dust generation is excessive, or sediment pickup is ineffective
- Apply hydromulch, hydroseed or soil stabilizers to disturbed areas if inactive for at least 14 days or prior to a forecasted rain event
- Minimize stockpiles at jobsite. Cover active and inactive soil stockpiles and surround with a linear sediment barrier if inactive for at least 14 days or prior to a forecasted rain event. Water soil stockpiles as needed
- Limit traffic speeds on unpaved roads to 15 mph
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways
- Replant vegetation in disturbed areas as quickly as possible

In addition, pollutant emissions from construction equipment exhaust can be controlled by the following, in accordance with Caltrans Standard Specifications Section 7-1.02C “Emissions Reduction”:

- Keeping engines properly tuned
- Limiting idling

Caltrans is firmly committed to implementing statewide GHG reduction strategies from the Strategic Growth Plan to help meet statewide GHG reduction targets. The following measures shall be implemented to reduce long-term operational GHG emissions:

- Caltrans and the California Highway Patrol are working with regional agencies to implement intelligent transportation systems (ITS) to help manage the efficiency of the existing highway system. ITS is commonly referred to as electronics, communications, or information processing used singly or in combination to improve the efficiency or safety of a surface transportation system.
- The project will utilize energy efficient lighting, which will be defined during final design.

2.2.7 NOISE

This section evaluates noise and vibration associated with implementation of the project. Information in this section is primarily drawn from the *Noise Study Report (NSR)* prepared for the project.

REGULATORY SETTING

NEPA of 1969 and CEQA provide the broad basis for analyzing and abating highway traffic noise effects. The intent of these laws is to promote the general welfare and to foster a healthy environment. The requirements for noise analysis and consideration of noise abatement and/or mitigation, however, differ between NEPA and CEQA.

Federal

National Environmental Policy Act and 23 CFR 772

For highway transportation projects with FHWA involvement (and the Department, as assigned), the Federal-Aid Highway Act of 1970 and its implementing regulations (23 CFR 772) govern the analysis and abatement of traffic noise impacts. The regulations require that potential noise impacts in areas of frequent human use be identified during the planning and design of a highway project. The regulations include noise abatement criteria (NAC) that are used to determine when a noise impact would occur. The NAC differ depending on the type of land use under analysis. For example, the NAC for residences (67 dBA) is lower than the NAC for commercial areas (72 dBA). The following table, Table 2.2.7-1, lists the noise abatement criteria for use in the NEPA/23 CFR 772 analysis.

Table 2.2.7-1 Noise Abatement Criteria

Activity Category	NAC, Hourly A-Weighted Noise Level, dBA $L_{eq(h)}$	Description of Activities
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B ¹	67 Exterior	Residential.
C ¹	67 (Exterior)	Active sport areas, amphitheatres, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit

Activity Category	NAC, Hourly A-Weighted Noise Level, dBA $L_{eq(h)}$	Description of Activities
		institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52 (Interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios
E	72 (Exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A–D or F.
F	No NAC—reporting only	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical, etc.), and warehousing.
G	No NAC—reporting only	Undeveloped lands that are not permitted.

Source: Caltrans, 2011. Traffic Noise Analysis Protocol (TNAP) - For New Highway Construction, Reconstruction, and Retrofit Barrier Projects.

¹ Includes undeveloped lands permitted for this activity category.

NAC = noise abatement criteria; dBA = A-weighted decibel; $L_{eq(h)}$ = 1-hour A-weighted equivalent sound level

Figure 2.2-7 lists the noise levels of common activities to enable readers to compare the actual and predicted highway noise levels discussed in this section with common activities.

Figure 2.2-7 Noise Levels of Common Activities

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Jet Fly-over at 300m (1000 ft)	110	Rock Band
Gas Lawn Mower at 1 m (3 ft)	100	
Diesel Truck at 15 m (50 ft), at 80 km (50 mph)	90	Food Blender at 1 m (3 ft)
Noisy Urban Area, Daytime	80	Garbage Disposal at 1 m (3 ft)
Gas Lawn Mower, 30 m (100 ft) Commercial Area	70	Vacuum Cleaner at 3 m (10 ft)
Heavy Traffic at 90 m (300 ft)	60	Normal Speech at 1 m (3 ft)
Quiet Urban Daytime	50	Large Business Office
Quiet Urban Nighttime	40	Dishwasher Next Room
Quiet Suburban Nighttime	30	Theater, Large Conference Room (Background)
Quiet Rural Nighttime	20	Library
	10	Bedroom at Night, Concert Hall (Background)
	0	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

Source: Caltrans, 2019

According to the Department’s Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects, August 2006, Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects, May 2011, a noise impact occurs when the predicted future noise level with the project substantially exceeds the existing noise level (defined as a 12 dBA or more increase) or when the future noise level with the project approaches or exceeds the NAC. Approaching the NAC is defined as coming within 1 dBA of the NAC.

If it is determined that the project will have noise impacts, then potential abatement measures must be considered. Noise abatement measures that are determined to be reasonable and feasible at the time of final design are incorporated into the project plans and specifications. This document discusses noise abatement measures that would likely be incorporated in the project.

The Department's Traffic Noise Analysis Protocol sets forth the criteria for determining when an abatement measure is reasonable and feasible. Feasibility of noise abatement is basically an engineering concern. A minimum 5 dBA reduction for all impacted in the future noise levels must be achieved for an abatement to be considered feasible. Other considerations include topography, access requirements, other noise sources, and safety considerations. Additionally, a noise reduction of at least 7 dBA must be achieved at one or more benefited receptors for an abatement measure to be considered reasonable. The reasonableness determination is basically a cost-benefit analysis. Factors used in determining whether a proposed noise abatement measure is reasonable include residents' acceptance and the cost per benefited residence.

State

California Environmental Quality Act

CEQA requires a strictly baseline versus build analysis to assess whether a proposed project will have a noise impact. If a proposed project is determined to have a significant noise impact under CEQA, then CEQA dictates that mitigation measures must be incorporated into the project unless those measures are not feasible. The rest of this section will focus on the NEPA/23 CFR 772 noise analysis; please see Chapter 3.0 of this document for further information on noise analysis under CEQA.

AFFECTED ENVIRONMENT

Information in this section is based on the NSR and the *Noise Abatement Decision Report* (NADR) prepared for the project. The noise study area includes residential, commercial, and industrial land uses within 1,000 feet of the project site.

Principles of Acoustics

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air) to a hearing organ, such as a human ear. Noise is defined as loud, unexpected, or annoying sound.

In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receptor, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receptor determine the sound level and characteristics of the noise perceived by the receptor. The field of acoustics deals primarily with the propagation and control of sound.

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low-frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or Hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz).

High frequencies are sometimes more conveniently expressed in kilohertz (kHz), or thousands of Hertz. The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.

Measuring Sound Pressure and Human Response

The amplitude of pressure waves generated by a sound source determines the loudness of that source. Though sound pressure amplitude is measured in micro-Pascals (μPa), the range of values in terms of μPa (100 to 100,000,000 μPa) is too wide to use analytically. Instead, a logarithmic scale is used to describe sound pressure level (SPL) in terms of decibels (dB). The threshold of hearing for young people is about 0 dB, which corresponds to 20 μPa . Changes in SPL are quantified using 3-dB increases³⁷ because decibels are logarithmic units and changes in said units can't be calculated using ordinary arithmetic. However, the subjective human perception of a doubling of loudness will usually be different than what is measured with precise instrumentation.

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear is able to discern 1 dB changes in sound levels, when exposed to steady, single-frequency ("pure-tone") signals in the midfrequency (1,000 Hz–8,000 Hz) range. In typical noisy environments, changes in noise of 1 to 2 dB are generally not perceptible. However, it is widely accepted that people are able to begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5-dB increase is generally perceived as a distinctly noticeable increase, and a 10-dB increase is generally perceived as a doubling of loudness. Therefore, a doubling of sound energy (e.g., doubling the volume of traffic on a highway) (which would result in a 3 dB increase in sound) would be perceived as barely detectable.

A-Weighted Decibels

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Although the intensity (energy per unit area) of the sound is a purely physical quantity, the loudness or human response is determined by the characteristics of the human ear.

³⁷ Under the decibel scale, a doubling of sound energy corresponds to a 3-dB increase. Two identical sources each producing sound of the same loudness would result in a 3 dB sound level increase at a given distance. For example, if one automobile produces an SPL of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB—rather, they would combine to produce 73 dB. Under the decibel scale, three sources of equal loudness together produce a sound level 5 dB louder than one source.

Human hearing is limited in the range of audible frequencies as well as in the way it perceives the SPL in that range. In general, people are most sensitive to the frequency range of 1,000–8,000 Hz and perceive sounds within that range better than sounds of the same amplitude in higher or lower frequencies. To approximate the response of the human ear, sound levels of individual frequency bands are weighted, depending on the human sensitivity to those frequencies. Then, an “A-weighted” sound level (expressed in units of dBA) can be computed based on this information. Figure 2.2-7 describes typical A-weighted noise levels for various noise sources.

Noise Descriptors

Noise in our daily environment fluctuates over time. Some fluctuations are minor, but some are substantial. Various noise descriptors have been developed to describe time-varying noise levels. The following are the noise descriptors most commonly used in traffic noise analysis:

- Equivalent Sound Level (L_{eq}): L_{eq} represents an average of the sound energy occurring over a specified period. The 1-hour A-weighted equivalent sound level ($L_{eq[h]}$) is the energy average of A-weighted sound levels occurring during a one-hour period and is the basis for NAC used by Caltrans and FHWA.
- Percentile-Exceeded Sound Level (L_{xx}): L_{xx} represents the sound level exceeded for a given percentage of a specified period (e.g., L10 is the sound level exceeded 10% of the time, and L90 is the sound level exceeded 90 percent of the time).
- Maximum Sound Level (L_{max}): L_{max} is the highest instantaneous sound level measured during a specified period.
- Day-Night Level (L_{dn}): L_{dn} is the energy average of A-weighted sound levels occurring over a 24-hour period, with a 10-dB penalty applied to A-weighted sound levels occurring during nighttime hours between 10:00 p.m. and 7:00 a.m.
- Community Noise Equivalent Level (CNEL): Similar to L_{dn} , CNEL is the energy average of the A-weighted sound levels occurring over a 24-hour period, with a 10 dB penalty applied to A-weighted sound levels occurring during the nighttime hours between 10:00 p.m. and 7:00 a.m., and a 5 dB penalty applied to the A-weighted sound levels occurring during evening hours between 7:00 p.m. and 10:00 p.m.

Existing Land Uses

A field investigation was conducted to identify land uses that could be subject to traffic and construction noise effects from the project. The following land uses were identified in the study area:

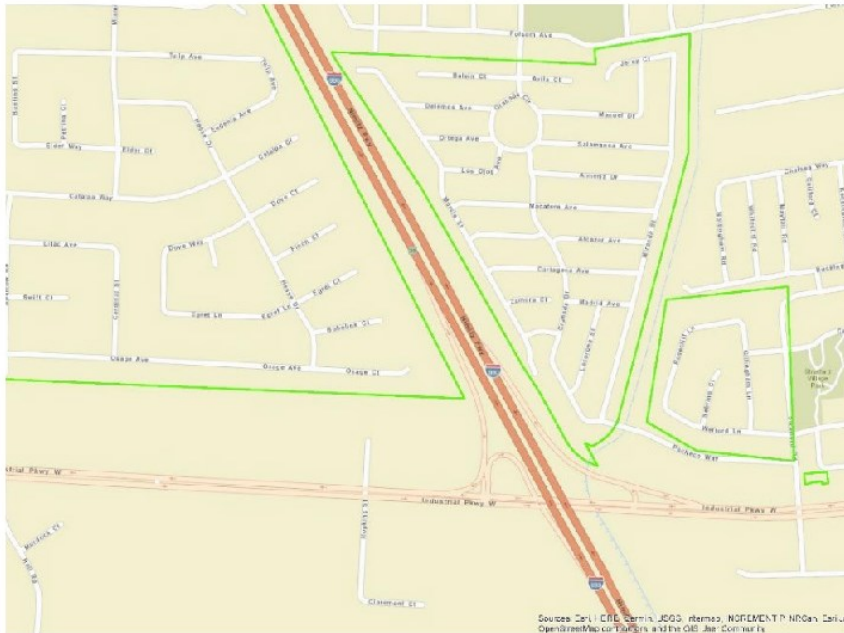
- Activity Category B: Single-family residences and multi-family residences
- Activity Category E: Commercial retail uses
- Activity Category F: Industrial uses

Within the noise study area, most of the receptors fall into Category B (residential). The location of individual sensitive receptors is mapped in the NSR. A maximum peak-hour noise level criteria of 67 dBA L_{eq} applies at the exterior use area of residences. Most of the other land use is industrial (Category F) and commercial. There are a few restaurants with exterior seating (Category E). Primary consideration for noise abatement is given to exterior areas where frequent human use occurs that would benefit from a lowered noise level. In general, an area of frequent human use is an area where people are exposed to traffic noise for an extended time on a regular basis. As no permitted developments have been identified within the study limits, future Category B and C land uses were not evaluated for noise impacts and abatement.

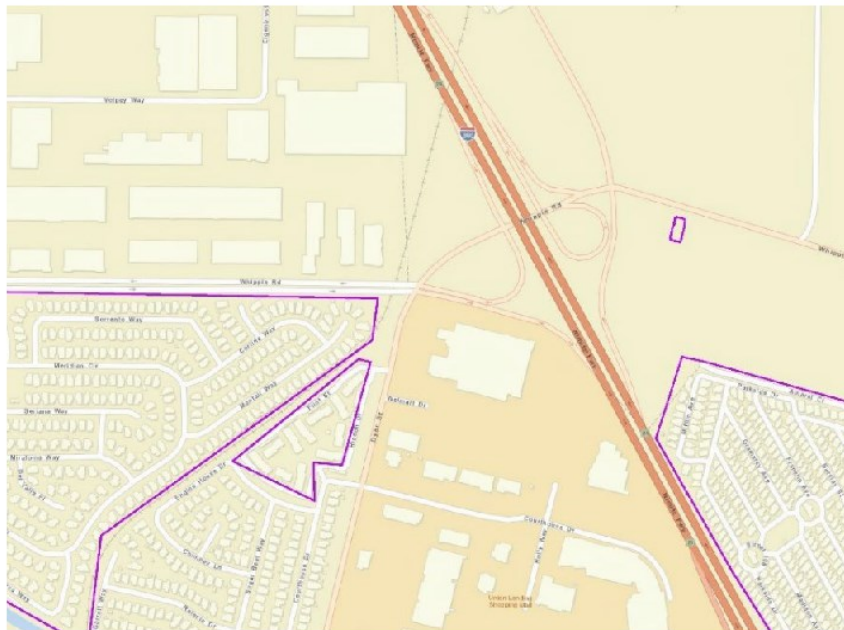
Although all developed land uses are evaluated in this section, noise abatement is only considered for areas of frequent human use that would benefit from a lowered noise level. Accordingly, this section focuses on locations with defined outdoor activity areas, such as residential backyards and common use areas at multi-family residences.

I-880 Interchange Improvements (Whipple Road-Industrial Parkway Southwest and Industrial Parkway West) Project

I-880/Industrial Parkway West



I-880/Whipple Road Industrial Parkway Southwest



Noise Analysis Sub Areas

Figure

2.2-8

Source: Circlepoint, 2019

I-880 Interchange Improvements (Whipple Road-Industrial Parkway Southwest and Industrial Parkway West) Project

I-880/Industrial Parkway West



I-880/Whipple Road Industrial Parkway Southwest



Legend

- Short-term measurement location
- Receptor location
- Long-term measurement location
- Proposed improvements

Noise Measurement and Receptor Locations

Figure

2.2-9

Source: ESRI, 2019

Existing Noise Environment

The existing noise environment varies by location, depending on site characteristics such as proximity to other roadways or noise sources, the relative elevation of roadways and receptors, and intervening structures or topography.

The noise study area was divided into two sub-areas, one centered around the I-880/Whipple Road-Industrial Parkway Southwest Interchange and the other around the I-880/Industrial Parkway West Interchange. The study areas are shown in Figure 2.2-8 and the noise measurement locations are shown in Figure 2.2-9. The existing noise environment at each sub area is characterized based on short- and long-term noise monitoring that was conducted. Noise measurement locations are mapped in the NSR, which also includes site photographs of noise measurement locations. Land uses between the two interchanges include industrial and commercial. No measurements or receptors were placed in this area.

There are existing noise barriers (sound walls) in the study area. Existing Barrier 1 and Barrier 2 are located to the west and east of I-880, respectively, near the I-880/Industrial Parkway West interchange. Existing Barrier 3 is located east of I-880, south of the I-880/Whipple Road-Industrial Parkway Southwest Interchange.

Short-term measurements were conducted at seven locations, at a nominal microphone height of 5 feet above the ground (ST-1 through ST-7) (Figure 2.2-9). Short-term (15-minute long) calibrated, digital recordings were made simultaneously with traffic counts on Thursday, October 4; Tuesday, November 13; and Tuesday, November 20, 2018. The results of the short-term noise surveys are summarized in Table 2.2.7-2, which shows the typical peak hour L_{eq} noise level at each of the seven short-term locations. The weekday noise level patterns tend to increase during morning commute hours, remain somewhat elevated throughout the day, taper off at night, and are lowest in the early morning hours.

Long-term measurements were conducted at one location from Tuesday, November 13, 2018 to Tuesday, November 20, 2018 (LT-1) (Figure 2.2-9). Long-term measurements were only recorded at the I-880/Whipple Road-Industrial Parkway Southwest Interchange.

I-880/Industrial Parkway West

The noise sensitive areas around the I-880/Industrial Parkway West Interchange are shown in green in Figure 2.2-8. South of the interchange, land uses are industrial and commercial. The Red Roof Inn on Industrial Parkway West does not have exterior frequent human use and is not considered a noise-sensitive land use. Starbucks on Stratford Road has outdoor seating area that was considered sensitive. North of the interchange, noise-

sensitive land uses consist of single-family residential homes; mid-density homes on the west side of I-880; and the Spanish Ranch Mobile Home Community and Stratford Village neighborhoods on the east side of I-880.

At ST-1 and ST-2, traffic noise from I-880 was 58-63 dBA L_{eq} due to existing noise walls. These measurements are representative of backyards on the east and west side of I-880.

ST-3 is representative of backyards in Stratford Village, where view of the roads is obstructed by an existing building. The measured noise level was 59 dBA.

I-880/Whipple Road-Industrial Parkway Southwest

Noise sensitive areas near the I-880/Whipple Road-Industrial Parkway Southwest Interchange are shown in purple in Figure 2.2-8. Land uses east of the interchange are mostly industrial and commercial. Motel 6 Hayward on Industrial Parkway Southwest, America's Best Value Inn on Whipple Road, and restaurants within the study area do not have exterior areas with frequent human use. The only nearby restaurant with outdoor seating near the project is a Starbucks on Whipple Road. Central Oak West Mobile Home Park is near the southeastern limits of the project. Land uses west of the interchange include industrial, commercial, and residential. Meridien Court single-family residences and two-story, multi-family residences on Risdon Drive are within the noise study area.

ST-4 was measured at a commercial business, with local traffic noise from Whipple Road dominating the environment with a 69 dBA L_{eq} level. Noise measurement locations ST-5 and ST-7 are representative of backyards in Meridien Court and Central Park West, respectively. Traffic noise from I-880 is attenuated in this area by existing noise walls.

ST-6 was not shielded from traffic on Whipple Road and Dyer Road, and an existing noise level measurement of 67 dBA was obtained. Noise measurements at location ST-6 were taken to approximate noise levels at the nearby apartment complex.

Long-term sound level data measured at location LT-1 was located near ST-6 and shows typical morning peak hour noise levels of 73 to 75 dBA and typical evening peak hour noise levels of 73 to 74 dBA. The hourly noise results are shown in the NSR.

Table 2.2.7-2 Short-term and Long-term Noise Measurements

Study Area Segment ¹	Location	Site Description ²	Land Use	Meas. Dates ³ and Start Time	Duration (minutes)	Meas. L_{eq} ⁴	Observed Vehicle Mix ⁵					
							Road	Autos	Med. Trucks	Heavy Trucks	Bus	Motorcycles
I-880/ Industrial Parkway West	ST-1	Sidewalk at 1740 Egret Ct	B	4-Oct	15	58	Industrial	469	88	20	1	2
				2:58 PM			I-880	2573	394	207	14	23
	ST-2	5 ft from fence at 28100 Murcia St	B	20-Nov	15	63.3	Industrial	541	77	33	1	2
				4:02 PM			I-880	2515	425	99	10	8
	ST-3	Sidewalk about 500 ft from fence on Pacheco Way	B	20-Nov	15	58.9	Industrial	488	63	48	1	1
				4:31 PM			I-880	2487	268	75	13	17
I-880/ Whipple Road- Industrial Parkway Southwest	ST-4	Starbucks at 2472 Whipple Rd.	E	13-Nov	15	69.4	Whipple	827	65	19	4	2
				5:02 PM			I-880	1804	207	64	3	5
	ST-5	Meridien Ct on sidewalk near 2806 Montair PI	B	13-Nov	15	58.8	Whipple	726	67	21	3	3
				3:59 PM			I-880	2224	262	84	11	5
	ST-6	Whipple/Dyer Cross Street on sidewalk near 30600 Dyer St.	B	13-Nov	15	66.7	Whipple	637	59	23	9	1
				3:18 PM			I-880	2195	307	103	8	7
	ST-7	Central Park West on Sidewalk near 2559 Mifflin Ave	B	13-Nov	15	62.9	Whipple	689	79	29	6	3
				4:32 PM			I-880	2249	221	67	7	17
	LT-1	Whipple/Dyer Intersection	B	11/13-11/20	7 days	Peak Hour Levels: 73 - 75 dBA						

¹Sub-area segments are shown in Figure 2.2-7.

²Short-term sound level meter on tripod set to 5 feet. Long-term monitor attached to pole at 10 feet in height. Photos provided in the NSR.

³In some cases, two measurements were conducted on different days with different sound level results and different traffic mixes; the results providing the best fit to the traffic model are listed here, and, where applicable, the other measurement date and sound level result are listed in the NSR.

⁴Fifteen-minute measured L_{eq} sound level

⁵The specific directional volumes extrapolated to a full hour are listed in the NSR.

L_{eq} = Equivalent Sound Level; dBA = A-weighted decibel

ENVIRONMENTAL CONSEQUENCES

This section discusses the predicted traffic noise level under existing and design-year conditions (with and without the project), identifies traffic noise impacts, and considers noise abatement. The CFR (23 CFR 772) “Procedures for Abatement of Highway Traffic Noise” provides procedures for preparing operational and construction noise studies and evaluating noise abatement options. Under 23 CFR 772, projects are categorized as Type I or Type II projects.

FHWA defines a Type I project as a proposed federal or federal-aid highway project for the construction of a highway on a new location, the physical alteration of an existing highway where there is either a substantial horizontal or substantial vertical alteration, or other specifically listed activities in 23 CFR 772.7. Type I projects include the addition of an interchange, ramp, auxiliary lane, or truck-climbing lane to an existing highway, or the widening of an existing ramp by a full lane for its entire length. As the project would modify the existing I-880/Industrial Parkway West and I-880/Whipple Road-Industrial Parkway Southwest interchanges it is considered a Type I project. The FHWA noise regulations require noise analysis for all Type I projects.

Predicted design-year traffic noise levels with the project (Build Alternatives) are compared to modeled existing conditions and to design-year no-project conditions (No-Build Alternative). In this and the following sections “existing conditions” refers to modeled results. The comparison to existing conditions is included in the analysis to identify traffic noise impacts as defined under 23 CFR 772. The comparison to no-project conditions indicates the direct effect of the project.

Noise projections have been made for the outdoor areas of homes closest to the project. The results of the projections are provided below in Table 2.2.7-7. A “receiver” is a modeled location that can represent one or more dwelling units; a “receptor” corresponds to one specific dwelling unit. The number of receptors that correspond to each modeled receiver is also provided.

Construction

Construction Phases

Construction phases would include stream diversion; concrete pavement construction, excavation, and grading; construction of bridge structures, culverts and drainage systems, retaining walls, guardrail and concrete barriers; miscellaneous concrete work; relocation of utilities; paving; and installation of overhead signs and lighting.

Construction noise would primarily result from the operation of heavy construction equipment and arrival and departure of heavy-duty trucks. The highest maximum instantaneous noise levels would result from paving and demolition activities. Cast-in-drilled-hole piles are expected to be used for structures immediately adjacent to Ward Creek and Whipple undercrossing structures. Overhead signs would be supported on cast-in-drilled-hole piles in the median of I-880. Some areas of the project site would require only re-striping, and some areas would include new concrete median barriers. Construction noise for all receptors would be short-term and intermittent.

Equipment Noise

Table 2.2.7-3 summarizes typical noise levels produced by construction equipment commonly used on roadway construction projects. Construction equipment is expected to generate noise levels ranging from 70 to 90 dBA at 50 feet, and noise produced by construction equipment would be reduced over distance at a rate of about 6 dBA per doubling of distance, as outlined in FHWA's 2006 *Roadway Construction Noise Model User's Guide* and Caltrans' 2013 *Technical Supplement to the Caltrans Traffic Noise Analysis Protocol*.

Table 2.2.7-3 Construction Equipment Noise

Equipment	Maximum Noise Level (dBA at 50 feet)
Scrapers, bulldozer, graders, cranes	85
Excavators	85
Heavy Trucks, tractors	84
Compactors, wheeled loader	80
Scarifier	85
Pneumatic Tools	85
Concrete Pumps	82
Pavers	85
Hoe Ram	90
Street Sweeper	80
Auger Drill Rig (CIPH)	85

Source: Wilson Ihrig, 2019
dBA = A-weighted decibel

Daytime Construction

Predicted roadway construction noise levels are listed in Table 2.2.7-4 and are based on typical equipment and activity levels for roadway construction projects. See the NSR for the list of equipment used for each activity and reference noise levels and activity usage factors from the FHWA Roadway Construction Noise Model (FHWA 2006) and Caltrans Technical Noise Supplement (TeNS 2013). To obtain the values shown in Table 2.2.7-5, the reference noise levels were adjusted to a 100-foot distance assuming basic geometric spreading for a point source (e.g., 6 dBA per doubling distance). The hourly average noise level was estimated by summing together the three loudest pieces of equipment.

Table 2.2.7-6 provides the estimated daytime construction sound levels at the nearest receptors. The receptor locations are shown in Figure 2.2-9. Many of the activities associated with daytime construction would exceed existing noise levels at the I-880/Whipple Road-Industrial Parkway Southwest and I-880/Industrial Parkway West interchanges. Therefore, Caltrans BMPs would be applied during construction, and are detailed under Avoidance, Minimization, and/or Mitigation Measures.

Table 2.2.7-4 Typical Construction Noise at 100 Feet Distance by Phase

Construction Phase	Maximum Noise Level (L_{max} , dBA)	Hourly Average Noise Level ($L_{eq[h]}$, dBA)
Grubbing/Land Clearing	79	78
Grading/Excavation	79	80
Drainage/Utilities/Subgrade	79	79
Paving	84	81
Restriping/scarifying	79	72
Concrete barrier	76	69
Demolition	84	82
Structures (no piles)	79	75
Structures (with cast-in-drilled-hole piles)	79	77

Source: Wilson Ihrig, 2019

L_{max} = Maximum Sound Level; dBA = A-weighted decibel; $L_{eq(h)}$ = 1-hour A-weighted equivalent sound level

Table 2.2.7-5 Estimated Daytime Construction Noise Levels at Closest Receptors

Receptor	Location	Existing Typical Hourly L_{eq} ¹	Construction Noise Source	Distance to construction (highway)	Construction Sound Level (9 AM-6 PM) $L_{eq(h)}$	Construction Sound Level L_{max} at 50 feet
R-2	Osage Avenue	58 (ST-1)	Paving/Widening	100 ft (I-880)	81	90
			Demolition	600 ft (Bridge No. 33-0398)	70	90
			Structures (no piles)	750 ft (I-880 SB on-ramp)	58	85
			Grading/Excavation	100 ft (I-880)	80	85
R-8	Pacheco Way	58.9 (ST-3)	Paving/Widening	150 ft (I-880 NB on-ramp)	78	90
			Demolition	150 ft (I-880 NB on-ramp)	83	90
			Structures (CIPH)	150 ft (I-880 NB on-ramp)	73	85
			Grading/Excavation	100 ft (I-880 NB on-ramp)	85	85
R-11	Montair Place	58.8 (ST-5)	Paving/Widening	50 ft (Whipple Rd)	87	90
			Restriping	50 ft (Whipple Rd)	78	85
			Grading/Excavation	400 ft (Whipple Rd)	68	85
R-14	Starbucks	69.4 (ST-4)	Paving/Widening	50 ft (Whipple Rd)	87	90
			Structures (CIPH)	700 ft (I-880 overpass)	60	85

Receptor	Location	Existing Typical Hourly L_{eq} ¹	Construction Noise Source	Distance to construction (highway)	Construction Sound Level (9 AM-6 PM) $L_{eq(h)}$	Construction Sound Level L_{max} at 50 feet
			Grading/Excavation	250 ft (Whipple Rd)	77	85
R-15	Mifflin Avenue	62.9 (ST-7)	Paving/Widening	25 ft ² (I-880)	94	90
			Restriping	25 ft ² (I-880)	84	85
			Grading/Excavation	1,000 ft (I-880 NB on-ramp)	65	85

Source: Wilson Ihrig, 2019

¹ Measured peak hour values during traffic counts reported previously in Table 2.2.7-2.

² R-15 located behind 16-foot highway barrier

L_{eq} = Equivalent Sound Level; $L_{eq(h)}$ = 1-hour A-weighted equivalent sound level; L_{max} = Maximum Sound Level; dBA = A-weighted decibel

Nighttime Construction

Construction of the bridge structure and associated ramps could require nighttime installation of cast-in-drilled-hole piles (CIDH). Auger drilling can generate maximum noise levels of 85 dBA and an hourly L_{eq} of 78 dBA at 50 feet. Noise levels produced by CIDH pile installation would be reduced with distance to an ambient level of 58 dBA at 500 feet. This would exceed the existing noise levels at the I-880/Whipple Road-Industrial Parkway Southwest and I-880/Industrial Parkway West interchanges. Therefore, Caltrans BMPs would be applied during construction, and are detailed under Avoidance, Minimization, and/or Mitigation Measures.

Operation

Build Alternatives: I-880/Industrial Parkway West – Tight Diamond Configuration

Modeling of the future condition with the Build Alternatives (2045 with project) predicts increases in noise levels in a range of 0 to 1 dBA over the existing condition. Table 2.2.7-6 provides a detailed overview of projected noise increases under each Build Alternative. As shown in that table, each Build Alternative would have the same or similar effect on operational noise levels. Predicted noise levels at 30 residential receptors would approach or exceed the NAC of 67 dBA in 2045 with implementation of the Build Alternatives. A noise impact would occur at these receiver locations; therefore, noise abatement is considered under Preliminary Noise Abatement Measures below.

Build Alternatives: I-880/Whipple Road-Industrial Parkway Southwest

Modeling of the future condition with the Build Alternatives (2045 with project) predicts increases in noise levels in a range of 0 to 2 dBA over the existing condition. Predicted noise levels at 26 residential receptors would approach or exceed the NAC of 67 dBA in 2045 with implementation of the Build Alternatives. The Starbucks approaches NAC of 72 dBA. A noise impact would occur at these receiver locations; therefore, noise abatement is considered under Preliminary Noise Abatement Measures below.

No Build Alternative

The No-Build Alternative (2045 no project) assumes the current road geometry would remain unchanged. In 2045, increases in traffic are expected to increase overall noise levels for the No-Build Alternative by 1 to 2 dBA over existing conditions. The predicted noise levels for the No-Build Alternative are shown in Table 2.2.7-6.

Table 2.2.7-6 Modeled Results for 2045 Design Year – Comparison of Existing to Year 2045

Study Area		Receiver ID (Number of Represented Receptors)/ Location	Residential/ Commercial Criteria	Worst Hourly Noise Level (L_{eq} dBA)			Noise Level Increases (dBA)	
				2018 (Existing)	2045 No Build	2045 Build	Plus Project over Existing	Plus Project over No Build
Alt. 1 I-880/ Industrial Parkway West Tight Diamond	R-1 (5)	1705 Tulip Ave	67	66	66	66	0	0
	R-2 (23)	1741 Egret Ct	67	62	62	62	0	0
	ST-1 (N/A)	ST-1/Egret Ct.	N/A	61	61	61	0	0
	R-3 (1)	28100 Murcia St	67	66	66	66	0	0
	ST-2 (N/A)	ST-2/Murcia St.	N/A	66	66	66	0	0
	R-4 (6)	28171 Murcia St	67	66	66	66	0	0
	R-5 (4)	28219 Murcia St	67	65	65	65	0	0
	R-6 (15)	28395 Murcia St	67	66	67	67	1	0
	R-7 (8)	28879 Grenada Dr	67	65	66	65	0	-1
	R-8 (3)	28911 Grenada Dr	67	68	68	66	-2	-2
	R-9 (15)	1838 Welford Ln	67	59	60	60	1	0
	ST-3 (N/A)	ST-3/Pacheco Way	N/A	59	60	60	1	0
	R-10 (1)	Starbucks	72	67	69	69	2	0

CHAPTER 2.2 AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES,
AND AVOIDANCE MINIMIZATION AND/OR MITIGATION MEASURES

Study Area	Receiver ID (Number of Represented Receptors)/ Location	Residential/ Commercial Criteria	Worst Hourly Noise Level (L _{eq} dBA)			Noise Level Increases (dBA)		
			2018 (Existing)	2045 No Build	2045 Build	Plus Project over Existing	Plus Project over No Build	
Alt. 2 I-880/ Industrial Parkway West Hybrid Partial Cloverleaf/ Tight Diamond	R-1 (5)	1705 Tulip Ave	67	66	66	66	0	0
	R-2 (23)	1741 Egret Ct	67	62	62	62	0	0
	ST-1 (N/A)	ST-1/Egret Ct.	N/A	61	61	61	0	0
	R-3 (1)	28100 Murcia St	67	66	66	66	0	0
	ST-2 (N/A)	ST-2/Murcia St.	N/A	66	66	66	0	0
	R-4 (6)	28171 Murcia St	67	66	66	66	0	0
	R-5 (4)	28219 Murcia St	67	65	65	65	0	0
	R-6 (15)	28395 Murcia St	67	66	67	67	1	0
	R-7 (8)	28879 Grenada Dr	67	65	66	65	0	-1
	R-8 (3)	28911 Grenada Dr	67	68	68	67	0	-1
	R-9 (15)	1838 Welford Ln	67	59	60	60	1	0
	ST-3 (N/A)	ST-3/Pacheco Way	N/A	59	60	60	1	0
R-10 (1)	Starbucks	72	67	69	69	2	0	

CHAPTER 2.2 AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES,
AND AVOIDANCE MINIMIZATION AND/OR MITIGATION MEASURES

Study Area	Receiver ID (Number of Represented Receptors)/ Location	Residential/ Commercial Criteria	Worst Hourly Noise Level (L _{eq} dBA)			Noise Level Increases (dBA)		
			2018 (Existing)	2045 No Build	2045 Build	Plus Project over Existing	Plus Project over No Build	
Alt. 3 I-880/ Industrial Parkway West Hybrid Partial Cloverleaf/ Tight Diamond	R-1 (5)	1705 Tulip Ave	67	66	66	66	0	0
	R-2 (23)	1741 Egret Ct	67	62	62	62	0	0
	ST-1 (N/A)	ST-1/Egret Ct.	N/A	61	61	61	0	0
	R-3 (1)	28100 Murcia St	67	66	66	66	0	0
	ST-2 (N/A)	ST-2/Murcia St.	N/A	66	66	66	0	0
	R-4 (6)	28171 Murcia St	67	66	66	66	0	0
	R-5 (4)	28219 Murcia St	67	65	65	65	0	0
	R-6 (15)	28395 Murcia St	67	66	67	67	1	0
	R-7 (8)	28879 Grenada Dr	67	65	66	65	0	-1
	R-8 (3)	28911 Grenada Dr	67	68	68	67	0	-1
	R-9 (15)	1838 Welford Ln	67	59	60	60	1	0
	ST-3 (N/A)	ST-3/Pacheco Way	N/A	59	60	60	1	0
R-10 (1)	Starbucks	72	67	69	69	2	0	

CHAPTER 2.2 AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES,
AND AVOIDANCE MINIMIZATION AND/OR MITIGATION MEASURES

Study Area	Receiver ID (Number of Represented Receptors)/ Location	Residential/ Commercial Criteria	Worst Hourly Noise Level (L _{eq} dBA)			Noise Level Increases (dBA)		
			2018 (Existing)	2045 No Build	2045 Build	Plus Project over Existing	Plus Project over No Build	
I-880/ Whipple Road-Industrial Parkway Southwest	R-11 (27)	2802 Montair Pl	67	61	62	62	1	0
	ST-5 (N/A)	ST-5/Meriden Ct.	N/A	58	59	59	1	0
	R-12 (4)	2902 Flint St	67	65	66	66	1	0
	ST-6 (N/A)	ST-6/Whipple @ Dyer	N/A	68	69	69	1	0
	R-13 (1)	Common Pool Area	67	57	58	58	1	0
	R-14 (1)	ST-4/Starbucks	72	69	71	71	2	0
	R-15 (2)	2558 Mifflin Ave	67	63	64	64	1	0
	R-16 (4)	2554 Mifflin Ave	67	65	66	66	1	0
	R-17 (18)	2560 Mifflin Ave	67	65	66	66	1	0
	ST-7 (N/A)	ST-7/Mifflin	N/A	64	66	66	2	0

Source: Wilson Ihrig, 2019

The results are shown in whole integers, which sometimes results in discrepancies due to rounding.

L_{eq} = Equivalent Sound Level; dBA = A-weighted decibel; N/A = Not Applicable

Cumulative Effects

The cumulative setting for noise is equivalent to the noise study area evaluated above. Noise-sensitive land uses in the study area include single- and multi-family residences and two restaurants with exterior seating. Most of the areas adjacent to the study area are built-out, and there are no projects planned and programmed in the immediate vicinity of the project site.

The NSR utilized traffic volumes based on the CTC Travel Demand Model (as modified to ensure that the model accurately reflected planned and funded land-use development and transportation projects expected to be in place by 2025 and 2045). As such, the NSR analyzed cumulative conditions within the study area.

As shown in Table 2.2.7-6, a 1 to 2 dBA increase over existing conditions is anticipated under the Build Alternatives. A change of 2 dBA or less is not generally considered a perceptible or audible change in noise. Further, as described below, existing noise barriers are adequate to reduce operational noise levels below the NAC of 67 dBA. Therefore, the Build Alternatives would not result in an adverse effect related to noise, thus there would be no considerable contribution to a cumulative impact.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Caltrans's Best Practices for Noise Control

NOISE-1: Standard Caltrans noise control measures are used for all projects and require that construction noise shall not exceed a maximum sound level of 86 dBA at 50 feet between the hours of 9:00 p.m. and 6:00 a.m. The following standard measures will also be implemented to minimize or reduce the potential for noise impacts from project construction:

- Limit paving and demolition activities to between 7:00 a.m. and 7:00 p.m., where feasible.
- Equip all internal combustion engine driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment.
- Prohibit unnecessary idling (i.e., greater than 5 minutes in duration) of internal combustion engines within 100 feet of residences.
- Avoid staging of construction equipment within 200 feet of residences and locate all stationary noise-generating construction equipment, such as air compressors, portable power generators, or self-powered lighting systems as far as practicable from noise-sensitive receptors.
- Utilize "quiet" air compressors and other "quiet" equipment where such technology exists.

Noise Abatement Measures

A NADR was prepared in March 2020 using *Caltrans Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects, May 2011* guidance. The NADR discusses noise abatement measures that would likely be incorporated into the project and proposes additional noise control measures. The following noise control measures were proposed in the NADR:

- Use concrete safety barriers instead of steel safety railings that are acoustically transparent. A 4-foot safety barrier will reduce most acoustic energy.
- Deck texture to include longitudinal tining (concrete grooves) instead of transverse tining.
- If approved by the office of structure design, plate bridge joints shall be used instead of accordion joints.

Noise abatement measures for the Build Alternatives were evaluated for feasibility and reasonableness using Caltrans 2011 TNAP guidelines. There are no abatement criteria for undeveloped land uses. Thus, no abatement is considered for these areas.

Noise abatement is considered where noise impacts are predicted in areas of frequent human use that would benefit from a lowered noise level. According to 23 CFR 772(13)(c) and 772(15)(c), federal funding may be used for the following abatement measures:

- Construction of noise barriers, including acquisition of property rights, either within or outside the highway right-of-way.
- Traffic management measures including, but not limited to, traffic control devices and signing for prohibition of certain vehicle types, time-use restrictions for certain vehicle types, modified speed limits, and exclusive lane designations.
- Alteration of horizontal and vertical alignments.
- Acquisition of real property or interests therein (predominantly unimproved property) to serve as a buffer zone to preempt development which would be adversely impacted by traffic noise.
- Noise insulation of Activity Category D land use facilities listed in Table 2.2.7-1. Post-installation maintenance and operational costs for noise insulation are not eligible for Federal-aid funding.

Noise Barrier Noise Abatement

The three existing noise barriers (sound walls) and one new noise barrier were evaluated to determine whether they would provide adequate sound attenuation and would therefore be considered “feasible”. For noise abatement to be considered acoustically feasible, it must be predicted to provide at least a 5-dBA noise reduction at an impacted receptor for the design year condition.

In addition to an evaluation of feasibility, a determination of reasonableness must be made for proposed noise abatement including noise barriers. Reasonableness considers three allowance factors:

- The acoustical design goal (at least 7 dBA of noise reduction at one or more benefited receptors).
- The cost of noise abatement (determined per the guidelines set forth in the TNAP, Section 3).
- The viewpoints of benefited receptors (including property owners and residents of the benefited receptors).

Preliminary reasonableness can be determined by comparing the estimated construction costs with the calculated reasonable allowance factors described above. However, the final reasonableness decision regarding the construction of the sound barrier must be made upon completion of the project design and the public involvement process. Should project conditions change substantially prior to final design, the barrier analysis would be subject to re-evaluation.

Barrier Analysis

As shown in Table 2.2.7-6, projected highway noise levels for the 2045 design year are expected to approach or exceed the NAC at ten receivers within the study area, including one commercial receiver and nine residential receivers. Each modeled receiver represents one or more individual noise sensitive receptors.

One receiver location (R-14) corresponds to commercial facilities on Whipple Road. Projected traffic noise levels are expected to approach the NAC at this receiver with or without the project. Effective sound walls require contiguous barriers, and it is not possible to provide effective noise reduction where there are many driveways or other breaks in the sound wall. For this reason, no sound barrier analysis was conducted for R-14.

The three existing noise barriers range in height between 12 and 16 feet and are within the state right-of-way. An analysis was conducted to determine if the existing barriers are adequate to reduce sound levels below the NAC with implementation of the Build Alternatives. One new barrier was also evaluated. Table 2.2.7-7 summarizes the barriers considered and conclusions for each barrier. The NSR presents the full results of the barrier analysis.

The existing barriers would control noise under each Build Alternative to 66 dBA, which is below the NAC. Modeling of the existing barriers indicates they would provide adequate noise reduction for the design year, meaning that they would provide a minimum 5-dBA noise reduction for at least one impacted receptor. Based on the studies completed to date, the existing barriers offer feasible noise reduction. The existing noise barriers already provide a minimum 7-dBA noise reduction for at least one benefited receptor, indicating the existing barriers provide reasonable noise reduction. Therefore, as shown in Table 2.2.7-7, and documented in the NADR, no modifications to existing noise barriers or construction of new noise barriers were recommended for the project. These measures may change based on input received from the public. If during final design conditions have substantially changed, noise abatement may not be necessary. The final decision on noise abatement will be made upon completion of the project design.

Table 2.2.7-7 Summary of Existing and Potential New Noise Barriers

Barrier	Corresponding Noise Receptors	Existing/New	Recommendation
Barrier 1: Industrial West	R-1	Existing	No change recommended. The existing barrier would control projected noise under each Build Alternative to 66 dBA, which is below the NAC. Modeling of the barrier indicates it would provide noise reduction which is feasible for the design year, meaning that it would provide a minimum 5-dBA noise reduction, and reasonable, meaning that it already provides a minimum 7-dBA noise reduction for at least one receptor. Therefore, modification of this existing barrier is not necessary or recommended.
Barrier 2: Industrial East	R-3, R-4, R-6 and R-8	Existing	No change recommended. The existing barrier would control projected noise under each Build Alternative to 66 dBA, which is below the NAC. Modeling of the barrier indicates it would provide noise

CHAPTER 2.2 AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES,
AND AVOIDANCE MINIMIZATION AND/OR MITIGATION MEASURES

Barrier	Corresponding Noise Receptors	Existing/New	Recommendation
			reduction which is feasible for the design year, meaning that it would provide a minimum 5-dBA noise reduction, and reasonable, meaning that it already provides a minimum 7-dBA noise reduction for at least one receptor. Therefore, modification of this existing barrier is not necessary or recommended.
Barrier 3: Whipple/Dyer	R-12	Potential New Barrier	Not recommended. Barrier 3 was considered along the property line of the apartment complex on the west side of Dyer Street. A 16-foot-tall barrier would only result in a 3-dBA noise reduction, which does not meet the 5-dBA noise reduction feasibility threshold. Therefore, no barrier is proposed.
Barrier 4: Whipple East	R-16 and R-17	Existing	No change recommended. The existing barrier would control projected noise under each Build Alternative to 66 dBA, which is below the NAC. Modeling of the barrier indicates it would provide noise reduction which is feasible for the design year, meaning that it would provide a minimum 5-dBA noise reduction, and reasonable, meaning that it already provides a minimum 7-dBA noise reduction for at least one receptor. Therefore, modification of this existing barrier is not necessary or recommended.

Source: Wilson Ihrig, 2019
dBA = A-weighted decibel

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2.3 BIOLOGICAL ENVIRONMENT

This section evaluates potential impacts to biological and aquatic resources that would occur as a result of the project. Unless otherwise noted, information in this section is based on the NES prepared for the project.

2.3.1 NATURAL COMMUNITIES

This section of the document discusses natural communities of concern. The focus of this section is on biological communities, not individual plant or animal species. This section also includes information on wildlife corridors and habitat fragmentation. Wildlife corridors are areas of habitat used by wildlife for seasonal or daily migration. Habitat fragmentation involves the potential for dividing sensitive habitat and thereby lessening its biological value.

Habitat areas that have been designated as critical habitat under the Federal Endangered Species Act (FESA) are discussed below in Section 2.3.5, Threatened and Endangered Species. Wetlands and other waters are also discussed below in Section 2.3.2, Wetlands and Other Waters.

REGULATORY SETTING

No federal or state regulations would apply to the natural communities discussed in this section.

AFFECTED ENVIRONMENT

The biological study area (BSA) includes all areas that could potentially be impacted, temporarily or permanently, by the project within the maximum footprint of all build alternatives at both interchanges. The focus of this section is on biological communities, not individual plant or animal species. This section also includes information on wildlife corridors and habitat fragmentation. Wildlife corridors are areas of habitat used by wildlife for seasonal or daily migration. Habitat fragmentation involves the potential for dividing sensitive habitat and thereby lessening its biological value.

The BSA is in a highly developed urban area featuring parking lots, landscaped vegetation, and residential, commercial and industrial buildings. Water features within the BSA include Ward Creek, a man-made creek, and its associated drainage ditches and stormwater basins. Other water features within the BSA include Ward Creek's unnamed tributary and the Zone 3A Line D Channel maintained by the ACFCD. The Zone 3A, Line D Channel flows into Ward Creek, which drains outside of the BSA and then flows into Alameda Creek immediately east of Hesperian Boulevard. Within the BSA, Ward Creek is located within a concrete

channel. As discussed in Section 2.2.1, Hydrology and Floodplain, Ward Creek features an in-stream concrete outfall structure associated with an ACFCO pump station. Natural communities within the BSA have been altered and continue to be subject to disturbance from human activities.

Habitat areas that have been designated as critical habitat under FESA are discussed below in Section 2.3.5, Threatened and Endangered Species. Threatened and endangered species or habitat of such species is not likely to occur within the BSA. Wetlands and other waters are also discussed below in Section 2.3.2, Wetlands and Other Waters.

Habitat Types

Table 2.3.1-1 lists the non-aquatic habitat types present within the BSA. Biologists surveyed an 85.01-acre area encompassing the non-aquatic portions of the BSA and determined that ruderal, landscaped, California annual grassland, developed, bare ground, and arroyo willow stand habitats are located within the BSA. The remaining areas within the BSA consist of open water and freshwater marshes, which are discussed in Section 2.3.2, Wetlands and Other Waters. A description of each habitat type as it exists within the BSA is provided below. None of the non-aquatic habitat types within the BSA are sensitive natural communities.

Table 2.3.1-1 Natural Communities within the BSA

Natural Community	Total Acreage
Ruderal	8.31
Landscaped	12.60
California Annual Grassland	0.45
Developed	63.04
Bare Ground	0.51
Arroyo Willow Stand	0.10
<i>Total</i>	85.01

Source: Horizon Water & Environment, 2019

Ruderal

Ruderal vegetation is characterized by non-native forbs including bristly ox-tongue (*Helminthotheca echioides*), black mustard (*Brassica nigra*), Italian thistle (*Carduus pycnocephalus*), poison hemlock (*Conium maculatum*), fennel (*Foeniculum vulgare*), and broad leaf filaree (*Eroidum botrys*). Ruderal vegetation typically occurs in previously disturbed areas along roadsides, edges of development, or areas with frequent to periodic

human disturbance. Ruderal vegetation also occurs adjacent to the stormwater basins, the unnamed tributary to Ward Creek, the Zone 3A Line D Channel, and Ward Creek. Ruderal vegetation in these areas includes patches of Harding grass (*Phalaris aquatica*) and Himalayan blackberry (*Rubus armeniacus*). Wildlife observed within this vegetation community includes western fence lizard (*Sceloporus occidentalis*), mourning dove (*Zenaida macroura*), Eurasian collared-dove (*Streptopelia decaocto*), black phoebe (*Sayornis nigricans*), dark-eyed junco (*Junco hyemalis*).

Landscaped

Landscaped vegetation is characterized primarily by ornamental planted vegetation. Landscaped areas in the BSA are located adjacent to unpaved portions of Interstate 880 (I-880) and associated interchanges (e.g., cloverleaf ramps), pedestrian walkways, residential neighborhoods, commercial areas, and along surface streets. Wildlife associated with landscaped areas is the same as the developed land cover describe below.

California Annual Grassland

An approximately 0.45-acre area of California annual grassland occurs within the BSA. Dominant species include slender oat (*Avena barbata*), wild oat (*Avena fatua*), ripgut brome (*Bromus diandrus*), soft chess brome (*Bromus hordeaceus*), and Italian ryegrass (*Festuca perennis*). California annual grassland often intersperses and interrupts larger areas of ruderal vegetation and, as such, typically occurs at similar locations within the BSA as ruderal cover. Wildlife observed in grassland areas was similar to ruderal vegetation described above.

Developed

Developed land cover in the BSA includes roads and manmade features such as stormwater drainage ditches, buildings, sound walls, and parking lots. Vegetation in these areas, if present at all, is usually sparse, dominated by weedy herbaceous species like ruderal vegetation. Developed land cover includes the I-880/Whipple Road-Industrial Parkway Southwest and I-880/Industrial Parkway West interchanges and associated roadways; Whipple Road; Industrial Parkway West; Industrial Parkway Southwest; Alvarado Niles Road; adjacent surface streets; and residential, commercial, and industrial buildings. Wildlife species typically associated with developed areas include striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), and Virginia opossum (*Didelphis virginiana*). Wildlife observed in developed cover included domestic cat (*Felis catus*), mourning dove, black phoebe, American crow (*Corvus brachyrhynchos*), turkey vulture (*Cathartes aura*), and European starling (*Sturnus vulgaris*). Three inactive mud cup nests were located under the I-880/Industrial Parkway West overcrossing immediately above Ward Creek. These

inactive nests may have been formerly used during the nesting season by cliff swallow (*Petrochelidon pyrrhonota*) or black phoebe (*Sayornis nigricans*).

Bare Ground

Bare ground consists of areas of bare soil that lacks vegetation due to lack of sunlight or recent disturbance. Bare ground occurs in the BSA adjacent to the I-880/Whipple Road-Industrial Parkway Southwest and I-880/Industrial Parkway West interchanges, under the I-880/Ward Creek Bridge, under the I-880/Industrial Parkway West overcrossing, and within the northeast I-880/ Whipple Road-Industrial Parkway Southwest Interchange cloverleaf that was recently disturbed during construction activities (these construction activities were not associated with this project).

Arroyo Willow Stand

This vegetation type is located on the north side of the northbound I-880/Alvarado Niles on-ramp, immediately north of the culvert. The arroyo willow stand spans a constructed stormwater channel and is surrounded by landscaped vegetation. Arroyo willow is the dominant species in this vegetation type with sparse non-native grasses and ruderal species in the understory. Wildlife associated with the Arroyo willow stand is the same as developed land cover described above.

Trees

There are 314 trees regulated by local ordinances within the BSA. Regulated trees meet specific size and species requirements and are protected by local ordinances, as described in Section 2.3.1, Regulatory Setting. These trees are primarily located along surface streets and landscaped areas and include native and non-native species. Eight regulated trees are within Union City's jurisdiction and 306 regulated trees are within Hayward's jurisdiction. Predominant tree species observed included coast redwood (*Sequoia sempervirens*), Peruvian pepper tree (*Schinus molle*), stonefruit (*Prunus sp.*), and blue gum eucalyptus (*Eucalyptus globulus*).

Wildlife Corridor/Fish Passage

The area within the BSA is highly urbanized with only small undeveloped areas. These areas are fragmented by manmade structures and development. The natural communities within the BSA are altered and subject to disturbance from human activities. As such there are no wildlife corridors within the BSA.

Tide gates downstream from the BSA block upstream movement of fish resulting in no fish passageways being present within the BSA.

ENVIRONMENTAL CONSEQUENCES

Land Cover

Build Alternatives

Table 2.3.1-2 provides a summary of the amount of temporary and permanent impact to non-aquatic vegetative communities within the BSA. Since none of the non-aquatic vegetative communities with the BSA are considered sensitive, none of the Build Alternatives would result in an adverse effect on non-aquatic sensitive communities.

Table 2.3.1-2 Impacts to Vegetative Communities within the BSA

Natural Community	Build Alternative 1		Build Alternative 2		Build Alternative 3	
	Permanent Impact (Acres)	Temporary Impact (Acres)	Permanent Impact (Acres)	Temporary Impact (Acres)	Permanent Impact (Acres)	Temporary Impact (Acres)
Ruderal	3.23-3.38	4.53-4.60	3.66-3.81	4.38-4.45	3.50-3.65	4.57-4.64
Landscaped	4.45-4.75	5.20-7.05	4.94-5.23	5.40-7.24	4.95-5.25	5.49-7.33
California Annual Grassland	0.15	0.21	0.19	0.24	0.17	0.28
Developed	22.35-26.10	34.41-36.30	22.50-26.25	35.62-33.73	21.87-25.62	35.00-36.89
Bare Ground	0.10	0.42	0.14	0.37	0.12	0.39
Arroyo Willow Stand	0.00	0.10	0.00	0.10	0.00	0.10
Total	30.28-34.48	46.72-46.83	31.43-35.62	46.06-46.18	30.61-34.81	45.83-49.63

Source: Horizon Water & Environment, 2019

No-Build Alternative

The No-Build Alternative assumes that the I-880/Whipple Road-Industrial Parkway Southwest and I-880/Industrial Parkway West interchanges would remain in their existing condition and no further action or improvements would occur. Under the No-Build Alternative, the existing roadways would remain unchanged except for planned and programmed improvements outside of the BSA. Therefore, the No-Build Alternative would not affect the vegetative communities within the BSA.

Trees

Construction and operation of the project would result in the removal of regulated trees. Caltrans and Alameda CTC are exempt from local tree protection ordinances. However, regulated trees provide aesthetic and other benefits to the community and could provide habitat and food sources for local wildlife; therefore, regulated trees impacted by the project will be replaced at ratios that are commensurate with the size of the tree to be removed.

Build Alternatives

The Build Alternatives would remove between 299 and 310 regulated trees – per local ordinances – within the BSA, depending on the Build Alternative selected (Table 2.3.1-3). Implementation of Measure BIO-1 would mitigate impacts by replacing all trees at a minimum 1:1 ratio, and a greater ratio for regulated and native trees.

Table 2.3.1-3 Regulated Tree Removal by Build Alternative

	Build Alternative 1	Build Alternative 2	Build Alternative 3
Regulated Tree Removal	299-306	300-307	303-310

Source: Horizon Water & Environment, 2019

No-Build Alternative

The No-Build Alternative assumes that the I-880/Whipple Road-Industrial Parkway Southwest and I-880/Industrial Parkway West interchanges would remain in their existing condition and no further action or improvements would occur. Under the No-Build Alternative, the existing roadways would remain unchanged except for planned and programmed improvements outside of the BSA. The No-Build Alternative would not result in removal of regulated trees within the BSA.

Cumulative Impacts

The cumulative impacts setting includes sensitive habitat types within and surrounding the BSA. Cumulative effects to natural communities would occur if planned and foreseeable development, when taken in combination with the project, would result in the removal of sensitive habitat types and could reduce sensitive habitat types on a regional level. The BSA is relatively developed and fragmented and experiences a high level of human disturbance. The BSA does not contain sensitive natural communities. As the project vicinity is urbanized, surrounding natural areas are likely to be in a similar condition. Development of

the project or other nearby areas would be unlikely to substantially affect valuable natural communities. Therefore, no cumulative effect related to natural communities is anticipated.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

No avoidance, minimization, and/or mitigation measures would necessary to address impacts relating to non-aquatic vegetative communities, because none of these are considered sensitive natural communities. Measure BIO-1 would be implemented to replace regulated trees within the BSA.

Measure BIO-1: The contractor will avoid the removal of trees regulated by local jurisdiction (i.e., Hayward and Union City) by minimizing the area of disturbance where practicable. The contractor will retain an arborist to direct tree pruning activities when feasible where removal is not necessary. Regulated trees to be removed or damaged during the project will be replaced within the BSA to the extent feasible through coordination with Hayward and Union City.

2.3.2 WETLANDS AND OTHER WATERS

REGULATORY SETTING

Federal

Wetlands and other waters are protected under a number of laws and regulations. At the federal level, the Water Pollution Control Act, more commonly referred to as the CWA (33 United States [U.S.] Code 1344), is the primary law regulating wetlands and surface waters. One purpose of the CWA is to regulate the discharge of dredged or fill material into Waters of the U.S., including wetlands. Waters of the U.S. include navigable waters, interstate waters, territorial seas, and other waters that may be used in interstate or foreign commerce. The lateral limits of jurisdiction over non-tidal water bodies extend to the OHWM, in the absence of adjacent wetlands. When adjacent wetlands are present, CWA jurisdiction extends beyond the OHWM to the limits of the adjacent wetlands. To classify wetlands for the purposes of the CWA, a three-parameter approach is used that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils formed during saturation and inundation). All three parameters must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the CWA.

Section 404 of the CWA establishes a regulatory program that provides that discharge of dredged or fill material cannot be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. The Section 404 permit program is run by the USACE with oversight by the U.S. EPA.

USACE issues two types of 404 permits: general and individual. There are two types of General permits: Regional and Nationwide. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to allow a variety of minor project activities with no more than minimal effects.

Ordinarily, projects that do not meet the criteria for a regional or nationwide permit may be permitted under one of USACE's individual permits. There are two types of individual permits: Standard permits and Letters of Permission. For individual permits, the USACE decision to approve is based on compliance with U.S. EPA's Section 404(b)(1) Guidelines (40 CFR 230), and whether permit approval is in the public interest. The Section 404 (b)(1) Guidelines (Guidelines) were developed by the U.S. EPA in conjunction with the USACE, and allow the discharge of dredged or fill material into the aquatic system (Waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The Guidelines state that USACE may not issue a permit if there is a "least environmentally

damaging practicable alternative” to the proposed discharge that would have lesser effects on Waters of the U.S., and not have any other significant adverse environmental consequences.

The EO for the Protection of Wetlands (EO 11990) also regulates the activities of federal agencies with regard to wetlands. Essentially, EO 11990 states that a federal agency, such as FHWA and/or Caltrans, as assigned, cannot undertake or provide assistance for new construction located in wetlands unless the head of the agency finds: (1) that there is no practicable alternative to the construction and (2) the project includes all practicable measures to minimize harm. A Wetlands Only Practicable Alternative Finding must be made.

State

At the state level, wetlands and waters are regulated primarily by the State Water Resources Control Board, the RWQCB and the CDFW. In certain circumstances, the Coastal Commission (or Bay Conservation and Development Commission) may also be involved. Sections 1600 through 1607 of the California Fish and Game Code (CFGC) require any agency that proposes a project that will substantially divert or obstruct the natural flow of or substantially change the bed or bank of a river, stream, or lake to notify CDFW before beginning construction. If CDFW determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement will be required. CDFW jurisdictional limits are usually defined by the tops of the stream or lake banks, or the outer edge of riparian vegetation, whichever is wider. Wetlands under jurisdiction of USACE may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the CDFW.

The RWQCBs were established under the Porter-Cologne Water Quality Control Act to oversee water quality. Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements and may be required even when the discharge is already permitted or exempt under the CWA. In compliance with Section 401 of the CWA, the RWQCBs also issue water quality certifications for activities which may result in a discharge to Waters of the U.S. This is most frequently required in tandem with a Section 404 permit request. Please see Section 2.2.2, Water Quality and Stormwater Runoff for more details.

AFFECTED ENVIRONMENT

The study area for wetlands and other waters includes water bodies within the BSA that could be affected by erosion or fill during project construction. The study area consists of a 4.53-acre area of wetlands and waters, 3.12 of which is Ward Creek and 1.33 acres is wetlands. These bodies of water occur in an area that extends from 0.6 mile south of the I-

880/Whipple Road-Industrial Parkway Southwest Interchange to 0.3 mile north of the I-880/Industrial Parkway West Interchange (Figure 2.3-1). The potential Waters of the U.S. present within the BSA provide essential ecosystem services that include habitat for plants and wildlife, water quality, and ecological functions.

An aquatic resources delineation report was prepared for the project site (included in the NES) that documents water features within the BSA that may be classified as Waters of the U.S. under USACE jurisdiction. These potentially jurisdictional waters total 3.12 acres and are treated as Waters of the U.S. for the purposes of analyzing project effects on aquatic resources. Storm water features that do not qualify as USACE jurisdictional may be regulated by CDFW and the RWQCB as waters of the State. A Jurisdictional Determination will be requested from USACE, in which USACE will make an official determination as to presence and geographical extent of jurisdictional waters within the BSA. All wetland and waters on the project site are anticipated to be under the RWQCB's jurisdiction due to their hydrologic connection to traditionally navigable waters (i.e., Alameda Creek and San Francisco Bay). The unnamed tributary to Ward Creek, Ward Creek, and the Zone 3A, Line D Channel are also expected to be subject to CDFW jurisdiction under Section 1600 (Lake and Streambed Alteration Agreement) of California Fish and Game Code and provide suitable habitat for aquatic and semi-aquatic wildlife species.

The project will implement stormwater BMPs consistent with Caltrans' Construction Site BMP Manual as required under the Construction General Permit. Compensatory mitigation would be provided for temporary impacts to Waters of the U.S. at a minimum 1:1 ratio and permanent impacts to Waters of the U.S. at a minimum 2:1 ratio, such that no net-loss of waters occurs. The final compensatory mitigation ratio will be determined through coordination with USACE.

No potentially federal jurisdictional wetlands were identified within the BSA, but potential non-wetland Waters of the U.S. were identified. Ward Creek, its unnamed tributary, and the Zone 3A Line D Channel were identified as potential jurisdictional Waters of the U.S.

The National Wetlands Inventory classifies Ward Creek, its unnamed tributary, and the Zone 3A Line D Channel as riverine (lower perennial) excavated features. Table 2.3.2-1 summarizes the potential jurisdictional waters within the BSA for all Build Alternatives.

In the northern portion of the study area, channelized perennial streams drain to Ward Creek, immediately east of I-880. Within the BSA, Ward Creek follows a mostly straight path that lacks meanders and riparian vegetation. The northern portion of the BSA is generally located parallel to, and spans, Ward Creek approximately 0.66 stream-miles east of its confluence with Old Alameda Creek. The downstream-most point of Ward Creek within the BSA has a drainage area of about 15 square miles. The Zone 3A, Line D Channel flows into Ward Creek, which drains outside of the BSA and then flows into Alameda Creek

immediately east of Hesperian Boulevard. Alameda Creek flows west into San Francisco Bay and is a traditional navigable water. One unnamed tributary within the northern portion of the BSA flows into Ward Creek, which captures the Zone 3A, Line D Channel, and continues west under I 880 outside of the BSA. Ward Creek includes an in-stream concrete outfall structure associated with an ACFCWCD pump station.

Table 2.3.2-1 Potential Jurisdictional Waters within the BSA

Potential Jurisdiction	Total Area (acres)	Total Linear Feet	Build Alternative 1 Impact Area (acres)	Build Alternative 2 Impact Area (acres)	Build Alternative 3 Impact Area (acres)
Riverine Perennial	3.12	3,643	3.04	3.12	3.04

Source: Horizon Water & Environment, 2019

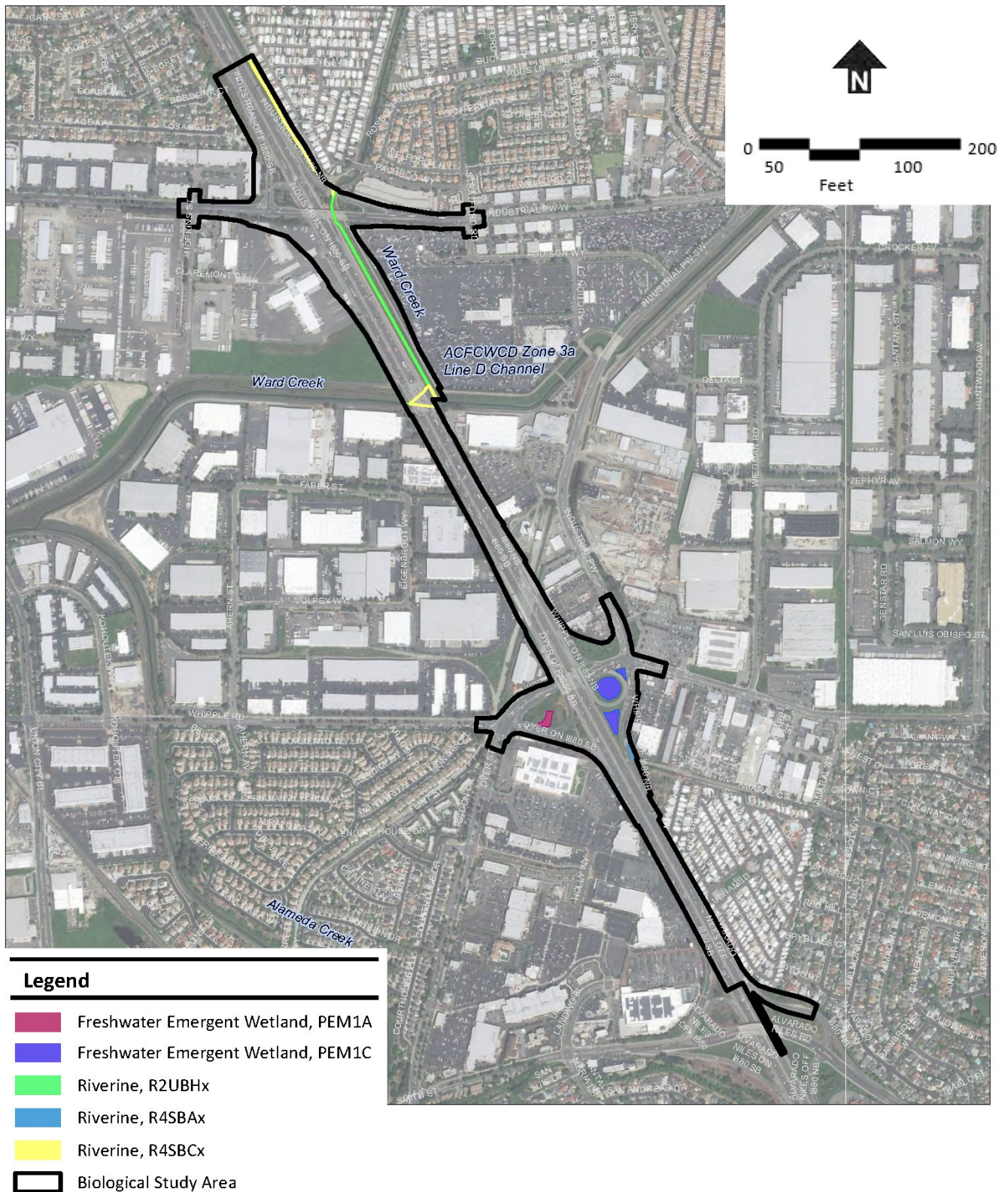
Five stormwater basins supporting wetland vegetation in the BSA and stormwater drainage ditches also occur within the BSA. However, the drainage ditches do not connect to navigable waters and were constructed for the purpose of draining uplands. These ditches were found to be potentially non-jurisdictional per Code 33 of Federal Regulations 328.3 and the CWA. As constructed stormwater features, the stormwater basins were also found to be potentially non-jurisdictional per Code 33 of Federal Regulations 328.3.

ENVIRONMENTAL CONSEQUENCES

All the Build Alternatives occur in proximity to potentially jurisdictional waters, therefore there is no practicable alternative that would avoid impacts to these resources. However, as described in Section 2.3.2, Avoidance, Minimization, and/or Mitigation Measures, measures to minimize harm to aquatic resources would be included in the project design.

Project-related construction activities associated with all Build Alternatives have the potential to impact water quality through erosion and sedimentation and would require the realignment of approximately 1,000 feet of Ward Creek southeast of the I-880/Industrial Parkway West Interchange and would impact portions of the unnamed tributary to Ward Creek and the Zone 3A, Line D Channel. These activities would result in permanent and temporary fills to be placed within Ward Creek and temporary impacts to the unnamed tributary to Ward Creek and the Zone 3A Line D Channel. These activities could in turn result in deleterious effects to the health of wildlife species present downstream. However, Ward Creek is manmade. The loss or degradation of habitat for special-status wildlife species with the BSA and downstream is anticipated to be inconsiderable.

I-880 Interchange Improvements (Whipple Road-Industrial Parkway Southwest and Industrial Parkway West) Project



Wetlands and Other Waters within the Biological Study Area

Figure

2.3-1

Source: Circlepoint, 2019

To minimize and mitigate these impacts, implementation of the Build Alternatives would include stormwater best management practices consistent with Caltrans' Construction Site Best Management Practices Manual as required under the Construction General Permit along with implementation of Measure BIO-2. Measure BIO-2 would avoid potential water quality impacts during construction by requiring the use of coffer dams and piped water. Measure BIO-3 would compensate for impacts to potential jurisdictional Waters of the U.S.

Impacts to potentially jurisdictional other Waters of the U.S. are summarized in Table 2.3.2-2. Construction of the Build Alternatives would require the following permits relating to wetlands and other waters:

- USACE, Individual Permit, Section 404, CWA
- CDFW, 1602, Lake and Streambed Alteration Agreement
- RWQCB, Section 401 Certification

Table 2.3.2-2 Impacts to Potential Jurisdictional Waters and Wetlands

Build Alternative	Area Affected (acres)	Potential USACE Jurisdiction	RWQCB Jurisdiction
Build Alternative 1	3.04	Jurisdictional non-wetland Waters of the U.S.	Jurisdictional
	1.26 - 1.33	Non-jurisdictional wetland	Jurisdictional
Build Alternative 2	3.12	Jurisdictional non-wetland Waters of the U.S.	Jurisdictional
	1.26 - 1.33	Non-jurisdictional wetland	Jurisdictional
Build Alternative 3	3.04	Jurisdictional non-wetland Waters of the U.S.	Jurisdictional
	1.26 - 1.33	Non-jurisdictional wetland	Jurisdictional

Source: Horizon Water & Environment, 2019

Build Alternatives 1 & 3

Implementation of Build Alternatives 1 and 3 would impact a 3.04-acre area of potentially jurisdictional non-wetland waters (Table 2.3.2-2). Build Alternatives 1 and 3 are expected to impact a range of 1.26 to 1.33 acres of potentially non-jurisdictional wetland (constructed stormwater basin) and non-wetland (constructed stormwater drainage) features in the BSA, depending on whether Design Variation 1 is selected.

Build Alternative 2

Implementation of Build Alternative 2 would impact a 3.12-acre area of potentially jurisdictional non-wetland waters (Ward Creek). This larger impact area, compared to Build Alternatives 1 and 3, is primarily due to the more gradual angles at which the northbound I-880/Industrial Parkway West Interchange off- and on-ramps would meet Industrial Parkway West, resulting in increased disturbance to waters (i.e., Ward Creek and the unnamed tributary to Ward Creek). Build Alternative 2 is expected to impact a range of 1.26 to 1.33 acres of potentially non-jurisdictional wetland (constructed stormwater basin) and non-wetland (constructed stormwater drainage) features in the BSA, depending on whether Design Variation 1 is selected.

No-Build Alternative

The No-Build Alternative assumes that the I-880/Whipple Road-Industrial Parkway Southwest and I-880/Industrial Parkway West interchanges would remain in their existing condition and no further action or improvements would occur. Under the No-Build Alternative, the existing roadways would remain unchanged except for planned and programmed improvements outside of the BSA. Therefore, no impacts to wetlands and other waters would occur under the No-Build Alternative.

Cumulative Impacts

The BSA is relatively developed and fragmented by development and transportation infrastructure. This condition is reflected in the quality of aquatic resources in the Ward Creek watershed. For example, Ward Creek itself has been identified by the Alameda County Public Works Agency as a manmade creek. Project-related impacts to potentially non-jurisdictional wetlands and jurisdictional waters would be mitigated through compensation. The overall scale of riverine and freshwater marsh within the 1,000-acre Ward Creek watershed would not be substantially affected by the project. These factors indicate that the incremental contribution of the project to the cumulative impact of past, present, and reasonably foreseeable future projects in the Ward Creek watershed would not be considerable. Therefore, the project would not substantially contribute to the loss of wetlands or other waters in the region.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Measure BIO-2: Prior to conducting work within the unnamed tributary to Ward Creek, Ward Creek, the Zone 3A Line D Channel, stormwater infrastructure, or stormwater basins, the contractor will implement clear-water diversions (e.g., coffer dams and piping water through the work area) spanning in-water work areas to avoid water quality impacts and potential impacts to aquatic habitat for wildlife.

Compensatory Mitigation

Measure BIO-3: Compensatory mitigation will be required for impacts to aquatic resources that would result from Ward Creek realignment. Compensatory mitigation would occur at a minimum one-to-one ratio (impact area to compensation area) to assure no-net-loss of wetlands. The final mitigation ratio for wetlands and waters will ultimately be determined through coordination with RWQCB and USACE (non-wetland waters only) during the Section 404 permitting process. Compensatory mitigation may occur through on- or off-site mitigation, the purchase of mitigation bank credits, and/or payment of an in-lieu fee, or a combination of one or more of these methods. On- and off-site mitigation options include preservation, enhancement, and restoration of the values and functions of wetlands and other potential Waters of the U.S.

2.3.3 PLANT SPECIES

REGULATORY SETTING

Federal and State

USFWS and CDFW have regulatory responsibility for the protection of special-status plant species. “Special-status” species are selected for protection because they are rare and/or subject to population and habitat declines. Special status is a general term for species that are provided varying levels of regulatory protection. The highest level of protection is given to threatened and endangered species; these are species that are formally listed or proposed for listing as endangered or threatened under FESA and/or the CESA. Please see Section 2.3.5, Threatened and Endangered Species in this document for detailed information about these species. Threatened and endangered species or habitat of such species is not likely to occur within the BSA.

This section of the document discusses all other special-status plant species, including CDFW species of special concern, USFWS candidate species, and CNPS rare and endangered plants.

The regulatory requirements for FESA can be found at 16 U.S. Code Section 1531, et seq. See also 50 CFR Part 402. The regulatory requirements for CESA can be found at CFGC, Section 2050, et seq. Department projects are also subject to the Native Plant Protection Act, found at CFGC, Section 1900-1913, and CEQA, found at California Public Resources Code, Sections 21000-21177.

AFFECTED ENVIRONMENT

The study area for plant species includes all areas of ground disturbance and aquatic disturbance that would occur under the Build Alternatives. Twenty-two special-status plant species were identified by The California Natural Diversity Database (CNDDDB), CNPS, National Marine Fisheries Service (NMFS), and USFWS database searches as having the potential to occur in the region (see the NES for a full list of these plant species). The CNDDDB was queried for all occurrence records centered on the 7.5-minute Newark U.S. Geologic Survey Quadrangles encompassing the BSA. No special status plant species were encountered during biological surveys, and such plants are unlikely to occur in the BSA due to poor habitat conditions.

ENVIRONMENTAL CONSEQUENCES

Build Alternatives

No special-status plant species were observed within the BSA, and such plants are unlikely to occur in the BSA due poor habitat conditions. Given this, the Build Alternatives would have no effect on special-status plant species.

No-Build Alternative

Under the No-Build Alternative, the existing roadways would remain unchanged except for planned and programmed improvements. The No-Build Alternative would have no effect on special-status plant species.

Cumulative Impacts

As discussed, special-status species are unlikely to occur within the BSA; therefore, the project would not contribute to a cumulative effect.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

No avoidance, minimization, and/or mitigation measures are necessary because the Build Alternatives would not affect special-status plant species.

2.3.4 ANIMAL SPECIES

REGULATORY SETTING

Federal and State

Many federal and state laws regulate impacts to wildlife. The USFWS, the NMFS, and the CDFW are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with animals not listed or proposed for listing under FESA or CESA. Species listed or proposed for listing as threatened or endangered are discussed in Section 2.3.5, Threatened and Endangered Species below. All other special-status animal species are discussed here, including CDFW fully protected species and species of special concern, and USFWS or NMFS candidate species.

Federal laws and regulations relevant to wildlife include the following:

- NEPA
- Migratory Bird Treaty Act (MBTA)
- Fish and Wildlife Coordination Act

State laws and regulations relevant to wildlife include the following:

- CEQA
- Sections 1600 – 1603 of the CFGC
- Sections 4150 and 4152 of the CFGC
- Sections 3503 and 3505.5 of the CFGC

LOCAL REGULATIONS

AFFECTED ENVIRONMENT

The study area for animal species includes all areas of ground disturbance and aquatic disturbance that would occur under the Build Alternatives. The identification of special-status animal species with the potential to occur in the BSA is based on a search of USFWS, CNDDDB, and NMFS databases. CNDDDB searches centered on the 7.5-minute Newark U.S. Geologic Survey Quadrangles encompassing the BSA. These searches identified a total of 37 special-status animal species with potential to occur in the region (see the NES for a full list of species). Based on biological surveys, suitable habitat exists within the BSA for three of these species: the western pond turtle, Alameda song sparrow, and saltmarsh common

yellowthroat. Although these species have the potential to occur within the BSA, none were observed during biological surveys.

Alameda Song Sparrow

The Alameda song sparrow is a California species of special concern that resides in tidal salt marshes and pickleweed marshes within the region. While there are no CNDDDB occurrences of the Alameda song sparrow within 2 miles of the BSA, it has the potential to occur in marginally suitable habitat present in Ward Creek, immediately downstream of the BSA.

Saltmarsh Common Yellowthroat

The saltmarsh common yellowthroat is a California species of special concern. Residing in fresh and saltwater marshes within the region, the saltmarsh common yellowthroat has the potential to occur in marginally suitable habitat present in Ward Creek, immediately downstream of the BSA.

The Western Pond Turtle

The western pond turtle is a California species of special concern and is a thoroughly aquatic turtle. It resides in ponds, marshes, rivers, and streams within the region. While there are no CNDDDB occurrences of the western pond turtle within 2 miles of the BSA, it has the potential to occur in marginally suitable habitat present in Ward Creek (potentially jurisdictional Waters of the U.S.) and stormwater basins within the BSA.

Fish Species

As discussed in Section 2.3.1, Natural Communities, tidal gates prevent the entry of special-status fish into the BSA and none are expected to occur within the project site.

Other Common Species within the BSA

Wildlife species typically associated with developed, landscaped, and arroyo willow stand areas include striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), and Virginia opossum (*Didelphis virginiana*). Wildlife observed in developed cover includes domestic cat (*Felis catus*), mourning dove, black phoebe, American crow (*Corvus brachyrhynchos*), turkey vulture (*Cathartes aura*), and European starling (*Sturnus vulgaris*). Three inactive mud cup nests were located under the I-880/Industrial Parkway West overcrossing immediately above Ward Creek. These inactive nests may have been formerly used during the past nesting season by cliff swallow (*Petrochelidon pyrrhonota*) or black phoebe (*Sayornis nigricans*).

Wildlife observed in ruderal and California annual grassland includes western fence lizard (*Sceloporus occidentalis*), mourning dove (*Zenaida macroura*), Eurasian collared-dove (*Streptopelia decaocto*), black phoebe (*Sayornis nigricans*), dark-eyed junco (*Junco hyemalis*).

Common wildlife typically associated with open water in the region include mosquitofish (*Gambusia affinis*), carp (*Cyprinus carpio*), sunfish (*Lepomis microlophus*), and Sierran treefrog (*Pseudacris sierra*). Wildlife species observed in open water include ducks (*Anas platyrhynchos*), great egret (*Ardea alba*), snowy egret (*Egretta thula*), great blue heron (*Ardea herodias*), and American coots (*Fulica americana*).

Wildlife associated with freshwater marsh vegetation includes the species described associating to open water above, as well as red-wing blackbirds (*Agelaius phoeniceus*) that could nest in the emergent marsh vegetation.

ENVIRONMENTAL CONSEQUENCES

Alameda Song Sparrow and Saltmarsh Common Yellowthroat

Build Alternatives

Marginally suitable nesting habitat for Alameda song sparrow and saltmarsh common yellowthroat is present within emergent vegetation along Ward Creek immediately downstream of the BSA, but not within the BSA itself. While direct effects would be limited to the BSA, construction noise and vibration could indirectly affect active nests of both bird species immediately west of the BSA. Such indirect effects may disrupt nesting activity or nest fitness and could result in nest abandonment, potentially to the point of nestling mortality. Therefore, active nests of either species could be indirectly affected by construction of the project.

Implementation of Measure BIO-4 would avoid effects to active nests of Alameda song sparrow and saltmarsh common yellowthroat adjacent to the BSA. This avoidance and minimization measure requires surveys to identify active nesting sites and the use of no-disturbance buffers around nests if nests are encountered.

No-Build Alternative

Under the No-Build Alternative, the existing roadways would remain unchanged except for planned and programmed improvements. Thus, the No-Build Alternative would have no effect on Alameda song sparrow or saltmarsh common yellowthroat.

Western Pond Turtle

Build Alternatives

Construction

Up to 4.38 acres of potential aquatic habitat for western pond turtle would be directly affected during construction of the Build Alternatives. Realigning Ward Creek and reconfiguring stormwater basin margins would result in direct effects through a temporary loss of aquatic habitat. Additionally, construction could result in direct mortality or harassment of individuals and the temporarily loss of aquatic habitat. The realigned segment of Ward Creek and reconfigured stormwater basin margins are ultimately expected to provide similar or improved aquatic habitat conditions for the western pond turtle compared with existing conditions. Further, temporary effects would occur on a small fraction of suitable habitat compared to available habitat within the region, and better-quality habitat is present within the BSA outside of the area of direct effects. Therefore, no net loss of habitat would occur. Indirect effects during construction include potential aquatic habitat degradation from erosion and sedimentation.

Implementation of Measure BIO-2 and Measure BIO-5 would avoid potential effects to the species by requiring specific construction measures. These include the use of coffer dams, water piping, the placement of wildlife exclusion fencing, and a preconstruction survey for the western pond turtle.

No-Build Alternative

Under the No-Build Alternative, the existing roadways would remain unchanged except for planned and programmed improvements. Thus, the No-Build Alternative would have no effect on the western pond turtle.

Nesting Birds

Build Alternatives

There is suitable nesting habitat for migratory nesting birds in and around the BSA. Therefore, MBTA-protected bird species could nest within and near the BSA. During construction, active nests could be affected by noise and vibration from construction equipment and activities such as demolition and grading. This may disrupt nesting activity or the quality of nests, resulting in nest abandonment and potentially nestling mortality. Therefore, active nests of MBTA-protected species could be affected by the Build Alternatives.

Implementation of Measure BIO-4 would avoid effects to active bird nests within and adjacent to the BSA by enforcing seasonal work windows (where feasible), requiring

preconstruction surveys to identify active nesting sites, and the use of no-disturbance buffers around nests if nests are encountered.

No-Build Alternative

Under the No-Build Alternative, the existing roadways would remain unchanged except for planned and programmed improvements. Thus, the No-Build Alternative would have no effect on nesting birds.

Cumulative Impacts

Since both the potential direct and indirect effects to the western pond turtle would be avoided, and habitat impacts would be offset through Measure BIO-2 and Measure BIO-5, the project is not expected to result in adverse effects to western pond turtle. Therefore, the project would not have a substantial contribution to adverse effects to western pond turtle in the immediate region.

Effects on nesting birds and species-of-special-concern birds would be avoided through the implementation of Measure BIO-4. Therefore, the project would not adversely affect nesting birds. Because impacts would be avoided, the project would not have a substantial contribution to adverse effects on nesting birds in the immediate region.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Measure BIO-2: Prior to conducting work within the unnamed tributary to Ward Creek, Ward Creek, the Zone 3A Line D Channel, stormwater infrastructure, or stormwater basins, the contractor will implement clear-water diversions (e.g., coffer dams and piping water through the work area) spanning planned in-water work areas to avoid downstream water quality impacts .

Measure BIO-4: Because tree removal, clearing and grubbing, and other activities are necessary for implementation of the project, the contractor will remove trees, inactive nests, and other nesting substrate (e.g., trees, shrubs, structures, emergent vegetation) and install nest exclusion measures (e.g., non-mono-filament netting, bird spikes, plastic sheeting, mesh, and fill cavities) during the non-nesting season (October 1 to January 31) within the project footprint to the extent possible. Demolition of structures will be conducted during the non-nesting season to the extent feasible. The contractor will avoid initiating vegetation clearing during the nesting bird season (February 1 to September 30) to the extent feasible.

If initiation of vegetation clearing, ground-disturbance, or other construction activities during the nesting bird season is unavoidable, the project contractor will retain a qualified biologist with experience conducting nesting bird surveys. The biologist will conduct a pre-

construction survey for active bird nests no more than three days prior to the start of construction activities. The biologist will conduct a survey of suitable nesting habitat within the BSA and a surrounding 250-foot buffer during the nesting season to ensure that no active bird nests (including those belonging to Alameda song sparrow or saltmarsh common yellowthroat) are present prior to vegetation removal or project-related disturbance, whichever occurs first.

If an active nest is identified, a no-disturbance buffer will be established until the young are no longer dependent on the nest for survival as determined by a qualified biologist and in consultation with CDFW. The no-disturbance buffer is typically 100 feet around active nests of Alameda song sparrow and saltmarsh common yellowthroat.

If construction activities stop for a period of five days or more during the nesting bird season within a portion of the project (beyond 250 feet of ongoing construction activities), a subsequent nesting bird survey will be conducted by a biologist no more than three days prior to resumption of construction at that location.

Should work within the no-disturbance buffer of an active nest be necessary, the biologist will monitor work occurring within no-disturbance buffer around an active nest to determine if disturbance or alteration of nesting behavior is affected by construction activities. If the biologist determines that nesting behavior is affected by construction activities, then construction within the no-disturbance buffer will cease immediately and equipment and personnel will leave the buffer. No-disturbance buffer modifications can be made based on the professional opinion and observations of the biologist, the degree of background noise, and the physical situation of the nest through coordination between the biologist and CDFW.

Measure BIO-5: The contractor will install wildlife exclusion fencing (i.e., silt fence) along the banks of stream segments and basins within 100 feet of the proposed Ward Creek realignment segment and stormwater basin margin reconfiguration areas to prevent movement of the western pond turtle into the work area.

Following the installation of wildlife exclusion fencing, and no more than 24 hours prior to dewatering or construction activities to realign Ward Creek and reconfigure stormwater basin margins, a qualified biologist will survey suitable habitat within the proposed realignment stream segment to determine if the species is present. Further, a qualified biologist will monitor all in-water work, dewatering, and ground-disturbing realignment activities within aquatic habitat to avoid impacts to the western pond turtle if present.

If the western pond turtle is found during any phase of in-water work, dewatering, or ground disturbance associated with the realignment of Ward Creek, the biologist will relocate any western pond turtle individuals to adjacent segments of the stream outside of

the proposed work area following CDFW's authorization to do so. The biologist will implement no-disturbance buffers if a suspected nest containing eggs or young is identified within the BSA.

2.3.5 THREATENED AND ENDANGERED SPECIES

REGULATORY SETTING

Federal and State

The primary federal law protecting threatened and endangered species is FESA: 16 Code of Federal Regulations Section 1531, et seq. See also 50 CFR 402. This act and later amendments provide for the conservation of endangered and threatened species and the ecosystems upon which they depend. Under section 7 of this act, federal agencies, such as the FHWA (and Caltrans, as assigned), are required to consult with the USFWS and the NMFS to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. The outcome of consultation under Section 7 may include a biological opinion with an incidental take statement or a letter of concurrence. Section 3 of FESA defines take as “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or any attempt at such conduct”.

California has enacted a similar law at the state level, CESA, CFGC Section 2050, et seq. CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate planning to offset project-caused losses of listed species populations and their essential habitats. CDFW is the agency responsible for implementing CESA. Section 2080 of CFGC prohibits "take" of any species determined to be an endangered species or a threatened species. Take is defined in Section 86 of CFGC as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill". CESA allows for take incidental to otherwise lawful development projects; for these actions an incidental take permit is issued by CDFW. For species listed under both FESA and CESA requiring a biological opinion under section 7 of FESA, the CDFW may also authorize impacts to CESA species by issuing a consistency determination under Section 2080.1 of the CFGC.

Another federal law, the Magnuson-Stevens Fishery Conservation and Management Act of 1976, was established to conserve and manage fishery resources found off the coast, as well as anadromous species and Continental Shelf fishery resources of the U.S. by exercising (A) sovereign rights for the purposes of exploring, exploiting, conserving, and managing all fish within the exclusive economic zone established by Presidential Proclamation 5030, dated March 10, 1983, and (B) exclusive fishery management authority beyond the exclusive economic zone over such anadromous species, Continental Shelf fishery resources, and fishery resources in special areas.

AFFECTED ENVIRONMENT

Federally Listed Species

The study area for animal species includes all areas of ground disturbance and aquatic disturbance that would occur under the Build Alternatives. Lists of USFWS- and NMFS-listed species potentially occurring in the BSA and vicinity were obtained on February 7 and March 4, 2019, respectively. Additionally, CNDDDB and CNPS lists of special-status species occurrences in the BSA and surrounding vicinity, including federally listed species, were obtained prior to biological surveys. Recent CNDDDB and CNPS lists were queried on July 6, 2020.

On April 12, 2018, Caltrans consulted with NMFS to confirm that essential fish habitat for chinook salmon is absent in the BSA, as downstream tidal gates block anadromous fish movement through drainages within the BSA. Based on the results of these lists, NMFS confirmation, and the result of field surveys, no federally listed species are expected to occur within the BSA because of its location within a relatively dense urban and suburban environment, existing fragmentation, and lack of suitable habitat.

Therefore, the project is anticipated to have no effect on federally listed species and section 7 consultation with USFWS and NFMS pursuant to FESA is not required. The “no effect” determination has been made for the federally listed species shown in Table 2.3.5-1.

Table 2.3.5-1 Federally Listed Species Reviewed for their Potential to Occur Within the Biological Study Area

Common Name	Scientific Name	Federal Status	Section 7 Effect Finding	Occurrence in the BSA
Plants				
Santa Cruz tarplant	<i>Holocarpha macradenia</i>	Endangered	No Effect	Not Likely to Occur: Suitable grassland habitat is present in the BSA, yet the limited grassland cover within the BSA is relatively fragmented and disturbed.

CHAPTER 2.3 AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES,
AND AVOIDANCE MINIMIZATION AND/OR MITIGATION MEASURES

Common Name	Scientific Name	Federal Status	Section 7 Effect Finding	Occurrence in the BSA
Contra Costa goldfields	<i>Lasthenia conjugens</i>	Endangered	No Effect	Not Likely to Occur: Suitable grassland habitat is present in the BSA, yet the limited grassland cover within the BSA is relatively fragmented and disturbed.
Invertebrates				
Vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	Threatened	No Effect	Not Likely to Occur: Suitable habitat may be present, yet the BSA is a relatively dense urban and suburban environment.
San Bruno elfin butterfly	<i>Callophrys mossii bayensis</i>	Endangered	No Effect	Not Likely to Occur: Suitable habitat may be present, yet the BSA is a relatively dense urban and suburban environment
Vernal pool tadpole shrimp	<i>Lepidurus packardi</i>	Endangered	No Effect	Not Likely to Occur: Suitable habitat may be present, yet the BSA is a relatively dense urban and suburban environment
Amphibians				
California tiger salamander	<i>Ambystoma californiense</i>	Threatened	No Effect	Not Likely to Occur: Suitable aquatic and upland habitat is absent from the BSA.
California red-legged frog	<i>Rana draytonii</i>	Threatened	No Effect	Not Likely to Occur: Suitable habitat may be present, yet the BSA is a relatively dense urban and suburban environment

CHAPTER 2.3 AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES,
AND AVOIDANCE MINIMIZATION AND/OR MITIGATION MEASURES

Common Name	Scientific Name	Federal Status	Section 7 Effect Finding	Occurrence in the BSA
Reptiles				
Alameda whipsnake	<i>Masticophis lateralis euryxanthus</i>	Threatened	No Effect	Not Likely to Occur: Suitable chaparral, woodland, and grassland habitat are absent from the BSA.
Birds				
Western snowy plover	<i>Charadrius alexandrinus nivosus</i>	Threatened	No Effect	Not Likely to Occur: Suitable habitat may be present, yet the BSA is a relatively dense urban and suburban environment
California Ridgway's rail	<i>Rallus obsoletus</i>	Endangered	No Effect	Not likely to Occur: Suitable saltwater and brackish marsh habitat is absent from the BSA.
California least tern	<i>Sternula antillarum browni</i>	Endangered	No Effect	Not likely to Occur: Suitable nesting and foraging habitat is absent from the BSA.
Mammals				
Salt marsh harvest mouse	<i>Reithrodontomys raviventris</i>	Endangered	No Effect	Not Likely to Occur: Suitable saline wetland habitat is absent from the BSA.

Common Name	Scientific Name	Federal Status	Section 7 Effect Finding	Occurrence in the BSA
Fish				
Green sturgeon – southern DPS	<i>Acipenser medirostris</i>	Threatened	No Effect	Not Likely to Occur: The BSA is not within the known current range of this species.
Delta smelt	<i>Hypomesus transpacificus</i>	Threatened	No Effect	Not Likely to Occur: The BSA is not within the known current range of this species.
Steelhead – Central California coast	<i>Oncorhynchus mykiss irideus</i>	Threatened	No Effect	Not Likely to Occur: Suitable habitat may be present, but the BSA is upstream of tides gate which would prevent passage of steelhead into the BSA.
Longfin smelt	<i>Spirinchus thaleichthys</i>	Threatened	No Effect	Not Likely to Occur: The BSA is upstream of tides gate which would prevent passage of longfin smelt into the BSA.

Source: Horizon Water & Environment, 2019

State Listed Species

Based on a review of the CNDDDB and CNPS lists of special-status species occurrences in the BSA and results of biological surveys, no state threatened or endangered species are expected to occur within the BSA (Table 2.3.5-2). Therefore, the project is anticipated to have no effect on state listed species and consultation with CDFW pursuant to the CESA is not required.

Table 2.3.5-2 State Listed Species Reviewed for their Potential to Occur within the Biological Study Area

Common Name	Scientific Name	State Status	Occurrence in the BSA
Plants			
Santa Cruz tarplant	<i>Holocarpha macradenia</i>	Endangered	Not Likely to Occur: Suitable grassland habitat is present in the BSA, yet the limited grassland cover within the BSA is relatively fragmented and disturbed.
Amphibians			
California tiger salamander	<i>Ambystoma californiense</i>	Threatened	Not Likely to Occur: Suitable aquatic and upland habitat is absent from the BSA.
Reptiles			
Alameda whipsnake	<i>Masticophis lateralis euryxanthus</i>	Threatened	Not Likely to Occur: Suitable chaparral, woodland, and grassland habitat are absent from the BSA.
Birds			
Tricolored blackbird	<i>Agelaius tricolor</i>	Candidate Endangered	Not Likely to Occur: Suitable freshwater marsh breeding habitat is not present within the BSA, as the freshwater marshes are too small and lack suitable adjacent foraging habitat to support a breeding colony.
California black rail	<i>Laterallus leucocephalus</i>	Endangered	Not expected: Marginally suitable habitat is present in Ward Creek downstream of the BSA, but the scarcity of vegetation reduces the likelihood for this species to occur.

CHAPTER 2.3 AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES,
AND AVOIDANCE MINIMIZATION AND/OR MITIGATION MEASURES

Common Name	Scientific Name	State Status	Occurrence in the BSA
California Ridgway's rail	<i>Rallus obsoletus</i>	Threatened	Not likely to occur: Suitable saltwater and brackish marsh habitat is absent from the BSA.
Bank swallow	<i>Riparia riparia</i>	Endangered	Not likely to occur: Suitable nesting habitat (vertical banks or cliffs with sandy nesting areas) is absent from the BSA.
California least tern	<i>Sternula antillarum browni</i>	Endangered	Not likely to occur: Suitable nesting and foraging habitat is absent from the BSA.
Mammals			
Salt marsh harvest mouse	<i>Reithrodontomys raviventris</i>	Endangered	Not Likely to Occur: Suitable saline wetland habitat is absent from the BSA.
Fish			
Delta Smelt	<i>Hypomesus transpacificus</i>	Endangered	Not Likely to Occur: The BSA is not within the known current range of this species.
Longfin smelt	<i>Spirinchus thaleichthys</i>	Threatened	Not Likely to Occur: The BSA is upstream of tides gate which would prevent passage of longfin smelt into the BSA.

Source: Horizon Water & Environment, 2019

ENVIRONMENTAL CONSEQUENCES

Build Alternatives

Federally Listed Species

Biological surveys for federally listed species and substantial habitat for such species were negative, and a “no effects” determination has been made for federally listed species with the potential to occur in the project vicinity. Therefore, the Build Alternatives would have no effect on federally listed species.

State Listed Species

Based on a review of the CNDDDB and CNPS lists of special-status species and results of biological surveys, no state threatened or endangered species or their habitat are expected to occur within the BSA. Therefore, the Build Alternatives would have no effect on state listed species.

No-Build Alternative

Under the No-Build Alternative, the existing roadways would remain unchanged except for planned and programmed improvements. Thus, the No-Build Alternative would have no effect on state or federally listed species.

Cumulative Impacts

As discussed, the Build Alternatives would have no effect on threatened and endangered animal species or habitat. Therefore, the Build Alternatives would not contribute to a cumulative effect.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

As discussed, the Build Alternatives would have no effect on threatened and endangered animal species or habitat. Therefore, no avoidance, minimization, or mitigation would be required.

2.3.6 INVASIVE SPECIES

REGULATORY SETTING

Federal

On February 3, 1999, President William J. Clinton signed EO 13112 requiring federal agencies to combat the introduction or spread of invasive species in the U.S. The order defines invasive species as “any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health”. FHWA guidance issued August 10, 1999 directs the use of the state’s invasive species list, maintained by the California Invasive Species Council to define the invasive species that must be considered as part of the NEPA analysis for a proposed project.

State

No state regulations governing the control of invasive species would be relevant to the project.

AFFECTED ENVIRONMENT

The study area for invasive species includes all areas of ground disturbance and aquatic disturbance that would occur under the Build Alternatives. The invasive plant species listed in Table 2.3.6-1 were identified in numerous locations in the landscaped and ruderal areas and along surface roads within the BSA. Invasive plants observed included a broad range of species ranging from trees (such as Peruvian pepper trees and olive trees) to grasses and weeds (such as yellow star thistle, bull thistle, and harding grass), and aquatic species (such as floating primrose willow). Invasive birds, mammals, amphibians, reptiles, or fish were not observed in the BSA.

Table 2.3.6-1 Invasive Species Observed in the BSA

Scientific Name	Common Name
<i>Acacia melanoxylon</i>	blackwood acacia
<i>Avena fatua</i>	wild oat
<i>Brassica nigra</i>	black mustard
<i>Brassica rapa</i>	field mustard
<i>Bromus diandrus</i>	ripgut brome

CHAPTER 2.3 AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES,
AND AVOIDANCE MINIMIZATION AND/OR MITIGATION MEASURES

Scientific Name	Common Name
<i>Bromus horidiaceus</i>	soft chess
<i>Bromus madritensis ssp. rubens</i>	red brome
<i>Carduus pycnocephalus</i>	Italian thistle
<i>Centaurea solstitialis</i>	yellow star thistle
<i>Cirsium vulgare</i>	bull thistle
<i>Conium maculatum</i>	poison hemlock
<i>Convolvulus arvensis</i>	field bindweed
<i>Cotula coronopifolia</i>	common brassbuttons
<i>Erodium cicutarium</i>	Redstem filaree
<i>Eucalyptus globulus</i>	blue gum eucalyptus
<i>Foeniculum vulgare</i>	fennel
<i>Hordeum murinum spp. leporinum</i>	foxtail barley
<i>Hypochaeris radicata</i>	rough cat's ear
<i>Ludwigia peploides</i>	floating primrose-willow
<i>Malva nicaeensis</i>	bull mallow
<i>Myoporum laetum</i>	Ngaio tree
<i>Nicotiana glauca</i>	tree tobacco
<i>Olea europaea</i>	olive
<i>Phalaris aquatica</i>	Harding grass
<i>Phoenix canariensis</i>	Canary Island date palm
<i>Plantago lanceolate</i>	English plantain
<i>Polypogon monspeliensis</i>	rabbitsfoot grass
<i>Prunus cerasifera</i>	cherry plum
<i>Raphanus sativus</i>	wild radish
<i>Rumex crispus</i>	curly dock
<i>Schinus mole</i>	Peruvian pepper tree
<i>Silybum marianum</i>	milk thistle
<i>Stipa miliacea</i>	smilgrass

Scientific Name	Common Name
<i>Trifolium hirtum</i>	rose clover
<i>Vicia villosa ssp. Varia</i>	winter vetch
<i>Washingtonia robusta</i>	Mexican fanpalm

Source: Horizon Water & Environment, 2019

ENVIRONMENTAL CONSEQUENCES

Build Alternatives

Implementation of the Build Alternatives would disturb invasive plants and soil within the BSA. Because the BSA is known to contain several invasive plant species, construction activities could lead to the spread or introduction of invasive plants elsewhere. Since no invasive animal species were observed within the BSA, the Build Alternatives would be unlikely to result in the spread of invasive animals.

Construction of the Build Alternatives could spread invasive plant species to areas where they are absent outside of the BSA if invasive plants are removed during clearing, grubbing, and construction and are not disposed of or transported properly. Implementation of Measure BIO-6 would minimize the potential for construction activities to spread or introduce invasive plants elsewhere. Measure BIO-6 would require the clearing and proper disposal of invasive vegetation, the removal any plant material brought in on construction equipment and reseeding disturbed areas with native plants.

No-Build Alternative

Under the No-Build Alternative, the existing roadways would remain unchanged except for planned and programmed improvements outside of the BSA. Disturbance of invasive plants and soil within the BSA would not occur. Therefore, the No-Build Alternative would have no effect on the spread or introduction of invasive species.

Cumulative Impacts

The cumulative impacts setting includes invasive species within and surrounding the BSA. Cumulative effects to invasive species would occur if planned and foreseeable development in the area, when taken in combination with the project, would result in the spread or distribution of invasive species. All federally funded projects would comply with EO 13112, which requires all federal agencies prevent the introduction of invasive species and provide for restoration of native species. Additionally, the project would minimize the potential to spread or introduce invasive species and plant native species through Measure BIO-6. Therefore, the project would not contribute to the potential spread or introduction

of invasive plants in the immediate region. Given this, there would be no cumulative effect related to invasive species.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Measure BIO-6: The contractor will implement the following practices to minimize the potential to introduce or spread invasive plant species:

- Prior to initial disturbance, invasive plant locations will be identified, mapped, and cleared. All vegetation material removed will be adequately contained (e.g., bagged) and disposed of in a landfill or incinerated off-site, with caution exercised to prevent seed dispersal.
- Construction equipment shall be certified as “weed-free” by Caltrans before entering the construction site. If necessary, onsite wash stations shall be established for construction equipment under the guidance of Caltrans in order to avoid and minimize the spread of invasive plants and seed within the construction area.
- After project implementation, areas of the BSA where vegetation removal occur will either be hydroseeded with native seed from a local source or planted with landscape species that occur in neighboring areas and maintained per Caltrans standards to reduce the risk of non-native and invasive species establishment. Drought-tolerant plant species that are suitable for the project site shall be used.

3.0 CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) EVALUATION

3.1 DETERMINING SIGNIFICANCE UNDER CEQA

The proposed project is a joint project by Caltrans and the FHWA and is subject to state and federal environmental review requirements. Project documentation, therefore, has been prepared in compliance with both CEQA and NEPA. FHWA's responsibility for environmental review, consultation, and any other actions required by applicable federal environmental laws for this project are being, or have been, carried out by Caltrans pursuant to 23 USC 327 and the Memorandum of Understanding dated December 23, 2016 and executed by FHWA and Caltrans. The Department is the lead agency under CEQA and NEPA.

One of the primary differences between NEPA and CEQA is the way significance is determined. Under NEPA, significance is used to determine whether an EIS, or a lower level of documentation, will be required. NEPA requires that an EIS be prepared when the proposed federal action (project) as a whole has the potential to "significantly affect the quality of the human environment." The determination of significance is based on context and intensity. Some impacts determined to be significant under CEQA may not be of sufficient magnitude to be determined significant under NEPA. Under NEPA, once a decision is made regarding the need for an EIS, it is the magnitude of the impact that is evaluated, and no judgment of its individual significance is deemed important for the text. NEPA does not require that a determination of significant impacts be stated in the environmental documents.

CEQA, on the other hand, does require the Department to identify each "significant effect on the environment" resulting from the project and ways to mitigate each significant effect. If the project may have a significant effect on any environmental resource, then an EIR must be prepared. Every significant effect on the environment must be disclosed in the EIR and mitigated if feasible. In addition, the CEQA Guidelines list several "mandatory findings of significance," which also require the preparation of an EIR. There are no types of actions under NEPA that parallel the findings of mandatory significance of CEQA. This chapter discusses the effects of this project and CEQA significance.

IMPACTS AND MITIGATION MEASURES

This section lists checklist questions that are used to evaluate impacts, followed by a discussion of the methodology used to evaluate impacts against appropriate criteria. This section then discusses impacts that would result from implementation of the project. Checklist questions are assigned a letter in each section, to make navigation in the impacts discussion more efficient for the reader. The impact evaluation in this section takes into account the whole action associated with the project, including offsite and onsite, project and cumulative, direct and indirect, and construction and operational impacts.

Full descriptions of each avoidance, minimization, and mitigation measure referred to under each section can be found in Sections 2.1, Human Environment through 2.3, Biological Environment.

CLASSIFICATION OF IMPACTS

Under CEQA, a variety of terms are used to describe adverse impacts. The definition of terms used in this section is presented below.

Significant and Unavoidable Impact

A significant and unavoidable impact is an impact that exceeds the defined standards of significance and cannot be avoided or reduced to a less-than-significant level through implementation of reasonable and feasible mitigation measures. No Significant unavoidable impacts have been identified for the project.

Significant Impact

A significant impact is an impact that exceeds the defined standards of significance and can be avoided or reduced to a less-than-significant level through implementation of reasonable and feasible mitigation measures.

Less-Than-Significant Impact

A less-than-significant impact is an impact that is adverse but that does not exceed the specified standards of significance.

No Impact

A “no impact” determination is provided when there would not be an impact to the existing environment.

3.2 CEQA ENVIRONMENTAL CHECKLIST

This checklist identifies physical, biological, social, and economic factors that might be affected by the proposed project. In many cases, background studies performed in connection with the projects will indicate that there are no impacts to a particular resource. A NO IMPACT answer in the last column reflects this determination. The words "significant" and "significance" used throughout the following checklist are related to CEQA, not NEPA, impacts. The questions in this form are intended to encourage the thoughtful assessment of impacts and do not represent thresholds of significance.

Project features, which can include both design elements of the project and standardized measures that are applied to all or most Caltrans projects such as BMPs and measures included in the Standard Plans and Specifications or as Standard Special Provisions, are considered to be an integral part of the project and have been considered prior to any significance determinations documented below. This includes measures identified as avoidance and minimization measures under NEPA, where those measures are required independent of CEQA and are implemented through existing regulation or Caltrans policy, such as the use of a design that is responsive to site-specific geotechnical risks. Avoidance and minimization measures are clearly identified where applicable. The annotations to this checklist are summaries of information contained in Chapter 2.0 in order to provide the reader with the rationale for significance determinations; for a more detailed discussion of the nature and extent of impacts, please see Chapter 2.0. This checklist incorporates by reference the information contained in Chapters 1.0 and 2.0.

The annotations to this checklist are summaries of information contained in Sections 2.1, Human Environment through 2.3, Biological Environment in order to provide the reader with the rationale for significance determinations; for a more detailed discussion of the nature and extent of impacts, please see Section 2.1, Human Environment through Section 2.3, Biological Environment. This checklist incorporates by reference the information contained in Section 2.1, Human Environment through Section 2.

3.2.1 AESTHETICS

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

CEQA SIGNIFICANCE DETERMINATIONS FOR AESTHETICS

a) Have a substantial adverse effect on a scenic vista?

And

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

No Impact. There are no scenic vistas visible from the project site within the VSA and no official designated state scenic highways or highways eligible for such designation are located within the VSA. While construction of the project would result in temporary changes to the existing visual environment, such changes would not have a substantial impact on a scenic vista or scenic resource within the VSA.

Once operational, local motorists and passengers would continue to experience views including typical roadway components such as travel lanes, median barriers, lane striping, traffic signals, lighting fixtures, and roadside landscaping. Based on the forgoing, no impact would occur.

c) Substantially degrade the existing visual character or quality of the site and its surroundings?

Less Than Significant. Implementation of the project would result in temporary and permanent changes to the visual environment within the VSA. Temporary visual impacts from short-term construction activities are anticipated. Construction activities required for implementation of the Build Alternatives would include but are not limited to; earthwork, paving, pile driving, concrete/rebar/formwork, and roadway striping. However, construction of the project would comply with all applicable construction regulations, standards, and procedures including best management practices. Project construction would be completed with standard construction equipment and protocols as described in Measure VIS-4. These protocols and equipment are required for all Caltrans projects, and are not considered mitigation. Visual impacts during construction would be temporary in nature and would not substantially degrade the existing visual character or quality of the VSA. Therefore, construction impacts would be less than significant.

Once operational, the project would moderately alter existing views within the VSA. While changes under all Build Alternatives would result in more manmade features and less vegetation, the I-880 corridor would continue to be the dominant visual feature in the urban area. Adherence to Measures VIS-1 and VIS-3 would ensure any removed landscaping would be replaced where feasible, and new structures such as retaining walls or bridges, would undergo aesthetic treatments consisting of color, texture, and/or patterning to ensure consistency within the existing transportation corridor. Measure VIS-1 requires replacement landscaping. Although Caltrans is not required to comply with local tree protection policies and ordinances, removed trees would be replaced at a minimum 1:1 ratio, where feasible. Given the industrial, developed nature of the VSA, tree removal would not significantly change the existing visual setting, and tree replacement would further ensure a significant impact does not occur. Measure VIS-3 notes specific aesthetic treatments unique to the project and would be included as a project design feature. With implementation of Measures VIS-1 and VIS-3, the moderate magnitude of change resulting from the project would be minimized and would not significantly degrade the existing visual character and visual quality of the VSA. This impact would be less than significant.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Less Than Significant. During construction of the project, new sources of light or glare would be installed within construction staging areas and along new on-and off-ramps throughout the VSA. Although this incremental increase in nighttime lighting would be temporary in nature, adherence to appropriate light and glare screening measures as required by Caltrans, such as downward cast lighting be employed at construction staging areas. With adherence to standard measures as described in Project Design Feature VIS-5, this impact would be less than significant.

Once operational, installation of lighting fixtures at proposed on-ramps and off-ramps throughout the VSA would result in an incremental increase in nighttime lighting for local motorists and passengers (see Section 2.1.6, Visual/Aesthetics). This incremental increase in nighttime lighting would not be substantial in the context of existing nighttime lighting within the VSA and would be comparable to similar freeway corridors. Incremental increases in lighting would be limited to the project right of way, would generally not be perceptible due to existing night time lighting in and around the corridor, and would not adversely affect nearby residences. Given this, this impact would be less than significant.

3.2.2 AGRICULTURE AND FOREST RESOURCES

<p>In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and the forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.</p>				
Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CEQA SIGNIFICANCE DETERMINATIONS FOR AGRICULTURE AND FOREST RESOURCES

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

And

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

No Impact. According to the California Department of Conservation’s California Important Farmland Finder, there is no Prime, Unique or Statewide Importance Farmland located

within proximity to the project area.³⁸ In addition, there is no land protected under a Williamson Act within the vicinity and implementation of the project would not conflict with existing zoning for agricultural use. Therefore, no impact would occur.

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?

And

d) Result in the loss of forest land or conversion of forest land to non-forest use?

No Impact. There are no forest lands or timberlands within or surrounding the project area. Given this, the project would not conflict with, or require rezoning of forest land to non-forest use. Therefore, no impact would occur.

e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?

No Impact. As previously discussed, there is no farmland within or surrounding the project area. Given this, the project would not require the conversion of farmland or forest land. Therefore, no impact would occur.

³⁸ California Department of Conservation, 2016. California Important Farmland Finder. Available online at: <https://maps.conservation.ca.gov/DLRP/CIFF/>; last accessed: October 4, 2019

3.2.3 AIR QUALITY

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations.				
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

CEQA SIGNIFICANCE DETERMINATIONS FOR AIR QUALITY

Information in this section is based on the *Air Quality Report* and Section 2.2.6.

a) Conflict with or obstruct implementation of the applicable air quality plan?

No impact. As discussed in Section 2.2.6, Air Quality, the project is included in the regional air quality conformity analysis for the current RTP, Plan Bay Area 2040. The MTC found that regionally significant projects in the San Francisco Bay Area will conform to the purpose of the SIP and not cause new air quality violations, worsen existing violations, or delay timely attainment of the relevant NAAQS as provided in Section 176(c) of the FCAA. The project is also included in the MTC's financially constrained 2019 TIP. The TIP gives priority to eligible Transportation Control Measures (TCMs) identified in the SIP and provides sufficient funds to provide for their implementation. FHWA and FTA approved MTC's conformity determination for Plan Bay Area 2040 and the 2019 TIP on December 17, 2018. Based on the project's design concept, scope, and open-to-traffic date assumptions, the project would be consistent with the regional emissions analysis performed for the current RTP and TIP and would not interfere with the timely implementation of any TCMs identified in the SIP. The project was found to be in regional conformance with the SIP and would not conflict with implementation of applicable local air quality plans. Therefore, there would be no impact.

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Less Than Significant. As discussed in Section 2.2.6, Air Quality, the Bay Area Air Basin is considered a non-attainment area for ground-level ozone and PM_{2.5} under both federal and state standards, and non-attainment for PM₁₀ under state standards. As part of an effort to attain and maintain ambient air quality standards for ozone and particulate matter, BAAQMD has established thresholds of significance for these air pollutants and their precursors. These thresholds are for ozone precursor pollutants (ROG and NO_x), PM₁₀, and PM_{2.5} and apply to both construction and operational period impacts.

As shown in Table 2.2.6-2, average daily emissions for the project would be below BAAQMD's recommended thresholds for ROG, NO_x, PM₁₀, and PM_{2.5}. The average daily emissions of ozone precursors and criteria pollutants from equipment and vehicle exhaust would be below the Bay Area Air Quality Management District's recommended thresholds, construction would not be expected to cause or contribute to, or worsen, any state air quality violations.

Neither Caltrans nor the BAAQMD has a quantitative threshold for fugitive dust emissions; however, the BAAQMD considers implementation of BMPs to control fugitive dust PM₁₀ and

PM_{2.5} during construction sufficient to reduce potential impacts from dust to a less-than-significant level. Caltrans' standard specifications and special provisions would require adherence to Measure AQ-1 which entails the use of dust control measures to minimize or eliminate impacts air quality impacts. With adherence to Caltrans' standard requirements, fugitive dust would be sufficiently controlled on the site. This impact would be less than significant.

As described above, this project is included in a conforming RTP and TIP, and therefore emissions of ozone precursors from project-related traffic are not anticipated to cause or contribute to, or worsen, any violations of the federal air quality standards for ozone. In addition, the BAAQMD adopted the 2017 CAP to plan for and achieve compliance with the federal and state ozone standards (see Local air quality regulations). This project will not interfere with the control measures described in the 2017 CAP. Furthermore, the project will provide transportation benefits that reduce pollutant emissions, including ozone precursors, by improving traffic operations and efficiency. On April 25th, 2019, the Bay Area Air Quality Conformity Task Force determined that the project is not a POAQC, and a detailed PM_{2.5} hot-spot analysis is not required for a project-level conformity determination. Therefore, the project would not be expected to cause or contribute to, or worsen, any violations of the federal air quality standards for PM_{2.5}.

Operation of the project would not result in an increase in criteria air pollutant emissions compared to the existing year conditions or the future No-Build Alternative (Table 2.2.6-3). Therefore, emissions of criteria pollutants from project-related traffic are not anticipated to cause or contribute to, or worsen, any air quality violations and this impact would be less than significant.

c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non- attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

No Impact. Improved freeway operations and projected future development in the region would result in an increase in vehicle miles traveled within the SFBAAB and related increases in vehicle emissions. Therefore, air quality impacts associated with transportation and other development projects in the SFBAAB would result in cumulative effects to air quality for permanent operational pollutant emissions.

As previously discussed, transportation plans that have been found to conform with the SIP are not considered to cause or contribute to violations of ambient air quality standards. Furthermore, a project included in a conforming plan would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard. Conforming

transportation plans are subject to a threshold of no net increase in emissions. Because the project is included in Plan Bay Area and 2015 TIP, which conform to the SIP, the project would not result in a cumulatively considerable net increase of any criteria pollutant. Therefore, this would result in no impact.

d) Expose sensitive receptors to substantial pollutant concentrations?

Less Than Significant. Some groups of people are more affected by air pollution than others and are known as sensitive receptors. The state has identified the following groups of people who are most likely to be affected by air pollution: children under 16, the elderly over 65, people conducting athletic activities, and people with cardiovascular and chronic respiratory diseases. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, outdoor athletic fields, and elementary schools. Although no schools, parks, hospitals, or convalescent homes are located within 500 feet of the project, residential single-family homes are located immediately northeast and northwest of the I-880/Industrial Parkway West interchange, and immediately west and southeast of the I-880/Whipple Road-Industrial Parkway Southwest interchange.

Because construction of all Build Alternatives is expected to last less than five years, temporary emissions of CO, PM₁₀, and PM_{2.5} are not expected to cause or contribute to, or worsen, any federal air quality violations and an evaluation of these emissions is not required for a project-level conformity determination.

The project would improve traffic operations in a populated area with nearby sensitive receptors. Traffic volumes along I-880 range from 210,000 to 238,000 AADT under 2018 conditions. Although the project has a high potential for MSAT effects because it is located in proximity to populated areas and exceeds the FHWA's AADT threshold, implementation of the project would alleviate local traffic congestion and reduce regional VMT, thus decreasing daily emissions of MSAT pollutants. The estimated daily MSAT emissions for the Build Alternatives would be approximately equal to or lower than the emissions for the No-Build Alternative. Given this, the project would not expose sensitive receptors to substantial pollutant concentrations. Please see Section 2.2.6, Air Quality in this document for detailed information about MSAT pollutants. Given the information above, this impact would be less than significant.

e) Create objectionable odors affecting a substantial number of people?

Less Than Significant. During construction of the project, temporary odors from vehicle exhaust and construction equipment would occur. Construction-related odors would disperse and dissipate and would not cause substantial odors at the closest sensitive receptors (adjacent residences). In addition, construction-related odors would be short-term and would cease upon completion of construction. Once operational, the project would not include any uses that generate substantial objectionable odors. Therefore, this impact would be less than significant.

3.2.4 BIOLOGICAL RESOURCES

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CEQA SIGNIFICANCE DETERMINATIONS FOR BIOLOGICAL RESOURCES

Information in this section is based on the *Natural Environment Study* (NES) prepared for the project.

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Less Than Significant. State and federally endangered species and habitat of such species are unlikely to occur within the BSA. Given this, construction of the project would not result in impacts on state or federally threatened or endangered species.

However, the project could affect the Alameda song sparrow, saltmarsh common yellowthroat, and western pond turtle, all considered California species of special concern. The project could also impact nests belonging to birds protected by the MBTA.

Construction of the project could result in indirect noise and vibration impacts to potential nests of the Alameda song sparrow and saltmarsh common yellowthroat immediately west of the BSA along Ward Creek. Nesting birds protected by the MBTA potentially occurring throughout the BSA could also be impacted by construction and noise impacts. In both cases, indirect impacts from the Build Alternatives could result in disruptions to nesting activity or the quality of nests, resulting in nest abandonment and potential nestling mortality. Adherence to Measure BIO-4 would avoid effects to active bird nests within and adjacent to the BSA by enforcing seasonal work windows (where feasible), requiring preconstruction surveys to identify active nesting sites, and ensuring the use of no-disturbance buffers around nests if nests are encountered. This is a standard Caltrans design measure applied universally to all projects and would be a requirement for project construction.

In addition, sedimentation during construction and the realignment of Ward Creek could negatively impact western pond turtle habitat and potentially lead to mortality of individuals during construction of the Build Alternatives. Although no western pond turtle individuals were observed during site reconnaissance, as an aquatic turtle, this species may occur in the BSA's aquatic features. Adherence to Measure BIO-2 and Measure BIO-5 would avoid potential effects to the species by requiring specific construction measures such as coffer dams, water piping, the placement of wildlife exclusion fencing, and a preconstruction survey. All of these measures are standard Caltrans design measures applied to all projects. No project-specific mitigation is required, and this impact is less than significant.

During project operation, no new noise or disturbance would occur to potential nesting sites within the BSA. With construction completed, the creek realignment and reconfigured stormwater basin margins would provide similar or improved habitat for the western pond turtle compared to current conditions. Given this, no impact would occur during operation.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?

Less Than Significant. The non-aquatic habitats present within the BSA are not sensitive biological communities because the areas are very ruderal and in an industrial area. However, the riparian habitats (the riverine perennial and wetland areas located within the BSA) would be impacted by the project through sedimentation and through the realignment of Ward Creek during construction. Sedimentation of the waters present in the BSA could degrade these habitats, and the realignment of Ward Creek would result in temporary and permanent fill of these waters. Ward Creek is in a trapezoidal, man-made channel within the project footprint, and would be realigned as a part of the project.

Implementation of the Build Alternatives would include stormwater best management practices consistent with Caltrans' Construction Site Best Management Practices Manual as required under the Construction General Permit along with implementation of Measure BIO-2. As described above, Measure BIO-2 would avoid potential water quality impacts during construction by requiring the use of coffer dams and piped water and Measure BIO-3 would compensate for impacts to jurisdictional waters of the U.S. and State. These are standard Caltrans design measures applied to all projects. With adherence to Caltrans' standard measures, this impact would be less than significant.

No disturbance would occur to riparian areas within the BSA as a result of project operation. With construction completed, the creek realignment and reconfigured stormwater basin margins would provide similar or improved riparian habitat compared to current conditions. There are no other sensitive natural communities within the BSA.

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

No Impact. As described in Section 2.3.3, Wetlands and Other Waters, no federally protected wetlands occur within the BSA. As stated in the NES, the wetlands located within the project area consist of constructed features and are not jurisdictional features. Therefore, no impact would occur during project construction or operation.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

No Impact. The BSA does not provide habitat connectivity for fish or wildlife, as tide gates downstream from the BSA block the movement of fish upstream to the BSA. The area within and around the BSA is highly urbanized and developed leaving only small, disconnected patches of habitat. Given this, construction and operation of the project would not impact wildlife or fish movement through the project area. No impact would occur.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Less Than Significant. During construction, the project would result in impacts to trees regulated by Hayward and Union City, 306 and 8 trees, respectively. Implementation of the project would require the removal of 299 to 310 regulated trees within the BSA, depending on the Build Alternative selected (Table 3.2.4-2). Adherence to Measure BIO-1 would ensure removed trees are replaced at a minimum 1:1 ratio. With adherence to Caltrans' standard design features described in Measure BIO-1, based on the context and setting of the project in an urban transportation corridor that is not easily accessible to or attractive to wildlife, this impact would be less than significant.

Table 3.2.4-1 Regulated Tree Removal by Build Alternative

	Build Alternative 1	Build Alternative 2	Build Alternative 3
Regulated Tree Removal	299-306	300-307	303-310

Source: Horizon Water & Environmental, 2019

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

No Impact. No adopted habitat conservation plan, natural community conservation plan or other approved local, regional, or state habitat conservation plan exists for the BSA or project vicinity.³⁹ Therefore, construction and operation of the project would not conflict with any such plans and no impact would occur.

³⁹ Although Goal NR-1 of Hayward’s General Plan establishes developing a habitat conservation plan in coordination with Alameda County, the cities of Fremont and Union City, the Hayward Area Recreation and Park District, and the East Bay Regional Park District as an objective, this plan has not yet been drafted. Additionally, Alameda County is participating in the preparation of the East Alameda County Conservation Strategy, a habitat conservation plan that has also not yet been drafted.

3.2.5 CULTURAL RESOURCES

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CEQA SIGNIFICANCE DETERMINATIONS FOR CULTURAL RESOURCES

a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?

No Impact. As discussed in Section 2.1.7, Cultural Resources and Tribal Cultural Resources, the APE does not contain any buildings or structures that qualify for listing on the NRHP or CRHR. The State Historic Preservation Officer concurred with the findings in the HRER and the HPSR on April 13, 2020. Therefore, no impact would occur.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?

No impact. Construction activities associated with the project would entail excavation, grading, and construction of new roadway elements. Such ground-disturbing activities would have the potential to result in impacts to buried, previously unidentified archaeological resources. While no archaeological resources have been recorded in the APE, there is the possibility that an unrecorded resource, such as cultural materials or human remains, could be unearthed during construction. However, this is unanticipated. Adherence to required Caltrans protocols described in Measure CUL-1 would ensure that if

cultural materials are discovered during construction, all earth-moving activity would cease until a qualified archeologist can assess the nature and significance of the find, thus avoiding impacts to such resources.

Once construction is complete, the project would not entail earth-moving activities with the potential to damage or discover previously unrecorded cultural resources. Given this, the transportation facility would not endanger the integrity of cultural resources long term. There would be no impact.

c) Disturb any human remains, including those interred outside of dedicated cemeteries?

No impact. While there are no previously recorded archaeological or Native American cultural resources within the APE, there is always some possibility that human remains could be unearthed during construction. Implementation of Caltrans Standard Practice CUL-2 would require the halt of further disturbances within the vicinity of the remains and would adhere to State Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98 in regard to the treatment of discovered remains. Caltrans Standard Practice CUL-2 implements existing regulations. There would be no impact.

3.2.6 GEOLOGY AND SOILS

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on expansive soil, as	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?				
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

CEQA SIGNIFICANCE DETERMINATIONS FOR GEOLOGY AND SOILS

Information in this section is based on the *Preliminary Geotechnical and Foundation Report* prepared for the project.

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?

No Impact. During an earthquake, surface rupture occurs when the ground surface is broken as a result of fault movement. Surface rupture mostly occurs along active faults. The project site is not within the Alquist-Priolo Special Study Zone and no known or mapped active faults pass through the project site. Therefore, the potential for ground surface rupture due to faulting is extremely low to non-existent. Therefore, no impact would occur.

ii) Strong seismic ground shaking?

or

iii) Seismic-related ground failure, including liquefaction?

Less than Significant. While there is a low risk of seismic-related ground failure in the form of liquefaction within the project area, regional faults could result in strong seismic groundshaking.

Potentially liquefied soils were found in borings at the project site but do not appear to be continuous throughout the site nor is there a large enough quantity to be susceptible to liquefaction. During project construction, groundshaking could pose a risk to workers through the collapse of structures. Adherence to Measure GEO-1 would ensure construction worker safety in the event of groundshaking by requiring employers to adhere to the Occupational Safety and Health Act and Caltrans' hazard-specific standards, as well as standard design and construction guidelines.

Strong groundshaking could also occur during project operation, threatening the collapse of structures and impacts to motorists travelling through the project site. Adherence to Measure GEO-2 would require incorporation of findings from structure foundation reports and geotechnical design reports, as well as standard Caltrans design features that would ensure the project design would accommodate the risks of groundshaking.

With adherence to the standard regulations and protocols described in Measures GEO-1 and GEO-2, impacts from groundshaking and liquefaction during construction and operation would be less than significant.

iv) Landslides?

No Impact. The project site and its surroundings are flat and highly urbanized. The project area does not have any steep slopes or hillsides that would be susceptible to landslides. Further, the project site is not located in a landslide hazard zone. Landslide would not pose a risk during project construction or operation. Therefore, no impact would occur.

b) Result in substantial soil erosion or the loss of topsoil?

Less than Significant. Project construction would involve ground disturbing activities such as excavation, grading, and trenching. Such activities would expose soils and increase the potential for soil erosion from wind or stormwater runoff. The project site has been rated for slight erosion hazard based on soil type. BMP's such as a temporary silt fencing, fiber rolls, check dams, temporary soil stabilizers, temporary erosion control, and other measures would be used to minimize erosion potential.

Project operation would not involve any ground disturbing activities that would result in erosion. However, the project would introduce new impervious surfaces with the potential to increase runoff and erosion. Measure WQ-2 and Measure WQ-4 would require the employment of BMPs such as revegetation and biofiltration to reduce the erosion potential of runoff from new impervious areas. With implementation of Measure WQ-2 and Measure WQ-4, this impact would be less than significant.

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

No impact. The project would not result in settlement, subsidence, liquefaction, collapse, lateral spreading, or landslide on- or off-site. As the project limits and vicinity are characterized by flat topography, landslide and lateral spreading would not pose a risk to the project or the surrounding area. No soils observed at the site are susceptible to subsidence or collapse. Therefore, no impact would occur.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

Less Than Significant. Based on available boring information, highly expansive soils such as fat clays and organic clays are present at the project site. Therefore, expansive soils would increase the risk of structural collapse threatening workers during project construction and motorists during project operation. Through the process of acquiring building, utility, conditional use, and special use permits from the City, a geotechnical report will be required by the City and the project would be required to conform standards designed to address the risk of expansive soils. There would be an impact on the structural pavement design if expansive soil is encountered in areas of pavement. Standard safety protocols described in Measure GEO-1 and Measure GEO-2 would ensure compliance with worker safety regulations and the implementation of design features to address the risks of expansive soils. Therefore, impacts from expansive soils during project construction or operation would be less than significant.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

No Impact. The project would not require the use of septic tanks during project construction or operation. Therefore, no impact would occur.

f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Less Than Significant. As discussed in Section 2.2.4, Paleontology, earthmoving and ground disturbing activities conducted during construction could impact buried paleontological resources, potentially resulting in direct damage to or destruction of unique paleontological resources or unique geologic features. Implementation of Measure PAL-1 would require preparation of a Paleontological Mitigation Plan (PMP) and would entail full-time monitoring if Pleistocene deposits are observed. In addition, work in the immediate vicinity of a discovery would be halted until it can be evaluated by a qualified paleontologist. This is a standard Caltrans design feature applied to all projects wherever paleontological resources may occur.

Once construction is complete, the project would not entail earth-moving activities with the potential to damage or discover paleontological resources or unique geologic features. Given this, the transportation facility would not endanger the integrity of paleontological resources long term. This impact would be less than significant.

3.2.7 GREENHOUSE GAS EMISSIONS

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Less Than Significant. The estimated daily CO₂ emissions for the Build Alternatives during the opening year (2025), horizon year (2040), and design year (2045) scenarios would be lower than the emissions for the No-Build Alternative, because the Build Alternatives would improve local traffic flow. Emissions for both the Build and No-Build Alternatives would also be lower in the opening year (2025), horizon year (2040), and design year (2045) compared to the existing year (2018), because federal and state fuel economy standards are expected to reduce GHG emissions over time. Please see Section 3.3.4, Operational Emissions for more details. Therefore, this impact would be less than significant.

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

No Impact. The project would not conflict with an applicable local plan, policy or regulation adopted for the purpose of reducing the emission of GHGs. Key planning and policy

documents in the City include the General Plan and CAP. The CAP was adopted in December of 2013 and included in the General Plan as an appendix item.⁴⁰

Hayward CAP Consistency

In the city of Hayward adopted its current climate action plan (CAP) in July 2014. This plan outlines strategies to reduce GHG emissions for a horizon year of 2020. However, the plan does not address meeting the requirements of SB32 (2030 emissions target).

The City's CAP recommends a citywide GHG reduction target of 20 percent below the 2005 baseline level by 2020. Improving the transportation system and operational efficiencies is the primary method to reduce GHG emissions. The CAP identifies measures to close the local emissions reduction gap and achieve an emissions reduction target consistent with AB 32. There are four of which are relevant for the project:

- M-6.1 Bikeway System- The City shall maintain and implement the Hayward Bicycle Master Plan.
- M-6.2 Encourage Bicycle- Use The City shall encourage bicycle use in all neighborhoods, especially where short trips are most common.
- M-8.1 Increase Vehicle Occupancy- The City shall work with a broad range of agencies (e.g., Metropolitan Transportation Commission, BAAQMD, AC Transit, Caltrans) to encourage and support programs that increase vehicle occupancy including the provision of traveler information, shuttles, preferential parking for carpools/vanpools, transit pass subsidies, and other methods.
- NR-2.8 Reduced Emissions for City Operations and Commutes- The City shall promote reduced idling, trip reduction, routing for efficiency, and the use of public transportation, carpooling, and alternate modes of transportation for operating City departments and City employees.

Union City Climate Action Plan Consistency

In the city of Union City adopted its current CAP in November 2010. This plan outlines strategies to reduce GHG emissions for a horizon year of 2020. However, the plan does not address meeting the requirements of SB32 (2030 emissions target).

⁴⁰ The current CAP has a horizon year of 2020. Because the project is not anticipated to be finished until after 2020, consistency with policies established in the CAP would not be sufficient to make a less-than-significant determination.

The City’s CAP recommends a citywide GHG reduction target of 30 percent below the 2005 baseline level by 2020. Improving the transportation system and operational efficiencies is one of the primary methods to reduce GHG emissions. The CAP identifies measures to close the local emissions reduction gap and achieve an emissions reduction target consistent with AB 32. There are two of which are relevant for the project:

- Measure 4.1- Ensure that City policies and budgetary processes facilitate a multi-modal transportation system within the community.
- Measure T-1.1- Continue build-out (goal of 25 percent build-out), to the extent feasible, of the Pedestrian and Bicycle Master Plan by 2020.

Applicable General Plan Policies

The City of Hayward adopted the 2014-2040 General Plan to accommodate planned housing and employment growth through 2040. As part of the Hayward’s General Plan Update, new policies were adopted that address the reduction of GHG emissions during the planning horizon of the General Plan. The city of Union City adopted the current General Plan in 2002. As part of the Union city’s General Plan, policies were adopted that address the reduction of GHG emissions in the environmental sustainability element of the General Plan.

For the project, implementation of policies that call for increased energy efficiency or reduced energy use would effectively reduce indirect GHG emissions associated with energy generation as required in the General Plan. Consistency of the project with relevant General Plan policies is described in Table 3.2.6-1.

As shown in Table 3.2.6-1 and described above, the project would not conflict with general plan policies adopted for the purpose of reducing the emissions of GHGs.

Table 3.2.6-1 Project Consistency with City of Hayward and City of Union City General Plan and CAP

Emission Reduction Policy	Project Consistency
Hayward General Plan/Hayward CAP Policies	
M-6.1 Bikeway System - The City shall maintain and implement the Hayward Bicycle Master Plan.	Consistent. Implementation of the project would create bicycle-friendly connections to the bicycle paths set forth in the Hayward Bicycle Master Plan.
M-6.2 Encourage Bicycle - The City shall encourage bicycle use in all	Consistent. Implementation of the project would provide safe bicycle passages over

neighborhoods, especially where short trips are most common.	I-880 thereby encouraging short bicycle trips to nearby businesses.
M-8.1 Increase Vehicle Occupancy - The City shall work with a broad range of agencies (e.g., Metropolitan Transportation Commission, BAAQMD, AC Transit, Caltrans) to encourage and support programs that increase vehicle occupancy including the provision of traveler information, shuttles, preferential parking for carpools/vanpools, transit pass subsidies, and other methods.	Consistent. Implementation of the project would allow Hayward to work with Caltrans to increase bicycle-friendly connections to the bicycle paths within Hayward and Union city
NR-2.8 Reduced Emissions for City Operations and Commutes - The City shall promote reduced idling, trip reduction, routing for efficiency, and the use of public transportation, carpooling, and alternate modes of transportation for operating City departments and City employees.	Consistent. Implementation of the project would reduce idling and increase route efficiency while promoting alternative modes of transportation.
Measure 4.1- Ensure that City policies and budgetary processes facilitate a multi-modal transportation system within the community.	Consistent. Implementation of the project would promote multi-modal transportation by increasing the efficiency of bicycle transportation surrounding the intersection and facilitate an efficient flow for increased travel demand
Measure T-1.1- Continue build-out (goal of 25 percent build-out), to the extent feasible, of the Pedestrian and Bicycle Master Plan by 2020.	Consistent. Consistent. Implementation of the project would create bicycle-friendly connections to the bicycle paths set forth in the Union City Bicycle Master Plan.

Source: City of Hayward, 2014; City of Union City, 2012; Circlepoint, 2019

Therefore, based on the above, the project would be consistent with the Hayward and Union City’s CAP and General Plan policies and would not conflict with a plan or policy developed to reduce GHG emissions. Therefore, no impact would occur.

3.2.8 HAZARDS AND HAZARDOUS MATERIALS

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?				
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CEQA SIGNIFICANCE DETERMINATIONS FOR HAZARDS AND HAZARDOUS MATERIALS

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Less Than Significant. Project construction would require vehicles trips to deliver materials and remove waste products or excavated soil. During construction, ground disturbing activities could expose construction workers to these soil contaminants, which would pose a health risk. Adherence to Measure HAZ-1 would avoid this potentially adverse effect by requiring the preparation of a PSI and Measure HAZ-3 would require a Site Safety Plan. These are standard Caltrans design features required for all projects. With adherence to Caltrans requirements, project construction would not create a significant hazard to the public or the environment through the transport, use, or disposal of, hazardous materials.

As a transportation infrastructure project, project operation would not directly involve the routine use, disposal, or transportation of hazardous materials and would not have a significant impact on the public or the environment. This impact would be less than significant.

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Less Than Significant. An environmental database search found no evidence of previous spills or widespread contamination on the project site. However, excavation could encounter contaminated groundwater, as described in Table 3.2.8-1 below. Construction would entail large areas of grading, installation of road surfaces, drainage improvements and cut/fill embankments. Project construction would also require vehicles trips to deliver materials and remove waste products or excavated soil. Excavation and grading could encounter residual contamination associated with previous residential, commercial, and agricultural uses on the project site. There is the potential for the release of hazardous materials into the environment. Adherence to Measure HAZ-1, Measure HAZ-2, and Measure HAZ-3 would require additional site testing prior to construction, development of a site safety plan, and retention of contaminated groundwater in temporary on-site tanks to avoid exposure of construction workers or further spread of contamination. These are standard Caltrans design features required for all projects.

Table 3.2.8-1 Hazardous Materials Release Sites of Concern

Site No.	Site Name and Location	Summary of Potential Impacts
02	Conway Western Express, 2200 Claremont Court	In 1987, a release of diesel from a leaking fuel line was reported at the Conway Western Express site. This site is on the southwest side of the I-880/Industrial Parkway West interchange, adjacent to proposed work areas for all Build Alternatives. Dual-phase extraction wells reportedly removed approximately 5,500 gallons of diesel fuel. In 1994, another release of diesel was reported during the removal of seven USTs along the building. Further extraction activities were performed, and the case was closed when it was determined that residual petroleum hydrocarbons did not pose a significant risk to public health. Groundwater monitoring activities in 2012 detected residual concentrations of petroleum hydrocarbons. Residual soil and groundwater contamination from the release site could be encountered during construction of the Build Alternatives.
04	Calaveras Cement, 30101 Industrial Parkway	In 1988, a release of petroleum from a leaking concrete septic vault was reported at the Calaveras Cement site. The case was closed because it did not appear that further monitoring, investigation, or remedial actions were necessary to protect the beneficial uses of the groundwater basin. Based on the most recent groundwater monitoring report, residual concentrations of diesel were detected in groundwater samples collected near the project site. Therefore, residual groundwater contamination could be encountered during construction of the Build Alternatives.
05	Chevron #9-3142, 30151 Industrial Parkway Southwest	In 1994, a release of petroleum from leaking USTs was reported at the Chevron #9. The case was closed after site investigation and remediation activities were completed, and it was determined residual petroleum hydrocarbons did not pose a significant risk. Based on the most recent groundwater monitoring report, residual concentrations of petroleum were detected in groundwater samples collected adjacent to the project site. Therefore, residual groundwater contamination from the release site could potentially be encountered during construction of the Build Alternatives.

Site No.	Site Name and Location	Summary of Potential Impacts
06	Mobil 10-LD2/BP 11269, 2492 Whipple Road	In 1998, a release of petroleum from leaking USTs was reported at the Mobil 10 site. Based on the most recent groundwater monitoring activities, a petroleum hydrocarbon plume extends north from the release site and crosses the project site at Whipple Road. Therefore, groundwater contamination from the release site could be encountered during construction of the Build Alternatives.
07	Crescent Truck Lines, 2480 Whipple Road	In 1987, a release of petroleum from leaking USTs was reported at the Crescent Truck Lines site. A release of chlorinated solvents from an unknown source has also been reported on the site. Based on recent groundwater monitoring activities, the petroleum hydrocarbon plume extends north from the release site toward the Mobil 10-LD2/BP 11269 site. The chlorinated solvent plume extends north from the release site and crosses the project site. Therefore, groundwater contamination from the release site could be encountered during construction of the Build Alternatives.

Source: *Phase I Initial Site Assessment*

Other potentially hazardous materials may be present in building materials, such as thermal system insulation, surfacing materials, and asphalt and vinyl flooring materials installed prior to 1981 that may contain asbestos. Lead compounds may also be present in interior or exterior paints regardless of construction date. Lead and asbestos are state-recognized carcinogens, and lead is a reproductive toxicant. Bridges and wall structures could contain asbestos materials and may have surfaces coated with lead-based paint. Demolition or modification of these structures could release lead particles and asbestos fibers (if present) into the environment. This presents a potential health risk to construction workers. Measure HAZ-4 would avoid this potentially adverse effect by requiring preconstruction survey of all structures that would be removed or modified, including bridges, under the Build Alternatives. Any hazardous building materials identified would be removed prior to construction. This is a standard Caltrans design feature required for all projects.

During operation, automobile traffic could result in collisions that result in the accidental release of substances such as fuel, lubricants, or hazardous freight. In order to account for these potential hazards, the project would be designed and engineered per standard Caltrans engineering requirements for roadway slope, curvature, speeds, storm water treatment, lane orientation, and other standard roadway design criteria. Compliance with

these standards would minimize the potential for hazardous material or waste release under accident conditions. The project would be designed and operated consistent with all applicable standards and regulations for safety and would not present a unique or above-average risk for accidents involving hazardous materials. This impact would be less than significant.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Less than Significant. The closest school to the project site is Ruus Elementary School, approximately 0.4 mile away. As a transportation network, the project would not result in the use or frequent handling of hazardous materials. Due to the distance between the project site and the nearest school, it is unlikely that the project would result in impacts associated with hazardous emissions or hazardous materials. Therefore, this impact would be less than significant.

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

No Impact. The project site is not included on a list of hazardous materials sites compiled pursuant to Government Code Section 6596.5 and, as a result would not create a significant hazard to the public or the environment. Therefore, no impact would occur.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?

And

f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?

No Impact. The project site is approximately 6 miles south of the Hayward Executive Airport. There are no other airports or private airstrips in the project area. The project is not within the Hayward Executive Airport Influence Area, nor would the presence of the project result in a safety hazard for people residing or working within the project area. Therefore, no impact would occur.

g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Less than Significant. As discussed in Section 2.1.4, Utilities and Public Services, the closest fire station to the project site is Hayward Fire Department Station 4, approximately 1 mile to the northwest. California Highway Patrol and Hayward Police Department offices are located approximately 800 feet east from the I-880/Whipple Road-Industrial Parkway Southwest Interchange. Although no property owned or used by emergency service providers would be acquired, construction activities would have the potential to temporarily disrupt roadway access, potentially affecting emergency access. Measure ULT-2 would require emergency responders be notified prior to temporary road closures or detours. This is a standard Caltrans design feature applicable to all projects. With adherence to Caltrans' requirements, this impact would be less than significant.

h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

No Impact. The project site is not located within a Fire Hazard Severity Zone (FHSZ), demonstrating a low susceptibility to fire hazards. Construction and operation of the project would represent little to no threat of exposing people or structures to fire hazards. Therefore, no impact would occur.

3.2.9 HYDROLOGY AND WATER QUALITY

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
j) Inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CEQA SIGNIFICANCE DETERMINATIONS FOR HYDROLOGY AND WATER QUALITY

a) Violate any water quality standards or waste discharge requirements?

Less than Significant. Construction of the Build Alternatives would involve ground disturbing activities such as excavation, trenching, grading, demolition, and vegetation removal. The realignment of Ward Creek and other construction activities could result in runoff that contains sediment and other pollutants. Sources of sediment include uncovered or improperly covered stockpiles, unstable slopes, bare soil, construction staging areas, and construction equipment not properly maintained or cleaned. Polluted runoff could degrade water quality if not properly controlled. This would be a potentially significant impact.

Potential effects to water quality would be minimized with adherence to standard guidelines and procedures outlined in the 2016 Caltrans Statewide SWMP (Measure WQ-1). Measure WQ-1 describes required construction erosion and sediment control BMPs, storm monitoring, dust control, waste management and materials pollution control, and maintenance activities that take place during construction and would minimize temporary effects. Measure WQ-1 also describes that a SWPPP is required, which would include protective measures and guidance to prevent and minimize storm water and non-storm water discharges. All of the required actions and report preparation described under Measure WQ-1 are required through Caltrans’ standard procedures and/or state regulations. Therefore, these measures are not considered to be mitigation under CEQA.

Adherence to Measure WQ-2 would minimize construction-period effects through Design Pollution Prevention BMPs, which would be employed to minimize hydromodification impacts. The BMPs include attenuation of peak stormwater flow through passive or active measures to ensure peak flow volumes do not increase. BMPs would also include revegetation of all graded and disturbed areas. Similar to Measure WQ-1, the items under Measure WQ-2 are required by Caltrans on all projects. Measures WQ-1 and WQ-2 are discussed further in Section 2.2.2, Water Quality and Storm Water Runoff.

Construction vehicles would be stored, refueled, and repaired/maintained at the project site during the construction period. This presents a risk of accidental spills or releases of fuels, oils, or other potentially toxic materials. An accidental release could pose a threat to water quality if contaminants enter storm drains, open channels, or surface water receiving bodies (i.e., Ward Creek and Old Alameda Creek). However, adherence to Measure WQ-1 would minimize the risk that accidental spills or releases could affect water quality by ensuring waste management and materials pollution measures are implemented. Therefore, the project would not violate any water quality standards or waste discharge requirements. This impact would be less than significant.

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

Less than Significant. As discussed in Section 2.2.2, Water Quality and Storm Water Runoff, the project would not deplete groundwater levels. Operation of the project would require very little water and would not be directly connected to groundwater sources. The addition of pervious surfaces in the project area would not substantially interfere with groundwater recharge, as the project area is predominately developed with impervious surfaces making percolation of stormwater infeasible under existing conditions.

Although groundwater conditions will be verified during the design phase, groundwater is expected to be encountered at elevation ranges between approximately 1 foot below sea level and 5 feet above sea level. Given this, new subgrade construction would likely require dewatering, such as pier/pile installations and reconfiguring Ward Creek. Construction activities that contact the groundwater table or require dewatering could create loose soils and introduce pollutants to the groundwater but would not have the potential to result in groundwater depletion. This impact would be less than significant.

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?

And

d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

Less than Significant. The Build Alternatives would have only minor effects on the existing drainage patterns for Ward Creek, Line D, and its southern branch tributary channel. The most substantial change would occur to Ward Creek, which would be realigned on the southeast side of the I-880/Industrial Parkway West Interchange. The new, slightly curved channel would likely require biotechnical and structural bank stabilization measures to protect it from erosion and siltation.

Implementation of general erosion control measures would be required in addition to project revegetation, in accordance with the BMPs outlined in the SWPPP. The realigned section of Ward Creek is expected to transition to the existing channel alignment upstream of the Line D confluence and should not require re-grading or realignment of the existing confluence. The existing Ward Creek cross-section and flood conveyance would be maintained or slightly expanded. This realignment would therefore not affect the rate or amount of surface runoff in a manner which would result in flooding. Therefore, these impacts would be less than significant.

e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

Less than Significant. The addition of impervious areas such as the widened bridge structure at the I-880/Industrial Parkway West Interchange and the addition of new on- and off-ramps would proportionately increase the quantity of polluted runoff and contaminant loading. Polluted runoff could include petrochemical constituents and heavy metals with the potential to impact water quality in Ward Creek. Further, impervious areas prevent runoff from naturally dispersing and infiltrating into the ground. This results in an increased concentration of water flow in stormwater conveyance channels, which could increase erosion and impact water quality.

As described in Section 2.2.2, Water Quality and Stormwater Runoff, the existing impervious surface coverage for the project ranges from 15.28 to 19.1 acres, depending on the Build Alternative selected. Under the Build Alternatives, net new impervious surface would range from 1.9 to 2.9 acres. For the entire Ward Creek Watershed, this represents a 0.02 to 0.03 percent increase in impervious surfaces. This slight increase within the watershed would not reasonably contribute to notable increases in stormwater pollutants from automotive-based contaminants. The project would still comply with all statutory requirements to ensure that water quality is not adversely affected. Because all Build Alternatives would create more than 1 acre of new impervious surface, a Section 401 Permit would be required, and because of the existing impaired water quality in Ward Creek, this would be a potentially significant impact. The project would be required to comply with state water quality standards. Given this, pollution prevention measures and post-construction treatment BMPs would be included (Measure WQ-2).

Adherence to state water quality standards as implemented by Caltrans would minimize construction-period effects through Design Pollution Prevention BMPs, which would be employed to minimize hydromodification impacts. The BMPs include attenuation of peak stormwater flow through passive or active measures to ensure peak flow volumes do not increase. BMPs would also include revegetation of all graded and disturbed areas.

Measure WQ-4 describes required post-construction treatment BMPs, in compliance with the 2016 Caltrans Statewide SWMP, that would filter and retain potentially contaminated stormwater runoff through two categories of BMPs: infiltration-based and capture and treat. Infiltration-based BMPs consist of biofiltration and bioretention filtration methods, as well as using earthen media filters and wet basins to remove soluble pollutants. Capture-and-treatment BMPs include multi-chamber treatment trains and media filters to treat stormwater in small sites that are highly urbanized and may be highly polluted. Therefore, secondary effects due to erosion and downstream impacts to water quality would be avoided.

In addition to the measures previously discussed, maintenance BMPs are preventative measures implemented to ensure that minimal pollutants are discharged to surface waters via Caltrans' storm water drainage systems. Maintenance activities involve the use of a variety of products. Under normal, intended conditions of use, these materials are not considered pollutants of concern. However, if these products are used, stored, spilled, or disposed of in a way that may cause them to contact storm water or enter storm water drainage systems, they may become a concern for water quality. Maintenance activities are performed in dry weather to minimize impacts to water quality; however, conditions may

exist which require these activities be conducted in wet weather. Maintenance BMPs include soil stabilization, conveyance controls, sediment control, wind erosion control, and materials pollution control. These BMPs are outlined in full in the Caltrans Storm Water Quality Handbook, Maintenance Staff Guide.

With adherence to standard procedures and regulation described above, the project would not increase runoff water such that the capacity of existing or planned stormwater drainage systems would be exceeded or provide substantial additional sources of polluted runoff. This impact would be less than significant.

f) Otherwise substantially degrade water quality?

Less than Significant. The increased impervious surface area for the Build Alternatives would generate minor increases in stormwater peak flow rates and runoff volumes. The amount of dissolved contaminants, automotive oil, and grease contained in stormwater runoff would also increase. However, increases in loading rates are proportional to the percent increase in impervious area within the watershed. As previously discussed, the Ward Creek Watershed covers 14.9 square miles, and the Build Alternatives would increase the amount of impervious area by 0.02 to 0.03 percent within the watershed. Therefore, increases in stormwater runoff volumes and contaminants would increase by 0.02 to 0.03 percent. Adherence to standard procedures and regulation described in Measures WQ-1 and WQ-2 would avoid adverse effects to water quality from oil, grease, and other chemical pollutants.

Additionally, the Build Alternatives would adhere to Caltrans' guidelines on the application and use of chlorpyrifos-based pesticides for control of weeds and invasive plants for maintenance of vegetated areas. Diazinon or DDT would not be used. The Caltrans Vegetation Control Policy mandates preparation of a Vegetation Control Plan, which regulates the use and application of pesticides by trained personnel. The policy requires the use of the least-toxic chemical that is available and effective to control the target plant species. Caltrans maintains a current listing of state-approved pesticides and updates it as necessary as research and technical practice evolve. Therefore, this impact would be less than significant.

g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

No Impact. The project is a transportation infrastructure project and does not propose housing. Therefore, there would be no impact.

h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?

Less than Significant. The project would encroach on the 100-year base floodplain on the east side of I-880 where Ward Creek would be realigned, as well as at the bridged Line A crossing. However, along Ward Creek, the existing channel cross-section and flood conveyance would be maintained or slightly expanded, while offset eastward. The net impact of the Industrial Parkway overcrossing structure and the northbound I-880 on-ramp on the Ward Creek floodplain would be positive, resulting in flood flow encroachment reduction and less obstruction within the floodplain.

The construction of the proposed northbound I-880 off-ramp to Industrial Parkway West would create an encroachment of the existing FEMA floodplain on Ward Creek. The extent of the encroachment and potential reduction in the channel cross-section that conveys the one percent annual chance flood would be compensated by excavation of an equivalent channel cross-section to the east of the existing channel. Therefore, impacts to the 100-year flood hazard area would be less than significant.

i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

Less than Significant. As discussed above, the project would not alter the existing drainage patterns of the site in a manner that would result in flooding. The Line A channel is strongly leveed along its entire extent, and in addition to the flows from the Ward Creek and Line D watersheds, it funnels urban runoff from largely commercial-industrial areas to the north and south. Only the upstream segment of Line A would be affected by the I-880/Industrial Parkway West Interchange improvements, including the widening of southbound I-880 and its bridged crossing of Line A. Up to 3.12 acres of potential Waters of the U.S. would be temporarily affected by the Build Alternatives. However, the realignment of Ward Creek would maintain the same cross-section as the existing channel. Therefore, the existing acreage of Waters of the U.S. would be preserved and the realignment would not expose people or structures to a significant risk involving flooding.

Some overtopping (0.19 feet) of the eastern maintenance road and levee was indicated in the ACFCD's modeling, while the FIRM documentation showed that the 1 percent annual chance flood would be contained. Project modeling determined that if implemented, the project would potentially be affected by the 1 percent annual chance flood. Levee overtopping, however minimal, would influence flood elevations in the eastern floodplain. This would be a potentially significant impact and would require further hydraulic analysis. Measure HYDRO-1 would require further hydraulic analysis to take place to confirm the existing channel condition and overtopping level, if any, due to project construction. This impact would be less than significant.

j) Inundation by seiche, tsunami, or mudflow?

No Impact. Tsunamis are large sea waves caused by earthquakes in the ocean, landslides, or volcanic eruptions. Alternatively, a seiche is defined as a wave oscillation on the surface of water in an enclosed basin, such as a lake, which can occur as a result of seismic activity. Due to the significant distance between the project site and the San Francisco Bay (about 1.5 miles), there is no potential for tsunamis or seiches to occur within the study area. The project site is also located on a relatively flat terrain and there are no significant slopes in the vicinity. Therefore, the risk of landslide or mudflow is considered low to very low. Therefore, there would be no impact.

3.2.10 LAND USE AND PLANNING

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CEQA SIGNIFICANCE DETERMINATIONS FOR LAND USE AND PLANNING

a) Physically divide an established community?

No Impact. The project includes modifying existing transportation infrastructure within the project area to improve overall efficiency of the local transportation network. Implementation of the project also features pedestrian and bicycle safety improvements increasing mobility within the project area. Construction and operation of the project would not physically divide an established community. Therefore, no impact would occur.

b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

No Impact. As discussed in Section 2.1.1, Land Use, the land use study area surrounding the I-880/Industrial Parkway West Interchange consists of flat terrain developed with urban, industrial, and commercial land uses interspersed with residential neighborhoods.

The Hayward and Union City General Plans identify the I-880 Industrial Parkway West and the I-880 Whipple Road-Industrial Parkway Southwest interchanges as areas that could benefit from improved circulation and enhanced mobility. MTC, as the regional transportation planning agency in the San Francisco Bay Area, has also included the project in the RTP. Therefore, the project changes are accounted for in both local General Plans and overarching, regional plans. Moreover, implementation of the project would not require or result in changes to existing land uses or zoning in the project area. Although some property acquisition would be required, such acquisition would not conflict with local plans (see Section 2.1.3, Community Impacts). The project would not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction of the project. Therefore, no impact would occur.

c) Conflict with any applicable habitat conservation plan or natural community conservation plan?

No Impact. The project site is not within the boundaries of any habitat conservation plan or natural community conservation plan.⁴¹ Therefore, the project would not conflict with any applicable habitat conservation plan or natural community service plan. Therefore, no impact would occur.

⁴¹ As indicated in Section 3.2.4, Biological Resources, a habitat conservation plan, and a conservation strategy that encompass the project area are currently being developed.

Alameda County. 2019. Land Use Planning. Available online at: <https://www.acgov.org/sustain/what/landuse/>; last accessed October 2019.

3.2.11 MINERAL RESOURCES

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CEQA SIGNIFICANCE DETERMINATIONS FOR MINERAL RESOURCES

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

And

b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?

No Impact. As discussed in Section 2.2.3 Geology/Soils/Seismic/Topography, the project area is within an MRZ-1 zone on the Mineral Land Classification Map, managed by the Department of Conservation. This zone is characterized as having no significant mineral deposits present or little likelihood for the presence of mineral deposits. Given this, implementation of the project would not result in the loss of availability of a known mineral resource or a locally-important mineral resources recovery site. Therefore, no impact would occur.

3.2.12 NOISE

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CEQA SIGNIFICANCE DETERMINATIONS FOR NOISE

Information in this section is based on the *Noise Study Report* prepared for the project.

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

And

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

And

d) The project would result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

Less than Significant. As presented and discussed in Chapter 2, the project would have a less than significant impact related to these three resource areas. This rationale is revisited below.

As described in Chapter 2.2, Physical Environment, construction phases would include stream diversion; concrete pavement construction, excavation, and grading; construction of bridge structures, culverts and drainage systems, retaining walls, guardrail and concrete barriers; miscellaneous concrete work; relocation of utilities; paving; and installation of overhead signs and lighting. Construction noise would primarily result from the operation of heavy construction equipment and arrival and departure of heavy-duty trucks. The highest maximum instantaneous noise levels would result from paving and demolition equipment. Cast-in-drilled-hole piles are expected to be used for structures immediately adjacent to Ward Creek and Whipple undercrossing structures. Overhead signs would be supported on cast-in-drilled-hole piles in the median of I-880. Some areas of the project would require only re-striping, and some areas would include new concrete median barriers.

For the purposes of the Noise Study Report prepared for the project, general roadway construction noise levels were based on typical equipment and activity levels related to roadway construction activities.⁴²

The maximum projected sound level at 50 feet from sensitive receptors would be 90 dBA. This exceeds the maximum allowed threshold of 86 dBA. However, construction noise for all receptors would be short-term and intermittent.

Standard Caltrans measures that are used for all projects include that construction noise shall not exceed a maximum sound level of 86 dBA at 50 feet from job site activities between the hours of 9:00 p.m. to 6:00 a.m. The following standard measures will also be implemented to minimize or reduce the potential for noise impacts from project construction:

- Limit paving and demolition activities to 7:00 a.m. to 7:00 p.m., where feasible.
- Equip all internal combustion engine driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment.
- Prohibit unnecessary idling (i.e., greater than 5 minutes in duration) of internal combustion engines within 100 feet of residences.

⁴² Reference noise levels and activity usage factors were based on the 2006 FHWA Roadway Construction Noise Model

- Avoid staging of construction equipment within 200 feet of residences and locate all stationary noise-generating construction equipment, such as air compressors, portable power generators, or self-powered lighting systems as far as practical from noise-sensitive receptors.
- Utilize “quiet” air compressors and other “quiet” equipment where such technology exists.

With implementation of best management noise control measures, constructed related noise would be reduced and this impact would be less than significant.

The FHWA Traffic Noise Model version 2.5 (TNM 2.5) was used to provide representative predictions of future traffic noise levels at sensitive land uses in the project area, assuming the worst-case (loudest) traffic speeds and maximum lane capacities. At each modeled receptor, predictions were made for future worst-case traffic noise levels with and without the project, and for the maximum noise level change with respect to existing conditions. Traffic noise impacts occur at a noise-sensitive land use if predicted design year noise levels exceed or approach the NAC of 67 A-weighted dB equivalent sound level (dBA $L_{eq[h]}$) or if predicted design year noise levels increase substantially (by 12 dBA or more) over existing levels.

The project is expected to increase noise levels over existing conditions by 0 to 2 dBA at most receivers. Predicted noise levels at up to 30 residential receptors would approach or exceed the NAC of 67 dBA in 2045 with the project. As noise impacts are expected to occur at these receiver locations, noise abatement was considered for the project.

Noise abatement in the form of sound walls was considered in the *Noise Study Report* and the NADR prepared for the project. Three existing sound walls were evaluated, ranging in height between 12 and 16 feet. These existing sound walls are located in the state right-of-way, which is the most effective location to block the line of sight between the outdoor use areas and freeway traffic and to reduce noise. As described in detail in Section 2.2.7, Noise, the existing soundwalks will reduce operational noise to an acceptable level, and no new sound walls are recommended.

A change of 2 dBA or less is not generally considered a perceptible or audible change in noise. Though the future condition with the project (2045 with Project) would approach or exceed the NAC of 67 dBA, future noise levels with the no-project condition (2045 No Project) are also expected to exceed this threshold as increased traffic on existing roads would increase NAC in both scenarios. Further, the standard Caltrans measures references above would reduce construction period noise below 86 dBA. Therefore, this impact would be less than significant.

b) Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Less Than Significant. Construction often generates perceptible vibration levels and levels that could affect nearby structures when heavy equipment or impact tools (e.g. jackhammers, pile drivers, hoe rams) are used in the vicinity of nearby sensitive land uses. Building damage generally falls into three categories. Cosmetic damage (also known as threshold damage) is defined as hairline cracking in plaster, the opening of old cracks, the loosening of paint or the dislodging of loose objects. Minor damage is defined as hairline cracking in masonry or the loosening of plaster. Major structural damage is defined as wide cracking or the shifting of foundation or bearing walls.

Project construction activities, such as the use of jackhammers, rock drills and other high-power or vibratory tools, and rolling stock equipment (tracked vehicles, compactors, etc.) may generate substantial vibration in the immediate vicinity of project construction. Construction activities within the project site include constructing pavement, curb and sidewalk, grading, constructing retaining walls and bridge foundation, install overhead signs, roadway signs and drainage systems, realign creek channel. Activities within the temporary impact footprint include temporary grading to construct retaining wall foundation and bridge foundation, potential construction access and roadway striping.

Cast-in-drilled-hole concrete pile foundations are proposed for structures at the I-880/Industrial Parkway West and the I-880/Whipple Road-Industrial Parkway Southwest interchanges for all three Build Alternatives. These activities have the potential to generate substantial groundborne vibration and groundborne noise for all receptors. Standard Caltrans best management practices will be applied to reduce groundborne vibration/noise levels during construction so that construction activities impact would be less than significant.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

And

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

No Impact. The Hayward Executive Airport provides both public and private facilities and services. The project site is located approximately 6 miles south of the Hayward Executive Airport. The project site does not lie within the airport's area of influence (AIA); the nearest

border of the AIA to the project site lies approximately 0.75 mile northeast. Therefore, the project would not result in a safety hazard or in excessive noise levels for people residing or working in the project site. Therefore, no impact would occur.

3.2.13 POPULATION AND HOUSING

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CEQA SIGNIFICANCE DETERMINATIONS FOR POPULATION AND HOUSING

a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

No Impact. The project would not include new homes or businesses, and in turn, would not directly increase population growth in the project area. While implementation of the project would improve traffic movement throughout the project area, it would not increase the capacity of the I-880 or the local roadway network. Given this, the project would not induce substantial population growth. Therefore, no impact would occur.

b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

And

c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

No Impact. As described in Section 2.1.3, Community Impacts, implementation of the project would require several acquisitions, varying in number by Build Alternative. Although all Build Alternatives would require some acquisition, only Build Alternative 1 and Build Alternative 3 have the potential to result in relocation of a business. None of the Build Alternatives would displace housing or necessitate the construction of housing elsewhere. Therefore, no impact would occur.

3.2.14 PUBLIC SERVICES

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CEQA SIGNIFICANCE DETERMINATIONS FOR PUBLIC SERVICES

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

Fire Protection and Police Protection

Less than Significant. The closest fire station to the project site is Hayward Fire Department Station 4, approximately 1 mile to the northwest. California Highway Patrol and Hayward Police Department offices are located approximately 800 feet east from the I-880/Whipple Road-Industrial Parkway Southwest Interchange. Although no property owned or used by

emergency service providers would be acquired, construction activities would have the potential to temporarily disrupt roadway access within the project limits, potentially affecting emergency response times. Adherence to Measure UTL-2 would ensure that emergency service providers would be notified in advance of any roadway closure or change in local access, as a part of the TMP described in Measure TRA-1. This would allow emergency service providers to be aware of detours in advance and plan alternate routes where needed. Both the emergency service notifications and TMP requirement are standard Caltrans design features required of all projects. Therefore, this impact would be less than significant.

Schools

No Impact. As discussed in Section 3.2.14, Population and Housing, the project does not have the potential to directly or indirectly induce population growth in the project area. Given this, implementation of the project would not result in increased demand for schools or result in impacts related to new or expanded school facilities. Therefore, no impact would occur.

Parks and Other Public Facilities

No Impact. Open space and other public facilities such as libraries and community centers are typically provided to serve the residents of their respective jurisdictions. As discussed above, the project would not directly or indirectly induce population growth. Given this, the project would not increase demand for open space or other public facilities. Therefore, no impact would occur.

3.2.15 RECREATION

	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CEQA SIGNIFICANCE DETERMINATIONS FOR RECREATION

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

And

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

No Impact. As discussed above, the project would not include residential, recreational, or business uses and does not have the potential to induce population growth in the project area. Given this, implementation of the project would not increase the use of existing neighborhood and regional parks such that substantial physical deterioration or expansion would occur. Therefore, no impact would occur.

3.2.16 TRANSPORTATION/TRAFFIC

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CEQA SIGNIFICANCE DETERMINATIONS FOR TRANSPORTATION/TRAFFIC

a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

No Impact. The proposed interchange improvement project is sponsored by Alameda CTC and Caltrans as a project identified to improve local business access along Whipple Road, enhance user safety and relieve freeway and interchange congestion. Therefore, the project would have no impact.

b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

No Impact. Alameda CTC has “grandfathered” the LOS F for the Congestion Management Program along key roadway segments including the portion of I-880 in the northbound

direction between Alvarado-Niles Boulevard and State Route 92. The project would have no impact, as the freeway LOS would not be altered within the study area as a result of project implementation.

c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

No Impact. Implementation of the project would have no effect on air traffic patterns leading to a safety risk as the proposed project would not include any structures built to a height which would affect the operation of air traffic patterns. Therefore, the project would have no impact.

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

No Impact. The proposed project would not increase hazards due to a design feature. Common design features to the Build Alternatives would include upgrades such as new on- and off- ramps, roadway widening, a new bridge structure, and intersection modifications that have a similar appearance to structures and multi-lane roadways in the existing area. None of the additional features mentioned would increase the risk of hazards in the existing area. Therefore, the project would have no impact.

e) Result in inadequate emergency access?

Less than Significant. Long term impacts of the proposed project on emergency access would generally be positive because of reductions in traffic delays and congestion at the study intersections. Temporary lane closures as a result of construction activity would be required. These actions could result in short-term temporary impacts to emergency access, which would be minimized by the implementation of TRA-1. Therefore, this impact would be less than significant.

As required by Measure TRA-1, a TMP will be prepared to ensure efficient movement of local and regional traffic during construction. The TMP will provide for public outreach to inform community agencies, such as the fire department, and the public of the times and locations of upcoming construction, signage in and approaching the project area, and incident management for traffic control in the vicinity of construction activities. Creation and implementation of a TMP is a standard requirement for all Caltrans projects. This impact would be less than significant.

f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

No Impact. The proposed project would improve pedestrian and bicycle access by constructing or improving existing pedestrian and bicycle paths and crosswalks. These improvements are consistent with the current City of Hayward General Plan and Bicycle and Pedestrian Master Plan. Therefore, the project would have no impact.

3.2.17 TRIBAL CULTURAL RESOURCES

<p>Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:</p>	<p>Significant and Unavoidable Impact</p>	<p>Less Than Significant with Mitigation Incorporated</p>	<p>Less Than Significant Impact</p>	<p>No Impact</p>
<p>a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or</p>	<p><input type="checkbox"/></p>	<p><input type="checkbox"/></p>	<p><input type="checkbox"/></p>	<p><input checked="" type="checkbox"/></p>
<p>b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.</p>	<p><input type="checkbox"/></p>	<p><input type="checkbox"/></p>	<p><input type="checkbox"/></p>	<p><input checked="" type="checkbox"/></p>

CEQA SIGNIFICANCE DETERMINATIONS FOR TRIBAL CULTURAL RESOURCES

Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or

No Impact. Please refer to the historic resource discussion under Section 3.2.5, Cultural Resources, above.

b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

No impact. As discussed in Section 2.1.7, Cultural Resources and Tribal Cultural Resources, a Sacred Lands File Search was conducted on behalf of the project by the NAHC in December 2018. Although the NAHC determined that no tribal cultural resources have been previously identified within the APE, a list of interested Native American tribal representatives with traditional lands or cultural places within Alameda County was included in the NAHC response. In January 2019 certified letters were sent to all Native American contacts provided by the NAHC describing the project, providing a location map, and requesting any information and concerns the Tribes may have regarding the project or study area. All correspondence between the NAHC, Native American tribes, and Caltrans is provided in the project HPSR.

While no tribal cultural resources have been recorded in the APE, there is the possibility that unrecorded resources could be unearthed during construction. Adherence to Caltrans protocols (Project Design Feature CUL-1) would ensure that if tribal cultural resources are discovered during construction, all earth-moving activity would cease until a qualified archeologist can assess the nature and significance of the find, thus avoiding impacts to such resources. As described above, these protocols are universally applied on all Caltrans. With implementation of these measures and because encountering tribal cultural resources during construction is unanticipated, there would be no impact on tribal cultural resources.

Once construction is complete, the project would not entail earth-moving activities with the potential to damage or discover previously unrecorded tribal cultural resources. Given this, the project would not endanger the integrity of tribal cultural resources long term. There would be no impact.

3.2.18 UTILITIES AND SERVICE SYSTEMS

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CEQA SIGNIFICANCE DETERMINATIONS FOR UTILITIES AND SERVICE SYSTEMS

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

And

b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

No Impact. Operation of the project would not generate wastewater. Given this, wastewater treatment requirements are not applicable to the project and expansion of water or wastewater treatment facilities would not occur.

As a roadway project, operation would not include the regular use of water or recycled water services other than minor use for landscaping. Although water may be used intermittently at the project site for maintenance purposes such as street sweeping, this would not require water or water services to the extent that new or expanded treatment facilities would be required. Similarly, operation of the project would not generate wastewater, as no habitable structures or other facilities such as restrooms are proposed. Therefore, this would result in no impact.

c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Less than Significant. The project would include a realignment of an approximately 1,000-foot reach of Ward Creek (ACFCD Line B) to accommodate a new northbound I-880 off-ramp at Industrial Parkway West. Because the realignment would maintain, or slightly expand, the existing channel cross-section, the existing flood conveyance would remain. A temporary culvert would be established through the construction limits to maintain fish passage and limited water flows during temporary creek diversion. The Ward Creek realignment would not cause significant environmental effects. Other improvements related to stormwater conveyance would include construction of new drainage inlets and channels along on- and off-ramps and would not have the potential to result in environmental impacts. Therefore, this impact would be less than significant.

d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

No Impact. Project operation would not require the regular use of potable or non-potable water, and thus would not increase water demand or generate wastewater. Therefore, this would result in no impact.

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

No Impact. As discussed above, operation of the project would not generate wastewater. Given this, implementation of the project would not result in an increased usage of wastewater treatment facilities in the project area. Therefore, this would result in no impact.

f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

And

g) Comply with federal, state, and local statutes and regulations related to solid waste?

No Impact. As a transportation improvement project, the project would not require landfill capacity or solid waste disposal. Operation of the project would not generate solid waste and municipal waste collection would not be needed. Based on the foregoing, no impact would occur.

3.2.19 WILDFIRE

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Is the project located in or near state responsibility areas or lands classified as very high fire hazard severity zones?	<input type="checkbox"/> Yes		<input checked="" type="checkbox"/> No	
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose Project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

The California Department of Forestry and Fire Protection (CAL FIRE) identifies fire hazard based on relevant factors such as fuels, terrain, and weather. The project site is not located within a State Responsibility area, nor is it near land classified as a very high fire hazard severity zone.⁴³ Given the above, the project would not cause or exacerbate wildfires, and no impacts would occur.

⁴³ California Department of Forestry and Fire Protection, 2007. Alameda County Fire Hazard Severity Zones in SRA. Available:
https://osfm.fire.ca.gov/media/7271/fhszs_map1.pdf.

3.2.20 MANDATORY FINDINGS OF SIGNIFICANCE

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

CEQA SIGNIFICANCE DETERMINATIONS FOR MANDATORY FINDINGS OF SIGNIFICANCE

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

Less Than Significant. The project site is in a developed area and contains no sensitive habitats, wildlife corridors, or anadromous streams for migrating salmonids. Project construction could impact the Alameda song sparrow and saltmarsh common yellowthroat, while sedimentation, clearing and grubbing, and earthwork from construction could impact the western pond turtle. The project would require realignment of Ward Creek and would result in minor loss of non-jurisdictional natural areas. The project would not result in impacts to biological resources based on the project setting in an urban context and adherence to standard Caltrans requirements and design measures which would ensure natural areas are restored on-site or compensated for off-site. These impacts would be less than significant.

Earthmoving and ground disturbing activities could disturb archaeological cultural or paleontological resources at the project site. However, this is not anticipated based on surveys done for this project. Caltrans does not anticipate this project will eliminate important examples of the major periods of California history or prehistory.

b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

Less than Significant. The project would involve improvements to existing roadways, having potential impacts related to, air quality, biological resources, geology and soils, public services, and utilities and service systems. Past and foreseeable future developments within Hayward and Union City consist of commercial and residential projects as well as improvements to the transportation network. Development of the study area has been discussed in applicable plans and regulatory documents locally and within the region. The project would be consistent with applicable goals, policies, and objectives of each jurisdiction's General Plan. Therefore, with continued adherence to Caltrans standard design requirements and project design features, these impacts would not be cumulatively considerable and would be less than significant.

c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Less than Significant. The project would not result in impacts associated with geology and soils, hydrology and water quality or hazards with the potential to result in an adverse effect on human beings, directly or indirectly. Implementation of the project would require acquisition of private property that may result in commercial relocations or displacements. However, none of the Build Alternatives would result in the displacement of any residences. With adherence to standard Caltrans design requirements and project design features identified herein, all potential impacts would be less than significant. Implementation of the project would not result in environmental effects as a result of business displacement and would not displace any residential, minority, or low income populations. Therefore, the project would not result in significant impacts that would cause substantial adverse effects on human beings, either directly or indirectly.

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3.3 CLIMATE CHANGE

Climate change refers to long-term changes in temperature, precipitation, wind patterns, and other elements of the earth's climate system. An ever-increasing body of scientific research attributes these climatological changes to GHG emissions, particularly those generated from the production and use of fossil fuels.

While climate change has been a concern for several decades, the establishment of the Intergovernmental Panel on Climate Change (IPCC) by the United Nations and World Meteorological Organization in 1988 has led to increased efforts devoted to GHG emissions reduction and climate change research and policy. These efforts are primarily concerned with the emissions of GHGs generated by human activity, including CO₂, methane (CH₄), nitrous oxide (N₂O), tetrafluoromethane, hexafluoroethane, sulfur hexafluoride (SF₆), and various hydrofluorocarbons (HFCs). CO₂ is the most abundant GHG; while it is a naturally occurring component of earth's atmosphere, fossil-fuel combustion is the main source of additional, human-generated CO₂.

Two terms are typically used when discussing how we address the impacts of climate change: "greenhouse gas mitigation" and "adaptation." GHG mitigation covers the activities and policies aimed at reducing GHG emissions to limit or "mitigate" the impacts of climate change. Adaptation, on the other hand, is concerned with planning for and responding to impacts resulting from climate change (such as adjusting transportation design standards to withstand more intense storms and higher sea levels). This analysis includes a discussion of both.

3.3.1 REGULATORY SETTING

This section outlines federal and state efforts to comprehensively reduce GHG emissions from transportation sources.

FEDERAL

To date, no national standards have been established for nationwide mobile-source GHG reduction targets, nor have any regulations or legislation been enacted specifically to address climate change and GHG emissions reduction at the project level.

NEPA (42 USC Part 4332) requires federal agencies to assess the environmental effects of their proposed actions prior to making a decision on the action or project.

FHWA recognizes the threats that extreme weather, sea-level change, and other changes in environmental conditions pose to valuable transportation infrastructure and those who depend on it. FHWA therefore supports a sustainability approach that assesses vulnerability to climate risks and incorporates resilience into planning, asset management,

project development and design, and operations and maintenance practices.⁴⁴ This approach encourages planning for sustainable highways by addressing climate risks while balancing environmental, economic, and social values—“the triple bottom line of sustainability.”⁴⁵ Program and project elements that foster sustainability and resilience also support economic vitality and global efficiency, increase safety and mobility, enhance the environment, promote energy conservation, and improve the quality of life.

Various efforts have been promulgated at the federal level to improve fuel economy and energy efficiency to address climate change and its associated effects. The most important of these was the Energy Policy and Conservation Act of 1975 (42 USC Section 6201) and Corporate Average Fuel Economy (CAFE) Standards. This act establishes fuel economy standards for on-road motor vehicles sold in the United States. Compliance with federal fuel economy standards is determined through the CAFE program based on each manufacturer’s average fuel economy for the portion of its vehicles produced for sale in the United States.

The Energy Policy Act of 2005 (109th Congress H.R.6 [2005–2006]): This act sets forth an energy research and development program covering: (1) energy efficiency; (2) renewable energy; (3) oil and gas; (4) coal; (5) the establishment of the Office of Indian Energy Policy and Programs within the Department of Energy; (6) nuclear matters and security; (7) vehicles and motor fuels, including ethanol; (8) hydrogen; (9) electricity; (10) energy tax incentives; (11) hydropower and geothermal energy; and (12) climate change technology.

The U.S. EPA in conjunction with the National Highway Traffic Safety Administration (NHTSA) is responsible for setting GHG emission standards for new cars and light-duty vehicles to significantly increase the fuel economy of all new passenger cars and light trucks sold in the United States. Fuel efficiency standards directly influence GHG emissions.

STATE

California has been innovative and proactive in addressing GHG emissions and climate change by passing multiple Senate and Assembly bills and EOs including, but not limited to, the following:

⁴⁴ U.S. Department of Transportation, 2019. *Sustainability, Resilience*. Available online at: <https://www.fhwa.dot.gov/environment/sustainability/resilience/>; last accessed: October 2019

⁴⁵ U.S. Department of Transportation, 2019. *Sustainable Highways Initiative*. Available online at: <https://www.sustainablehighways.dot.gov/overview.aspx>; last accessed: October 2019

EO S-3-05 (June 1, 2005): The goal of this EO is to reduce California’s GHG emissions to: (1) year 2000 levels by 2010, (2) year 1990 levels by 2020, and (3) 80 percent below year 1990 levels by 2050. This goal was further reinforced with the passage of Assembly Bill (AB) 32 in 2006 and Senate Bill (SB) 32 in 2016.

AB 32, Chapter 488, 2006: Núñez and Pavley, The Global Warming Solutions Act of 2006: AB 32 codified the 2020 GHG emissions reduction goals as outlined in EO S-3-05, while further mandating that the CARB create a scoping plan and implement rules to achieve “real, quantifiable, cost-effective reductions of greenhouse gases.” The Legislature also intended that the statewide GHG emissions limit continue in existence and be used to maintain and continue reductions in emissions of GHGs beyond 2020 (Health and Safety Code Section 38551[b]). The law requires CARB to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective GHG reductions.

EO S-01-07 (January 18, 2007): This order sets forth the low carbon fuel standard (LCFS) for California. Under this EO, the carbon intensity of California’s transportation fuels is to be reduced by at least 10 percent by the year 2020. CARB re-adopted the LCFS regulation in September 2015, and the changes went into effect on January 1, 2016. The program establishes a strong framework to promote the low-carbon fuel adoption necessary to achieve the governor's 2030 and 2050 GHG reduction goals. SB 375, Chapter 728, 2008, Sustainable Communities and Climate Protection: This bill requires CARB to set regional emissions reduction targets for passenger vehicles. The MPO for each region must then develop a SCS that integrates transportation, land-use, and housing policies to plan how it will achieve the emissions target for its region.

SB 391, Chapter 585, 2009, California Transportation Plan: This bill requires the state’s long-range transportation plan to identify strategies to address California’s climate change goals under AB 32.

EO B-16-12 (March 2012) orders state entities under the direction of the Governor, including ARB, the California Energy Commission, and the Public Utilities Commission, to support the rapid commercialization of zero-emission vehicles. It directs these entities to achieve various benchmarks related to zero-emission vehicles.

EO B-30-15 (April 2015) establishes an interim statewide GHG emission reduction target of 40 percent below 1990 levels by 2030 to ensure California meets its target of reducing GHG emissions to 80 percent below 1990 levels by 2050. It further orders all state agencies with jurisdiction over sources of GHG emissions to implement measures, pursuant to statutory authority, to achieve reductions of GHG emissions to meet the 2030 and 2050 GHG emissions reductions targets. It also directs CARB to update the Climate Change Scoping Plan to express the 2030 target in terms of million metric tons of carbon dioxide equivalent

(MMTCO_{2e}).⁴⁶ Finally, it requires the Natural Resources Agency to update the state’s climate adaptation strategy, Safeguarding California, every 3 years, and to ensure that its provisions are fully implemented.

SB 32, Chapter 249, 2016, codifies the GHG reduction targets established in EO B-30-15 to achieve a mid-range goal of 40 percent below 1990 levels by 2030.

SB 1386, Chapter 545, 2016, declared “it to be the policy of the state that the protection and management of natural and working lands...is an important strategy in meeting the state’s greenhouse gas reduction goals, and would require all state agencies, departments, boards, and commissions to consider this policy when revising, adopting, or establishing policies, regulations, expenditures, or grant criteria relating to the protection and management of natural and working lands.”

AB 134, Chapter 254, 2017, allocates Greenhouse Gas Reduction Funds and other sources to various clean vehicle programs, demonstration/pilot projects, clean vehicle rebates and projects, and other emissions-reduction programs statewide.

SB 743, Chapter 386 (September 2013): This bill changes the metric of consideration for transportation impacts pursuant to CEQA from a focus on automobile delay to alternative methods focused on vehicle miles travelled, to promote the state’s goals of reducing greenhouse gas emissions and traffic related air pollution and promoting multimodal transportation while balancing the needs of congestion management and safety.

SB 150, Chapter 150, 2017, Regional Transportation Plans: This bill requires CARB to prepare a report that assesses progress made by each metropolitan planning organization in meeting their established regional greenhouse gas emission reduction targets.

EO B-55-18 (September 2018) sets a new statewide goal to achieve and maintain carbon neutrality no later than 2045. This goal is in addition to existing statewide targets of reducing GHG emissions.

EO N-19-19 (September 2019) advances California’s climate goals in part by directing the California State Transportation Agency to leverage annual transportation spending to reverse the trend of increased fuel consumption and reduce GHG emissions from the transportation sector. It orders a focus on transportation investments near housing, managing congestion, and encouraging alternatives to driving. This EO also directs CARB to

⁴⁶ GHGs differ in how much heat each trap in the atmosphere (global warming potential, or GWP). CO₂ is the most important GHG, so amounts of other gases are expressed relative to CO₂, using a metric called “carbon dioxide equivalent” (CO_{2e}). The global warming potential of CO₂ is assigned a value of 1, and the GWP of other gases is assessed as multiples of CO₂.

encourage automakers to produce more clean vehicles, formulate ways to help Californians purchase them, and propose strategies to increase demand for zero-emission vehicles.

3.3.2 ENVIRONMENTAL SETTING

The proposed project is in an urban area of Alameda County with a well-developed road and street network. The project area is mainly urban, industrial, and commercial land uses interspersed with residential neighborhoods. Congestion and delay in the study area adversely affects efficient goods movement to and from Hayward's ITI Corridor. Plan Bay Area 2040 is an updated long-range RTP and SCS for the nine-county San Francisco Bay Area. This document discusses how the Bay Area will grow over the next two decades and identifies transportation and land use strategies to enable a more sustainable, equitable and economically vibrant future.

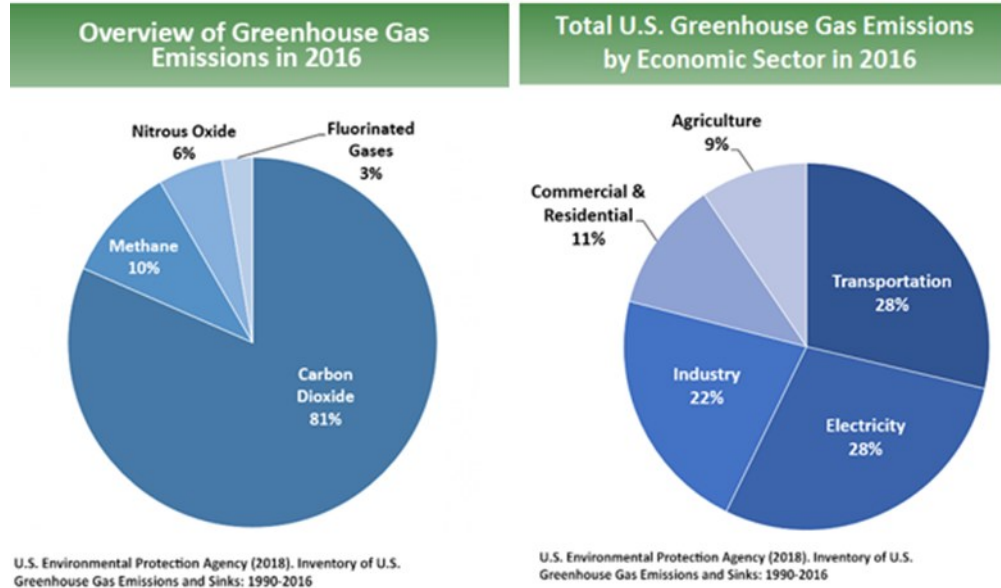
A GHG emissions inventory estimates the amount of GHGs discharged into the atmosphere by specific sources over a period of time, such as a calendar year. Tracking annual GHG emissions allows countries, states, and smaller jurisdictions to understand how emissions are changing and what actions may be needed to attain emission reduction goals. U.S. EPA is responsible for documenting GHG emissions nationwide, and the CARB does so for the state, as required by H&SC Section 39607.4.

NATIONAL GHG INVENTORY

The U.S. EPA prepares a national GHG inventory every year and submits it to the United Nations in accordance with the Framework Convention on Climate Change. The inventory provides a comprehensive accounting of all human-produced sources of GHGs in the United States, reporting emissions of CO₂, CH₄, N₂O, HFCs, perfluorocarbons, SF₆, and nitrogen trifluoride. It also accounts for emissions of CO₂ that are removed from the atmosphere by "sinks" such as forests, vegetation, and soils that uptake and store CO₂ (carbon sequestration). The 1990–2016 inventory found that of 6,511 MMTCO₂e GHG emissions in 2016, 81 percent consist of CO₂, 10 percent are CH₄, and 6 percent are N₂O; the balance consists of fluorinated gases.⁴⁷ In 2016, GHG emissions from the transportation sector accounted for nearly 28.5 percent of U.S. GHG emissions.

⁴⁷ U.S. Environmental Protection Agency (U.S. EPA). 2018. Inventory of U.S. Greenhouse Gas Emissions and Sinks. <https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks>. Accessed: August 21, 2019.

Figure 3.3.-1 U.S. 2016 Greenhouse Gas Emissions



STATE GHG INVENTORY

CARB collects GHG emissions data for transportation, electricity, commercial/residential, industrial, agricultural, and waste management sectors each year. It then summarizes and highlights major annual changes and trends to demonstrate the state's progress in meeting its GHG reduction goals. The 2019 edition of the GHG emissions inventory found total California emissions of 424.1 MMTCO_{2e} for 2017, with the transportation sector responsible for 41 percent of total GHGs. It also found that overall statewide GHG emissions declined from 2000 to 2017 despite growth in population and state economic output.⁴⁸

⁴⁸ California Air Resources Board (CARB). 2019a. California Greenhouse Gas Emissions Inventory–2019 Edition. <https://ww3.arb.ca.gov/cc/inventory/data/data.htm>. Accessed: August 21, 2019.

Figure 3.3.-2 California 2017 Greenhouse Gas Emissions

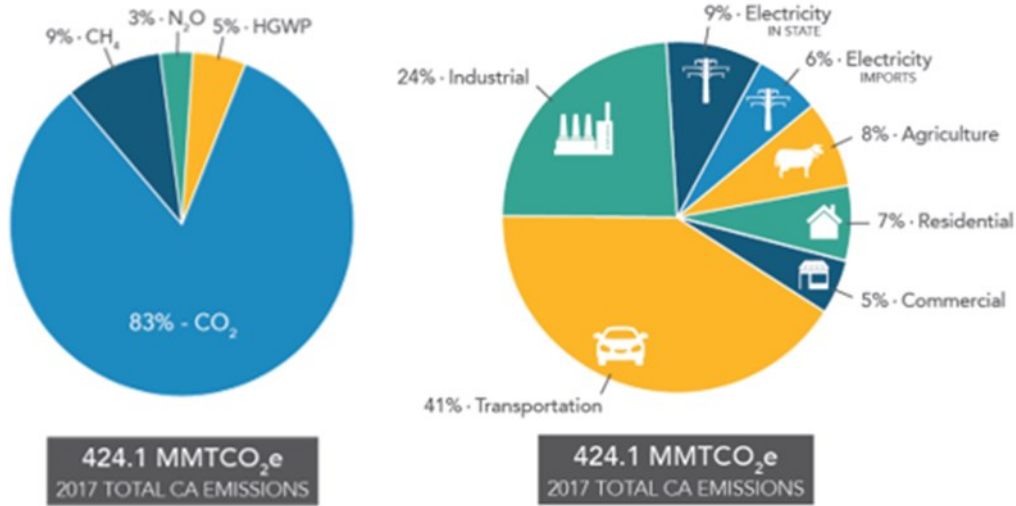
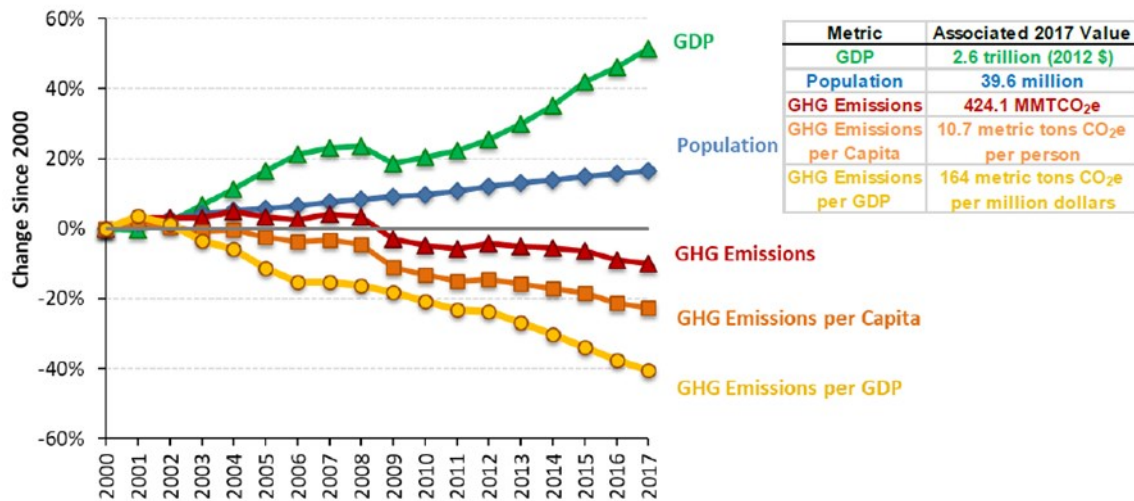


Figure 3.3.-3 Change in California GDP, Population, and GHG Emissions Since 2000



Source: CARB, California Greenhouse Gas Emissions for 2000 to 2017. Trends of Emissions and Other Indicators.

AB 32 required CARB to develop a scoping plan that describes the approach California will take to achieve the goal of reducing GHG emissions to 1990 levels by 2020, and to update it every 5 years. CARB adopted the first scoping plan in 2008. The second updated plan, California’s 2017 Climate Change Scoping Plan, adopted on December 14, 2017, reflects the 2030 target established in EO B-30-15 and SB 32. The AB 32 Scoping Plan and the subsequent updates contain the main strategies California will use to reduce GHG emissions.

REGIONAL PLANS

CARB sets regional targets for California's 18 MPOs to use in their RTP/SCS to plan future projects that will cumulatively achieve GHG reduction goals. Targets are set at a percent reduction of passenger vehicle GHG emissions per person from 2005 levels. The proposed project is included in the RTP/SCS for Plan Bay Area 2040. The regional reduction target for the Association of Bay Area Governments is 19 percent by 2035.⁴⁹

Plan Bay Area 2040 identifies how the Bay Area will grow over the next two decades and identifies transportation and land use strategies to enable a more sustainable, equitable and economically vibrant future.

Alameda County approved a Community CAP for unincorporated areas in 2014, as an element of the County's general plan.⁵⁰ The CAP established a GHG emissions reduction target of 15 percent below 2005 baseline conditions and developed a set of measures calculated to achieve a 15.6 percent reduction below 2005 conditions. Transportation-related measures relevant to this project are listed in Table 3.3.2-1.

Hayward adopted a CAP in 2009, which was updated and incorporated into the city's general plan in 2014. It stated policies and implementation plans with the objectives of reducing Hayward's GHG emissions by 20 percent below 2005 baseline levels by 2020; 61.7 percent below 2005 baseline levels by 2040; and 82.5 percent below 2005 baseline levels by 2050.⁵¹ Examples of GHG reduction policies relevant to this project are listed in Table 3.3.2-1.

Union City adopted a CAP in 2010, with a goal of reducing GHG emissions 20 percent below 2005 levels by 2020, and strategies for achieving it.⁵² Potentially relevant policies and measures are listed in Table 3.3.2-1.

⁴⁹ California Air Resources Board (CARB). 2019c. SB 375 Regional Plan Climate Targets. <https://ww2.arb.ca.gov/our-work/programs/sustainable-communities-program/regional-plan-targets>. Accessed: August 21, 2019.

⁵⁰ Alameda County. 2014. *Community Climate Action Plan*. Final. Approved February 4, 2014. http://www.acgov.org/cda/planning/generalplans/documents/110603_Alameda_CCAP_Final.pdf. Accessed: August 6, 2020.

⁵¹ City of Hayward. 2014. *Summary of Climate Action Plan Policies & Programs*. Adopted on July 2014 as part of the 2040 General Plan Policy Document. <https://www.hayward-ca.gov/services/city-services/climate-action>. Accessed: August 6, 2020.

⁵² Union City. 2010. *Climate Action Plan*. Prepared by AECOM. Adopted November 2010. <https://www.unioncity.org/379/Climate-Action-Plan>. Accessed: August 6, 2020.

Table 3.3.2-1 Regional and Local Greenhouse Gas Reduction Plans

Plan	GHG Reduction Policies and Strategies
Alameda County <i>Community CAP</i> (for unincorporated areas)	<p>T-2 Develop appropriate bicycle infrastructure for high-traffic intersections and corridors</p> <p>T-4 Enhance pedestrian infrastructure within easy walking distance from community activity centers</p> <p>T-6 Improve pedestrian connectivity and route choice in neighborhoods</p>
Hayward <i>Summary of CAP Policies & Programs</i> (Adopted on July 2014 as part of the 2040 General Plan Policy Document)	<p>M-1.6 Bicycling, Walking, and Transit Amenities: The City shall encourage the development of facilities and services, (e.g., secure term bicycle parking, street lights, street furniture and trees, transit stop benches and shelters, and street sweeping of bike lanes) that enable bicycling, walking, and transit use to become more widely used modes of transportation and recreation.</p> <p>M-5.1 Pedestrian Needs: The City shall consider pedestrian needs, including appropriate improvements to crosswalks, signal timing, signage, and curb ramps, in long-range planning and street design</p> <p>M-6.2 Encourage Bicycle Use: The City shall encourage bicycle use in all neighborhoods, especially where short trips are most common.</p> <p>M-8.1 Increase Vehicle Occupancy: The City shall work with a broad range of agencies (e.g., Metropolitan Transportation Commission, BAAQMD, AC Transit, Caltrans) to encourage and support programs that increase vehicle occupancy including the provision of traveler information, shuttles, preferential parking for carpools/vanpools, transit pass subsidies, and other methods.</p>
Union City CAP	<p>T-4 Transportation Policies</p> <p>Action C: Adopt a resolution that directs the City to balance investment in walking, biking, public transit, carpooling, and automobile use.</p> <p>Action D: Advocate for regional and State transportation strategies for reducing GHG emissions.</p> <p>Reduction Measures</p>

Plan	GHG Reduction Policies and Strategies
	<p>T-1.1 Continue build-out (goal of 25% build-out), to the extent feasible, of the Pedestrian and Bicycle Master Plan by 2020.</p> <p>T-2.1 Provide transit priority and express routes on the Alvarado-Niles and Whipple corridors.</p>

3.3.3 PROJECT ANALYSIS

GHG emissions from transportation projects can be divided into those produced during operation of the SHS and those produced during construction. The primary GHGs produced by the transportation sector are CO₂, CH₄, N₂O, and HFCs. CO₂ emissions are a product of the combustion of petroleum-based products, like gasoline, in internal combustion engines. Relatively small amounts of CH₄ and N₂O are emitted during fuel combustion. In addition, a small amount of HFC emissions are included in the transportation sector.

The CEQA Guidelines generally address greenhouse gas emissions as a cumulative impact due to the global nature of climate change (Public Resources Code, § 21083(b)(2)). As the California Supreme Court explained, “because of the global scale of climate change, any one project’s contribution is unlikely to be significant by itself.” (Cleveland National Forest Foundation v. San Diego Assn. of Governments (2017) 3 Cal.5th 497, 512.) In assessing cumulative impacts, it must be determined if a project’s incremental effect is “cumulatively considerable” (CEQA Guidelines Sections 15064(h)(1) and 15130).

To make this determination, the incremental impacts of the project must be compared with the effects of past, current, and probable future projects. Although climate change is ultimately a cumulative impact, not every individual project that emits greenhouse gases must necessarily be found to contribute to a significant cumulative impact on the environment.

3.3.4 OPERATIONAL EMISSIONS

CO₂ accounts for 95 percent of transportation GHG emissions in the U.S. The largest sources of transportation-related GHG emissions are passenger cars and light-duty trucks, including sport utility vehicles, pickup trucks, and minivans. These sources account for over half of the emissions from the sector. The remainder of GHG emissions comes from other modes of transportation, including freight trucks, commercial aircraft, ships, boats, and trains, as well as pipelines and lubricants. Because CO₂ emissions represent the greatest percentage of GHG emissions it has been selected as a proxy within the following analysis for potential climate change impacts generally expected to occur.

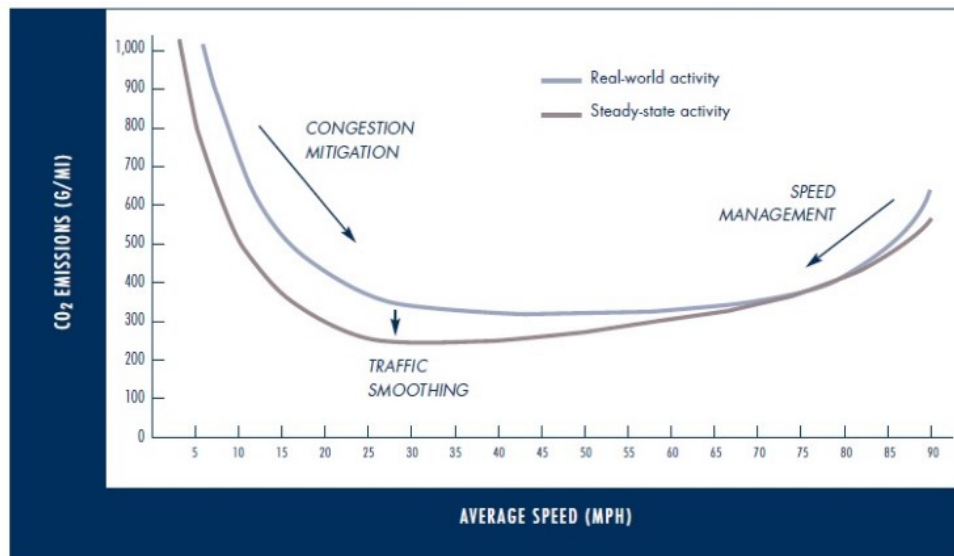
Four primary strategies can reduce GHG emissions from transportation sources: (1) improving the transportation system and operational efficiencies, (2) reducing travel activity), (3) transitioning to lower GHG-emitting fuels, and (4) improving vehicle technologies/efficiency. To be most effective all four strategies should be pursued concurrently.

FHWA supports these strategies to lessen climate change impacts, which correlate with efforts that the state of California is undertaking to reduce GHG emissions from the transportation sector.

The highest levels of CO₂ from mobile sources such as automobiles occur at stop-and-go speeds (0–25 miles per hour) and speeds over 55 miles per hour; the most severe emissions occur from 0–25 miles per hour (see Figure 3.3-4 below). To the extent that a project relieves congestion by enhancing operations and improving travel times in high-congestion travel corridors, GHG emissions, particularly CO₂, may be reduced.

The project is included in MTC's current RTP, Plan Bay Area 2040. The I-880/Industrial Parkway West Interchange improvement is included in the RTP under reference number ID 17-01-0023. This improvement is also included in the MTC 2019 TIP under reference number ID ALA110002. The I-880/Whipple Road-Industrial Parkway Southwest Interchange improvement is included in the RTP under reference number ID 17-01-0021. This improvement is also included in the MTC 2019 TIP under reference number ID ALA170005. MTC adopted the 2019 TIP on September 26, 2018. FHWA approved and incorporated the TIP into the Federal Statewide Transportation Improvement Program on December 17, 2018. The RTP and TIP listings for the project are included in the TOAR.

Figure 3.3-4 Possible Use of Traffic Operation Strategies in Reducing On-Road CO₂ Emissions



Source: Barth and Boriboonsomsin 2010⁵³

The project would improve travel along the I-880 corridor within the study limits by reconfiguring interchange on- and off-ramps, modifying and/or replacing bridge structures, realigning and restriping local roadway, and increasing bicycle and pedestrian access. The project's long-term operational emissions of GHGs are evaluated further below.

A quantitative analysis of daily CO₂ emissions was performed using the Caltrans CT-EMFAC2014 model to compare the potential effects of the project Build and No-Build Alternatives. Traffic speed and VMT distributions for existing (2018), opening year (2025), and design year (2045) conditions in the regional study area affected by the project were provided by the project traffic consultant (Kittelsohn & Associates 2019). The traffic speed and VMT distributions would be the same for each build scenario. The default fleet mixes were used for each model run. The CT-EMFAC2014 modeling results are included in the TOAR.

⁵³ Barth, Matthew and Kanok Boriboonsomsin. 2010. *Real-World Carbon Dioxide Impacts of Traffic Congestion*. Berkeley, CA: University of California Transportation Center. UCTC-FR-2010-11. Available: <https://www.researchgate.net/publication/46438207>.

As shown in Table 3.3.4-1, the estimated daily CO₂ emissions for the Build Alternatives during the opening year (2025), horizon year (2040), and design year (2045) scenarios would be lower than the emissions for the No-Build Alternative, because the Build Alternatives would improve local traffic flow. Emissions for both the Build and No-Build Alternatives would also be lower in the opening year (2025), horizon year (2040), and design year (2045) compared to the existing year (2018), because federal and state fuel economy standards are expected to reduce GHG emissions over time.⁵⁴ Annual VMT is projected to increase over time for both the Build and No-Build Alternatives. Also shown in Table 3.3.4-1, regional VMT would decrease for the Build Alternatives compared to the No-Build Alternative during both the opening year (2025) and design year (2045) scenarios, because the improvements to the I-880/Whipple Road-Industrial Parkway Southwest and I-880/Industrial Parkway West interchanges would improve traffic flow along the I-880 and reduce diversions of traffic onto the local street network. In conclusion, the modeling results show that the Build Alternatives would not result in an increase in CO₂ emissions compared to current year conditions or the future No-Build Alternative.

Table 3.3.4-1 Modeled Annual CO₂ Emissions and Vehicle Miles Traveled, by Alternative

Build Alternative	CO ₂ Emissions (Metric Tons/Year)	Annual Vehicle Miles Traveled ¹
Existing/Baseline 2018	286,500	620,188,038
Open to Traffic 2025		
No Build	257,600	649,587,776
Build Alternative 1	257,100	648,401,185
Build Alternative 2	257,100	648,401,185

⁵⁴ This analysis does not currently account for the effects of the U.S. National Highway Traffic Safety Administration and Environmental Protection Agency SAFE (Safer Affordable Fuel-Efficient) Vehicles Rule. Part One revoking California's authority to set its own greenhouse gas emissions standards was published on September 27, 2019 and effective November 26, 2019. The SAFE Vehicles Rule Part Two became effective June 30, 2020. It amends existing Corporate Average Fuel Economy (CAFE) and tailpipe carbon dioxide emissions standards for passenger cars and light trucks and establishes new standards covering model years 2021 through 2026. The proposal would retain the model year 2020 standards for both programs through model year 2026. Although this analysis does not incorporate adjustment factors for greenhouse gas emissions based on the SAFE Rule, modeling these estimates with EMFAC2014 remains a suitable means of estimating future greenhouse gas emissions.

Build Alternative	CO ₂ Emissions (Metric Tons/Year)	Annual Vehicle Miles Traveled ¹
Build Alternative 3	257,100	648,401,185
20-Year Horizon/Design-Year 2040/2045		
No Build	260,300/258,400	733,587,029
Build Alternative 1	259,900/258,000	732,546,148
Build Alternative 2	259,900/258,000	732,546,148
Build Alternative 3	259,900/258,000	732,546,148

Source: EMFAC 2014; Kittleson & Associates, 2019; Baseline Environmental Consulting, 2019

¹ Annual vehicle miles traveled (VMT) values derived from Daily VMT values multiplied by 347, per CARB methodology (CARB 2008).

3.3.5 CONSTRUCTION EMISSIONS

Construction GHG emissions would result from material processing, on-site construction equipment, and traffic delays due to construction. These emissions will be produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic management during construction phases.

In addition, with innovations such as longer pavement lives, improved traffic management plans, and changes in materials, the GHG emissions produced during construction can be offset to some degree by longer intervals between maintenance and rehabilitation activities.

The total CO_{2e} emissions and annual average CO_{2e} emissions estimated for construction of each Build Alternative are summarized below in Table 3.3.5-1.⁵⁵ The temporary increase in GHG emissions resulting from project construction would be offset by the long-term improvement in operational GHG emissions compared with the No-Build Alternative.

⁵⁵ RCEM Version 8.1.0 was used for this analysis.

Table 3.3.5-1 Construction CO₂e Emissions

Build Scenario	CO ₂ e ¹ (Total Metric Tons)	CO ₂ e (Annual Average Metric Tons)
Build Alternative 1	3,047	1,143
Build Alternative 1 with Design Variation 1	1,931	724
Build Alternative 2	3,564	1,337
Build Alternative 3	3,032	1,137

Source: Baseline Environmental Consulting, 2019

¹CO₂e contains the following GHG's: Carbon Dioxide, Nitrous Oxide, Fluorinated Gases, and Methane

All construction contracts include Caltrans Standard Specifications Section 7-1.02A and 7 1.02C, Emissions Reduction, which require contractors to comply with all laws applicable to the project and to certify they are aware of and will comply with all CARB emission reduction regulations; and Section 14-9.02, Air Pollution Control, which requires contractors to comply with all air pollution control rules, regulations, ordinances, and statutes. Certain common regulations, such as equipment idling restrictions, that reduce construction vehicle emissions also help reduce GHG emissions.

3.3.6 CEQA CONCLUSION

While the proposed project will result in GHG emissions during construction, it is anticipated that the project will not result in any increase in operational GHG emissions. The proposed project does not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases. With implementation of construction GHG-reduction measures, the impact would be less than significant.

Caltrans is firmly committed to implementing measures to help reduce GHG emissions. These measures are outlined in the following section.

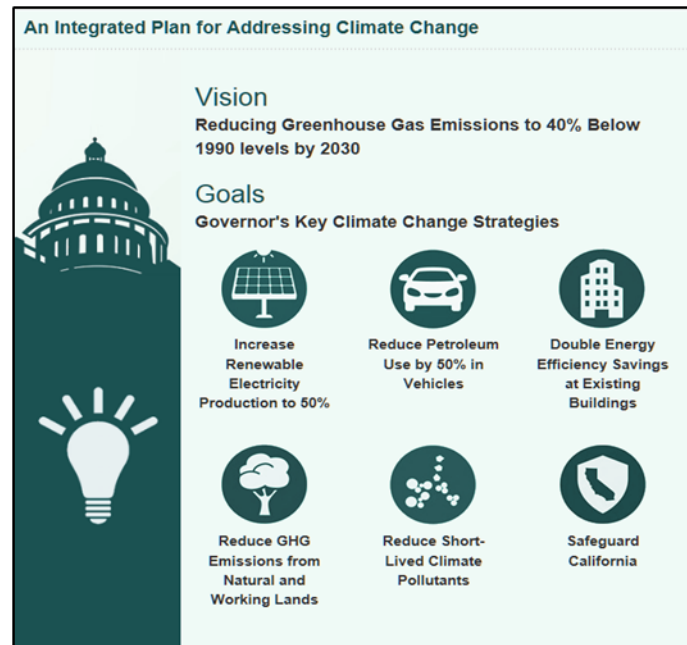
3.3.7 GREENHOUSE GAS REDUCTION STRATEGIES

STATEWIDE EFFORTS

Major sectors of the California economy, including transportation, will need to reduce emissions to meet the 2030 and 2050 GHG emissions targets. Former Governor Edmund G. Brown promoted GHG reduction goals that involved (1) reducing today's petroleum use in

cars and trucks by up to 50 percent; (2) increasing from one-third to 50 percent our electricity derived from renewable sources; (3) doubling the energy efficiency savings achieved at existing buildings and making heating fuels cleaner; (4) reducing the release of methane, black carbon, and other short-lived climate pollutants; (5) managing farms and rangelands, forests, and wetlands so they can store carbon; and (6) periodically updating the state's climate adaptation strategy, Safeguarding California.

Figure 3.3-5 California Climate Change Strategy



The transportation sector is integral to the people and economy of California. To achieve GHG emission reduction goals, it is vital that we build on our past successes in reducing criteria and toxic air pollutants from transportation and goods movement activities. GHG emission reductions will come from cleaner vehicle technologies, lower-carbon fuels, and reduction of vehicle miles traveled. . A key state goal for reducing GHG emissions is to reduce today's petroleum use in cars and trucks by up to 50 percent by 2030.⁵⁶

In addition, SB 1386 (Wolk 2016) established as state policy the protection and management of natural and working lands and requires state agencies to consider that policy in their own decision making. Trees and vegetation on forests, rangelands, farms, and wetlands remove carbon dioxide from the atmosphere through biological processes and sequester the carbon in above- and below-ground matter.

⁵⁶ State of California. 2019. California Climate Strategy. <https://www.climatechange.ca.gov/>. Accessed: August 21, 2019.

CALTRANS ACTIVITIES

Caltrans continues to be involved on the Governor's Climate Action Team as the CARB works to implement EOs S-3-05 and S-01-07 and help achieve the targets set forth in AB 32. EO B-30-15, issued in April 2015, and SB 32 (2016), set a new interim target to cut GHG emissions to 40 percent below 1990 levels by 2030. The following major initiatives are underway at Caltrans to help meet these targets.

California Transportation Plan (CTP 2040)

The California Transportation Plan (CTP) is a statewide, long-range transportation plan to meet our future mobility needs and reduce GHG emissions. In 2016, Caltrans completed the California Transportation Plan 2040, which establishes a new model for developing ground transportation systems, consistent with CO₂ reduction goals. It serves as an umbrella document for all the other statewide transportation planning documents. Over the next 25 years, California will be working to improve transit and reduce long-run repair and maintenance costs of roadways and developing a comprehensive assessment of climate-related transportation demand management and new technologies rather than continuing to expand capacity on existing roadways.

SB 391 (Liu 2009) requires the CTP to meet California's climate change goals under AB 32. Accordingly, the CTP 2040 identifies the statewide transportation system needed to achieve maximum feasible GHG emission reductions while meeting the state's transportation needs. While MPOs have primary responsibility for identifying land use patterns to help reduce GHG emissions, CTP 2040 identifies additional strategies in Pricing, Transportation Alternatives, Mode Shift, and Operational Efficiency.

Caltrans Strategic Management Plan

The Strategic Management Plan, released in 2015, creates a performance-based framework to preserve the environment and reduce GHG emissions, among other goals. Specific performance targets in the plan that will help to reduce GHG emissions include:

- Increasing percentage of non-auto mode share
- Reducing VMT
- Reducing Caltrans' internal operational (buildings, facilities, and fuel) GHG emissions

Funding and Technical Assistance Programs

In addition to developing plans and performance targets to reduce GHG emissions, Caltrans also administers several sustainable transportation planning grants. These grants

encourage local and regional multimodal transportation, housing, and land use planning that furthers the region's RTP/SCS; contribute to the state's GHG reduction targets and advance transportation-related GHG emission reduction project types/strategies; and support other climate adaptation goals (e.g., Safeguarding California).

Caltrans Policy Directives and Other Initiatives

Caltrans Director's Policy 30 (DP-30) Climate Change (June 22, 2012) is intended to establish a Department policy that will ensure coordinated efforts to incorporate climate change into Departmental decisions and activities. Caltrans Activities to Address Climate Change (April 2013) provides a comprehensive overview of Caltrans' statewide activities to reduce GHG emissions resulting from agency operations.

Project-Level GHG Reduction Strategies

To reduce GHG emissions during construction, equipment used would be required to meet the U.S. EPA's engine tier criteria in addition to Caltrans' Standard Specifications and other Caltrans requirements to minimize GHG emissions.

Caltrans Standard Specifications Section 7-1.02C "Emissions Reduction" and Section 14-9.02, "Air Pollution Control" ensure contractors will comply with all applicable regulations such as keeping engines properly tuned and limiting idling time to reduce emissions.

- TRA-1, Transportation Management Plan, will help avoid and reduce traffic delays and idling emissions during construction.

Once operational, the Build Alternatives would alleviate local traffic congestion and reduce regional VMT, reducing daily GHG emissions compared to the No-Build Alternative long term.

Bicycle and pedestrian improvements proposed by the project would increase multi-modal transportation options within the region.

Adaptation

Reducing GHG emissions is only one part of an approach to addressing climate change. Caltrans must plan for the effects of climate change on the state's transportation infrastructure and strengthen or protect the facilities from damage. Climate change is expected to produce increased variability in precipitation, rising temperatures, rising sea levels, variability in storm surges and their intensity, and in the frequency and intensity of wildfires. Flooding and erosion can damage or wash out roads; longer periods of intense heat can buckle pavement and railroad tracks; storm surges combined with a rising sea level can inundate highways. Wildfire can directly burn facilities and indirectly cause damage when rain falls on denuded slopes that landslide after a fire. Effects will vary by

location and may, in the most extreme cases, require that a facility be relocated or redesigned. Accordingly, Caltrans must consider these types of climate stressors in how highways are planned, designed, built, operated, and maintained.

Federal Efforts

Under NEPA assignment, Caltrans is obligated to comply with all applicable federal environmental laws and FHWA NEPA regulations, policies, and guidance.

The U.S. Global Change Research Program (USGCRP) delivers a report to Congress and the president every 4 years, in accordance with the Global Change Research Act of 1990 (15 U.S.C. ch. 56A § 2921 et seq). The Fourth National Climate Assessment, published in 2018, presents the foundational science and the “human welfare, societal, and environmental elements of climate change and variability for 10 regions and 18 national topics, with particular attention paid to observed and projected risks, impacts, consideration of risk reduction, and implications under different mitigation pathways.” Chapter 12, “Transportation,” presents a key discussion of vulnerability assessments. It notes that “asset owners and operators have increasingly conducted more focused studies of particular assets that consider multiple climate hazards and scenarios in the context of asset-specific information, such as design lifetime.”⁵⁷

The U.S. DOT Policy Statement on Climate Adaptation in June 2011 committed the federal Department of Transportation to “integrate consideration of climate change impacts and adaptation into the planning, operations, policies, and programs of DOT in order to ensure that taxpayer resources are invested wisely, and that transportation infrastructure, services and operations remain effective in current and future climate conditions.”⁵⁸

FHWA order 5520 (Transportation System Preparedness and Resilience to Climate Change and Extreme Weather Events, December 15, 2014) established FHWA policy to strive to identify the risks of climate change and extreme weather events to current and planned transportation systems. FHWA has developed guidance and tools for transportation

⁵⁷ U.S. Global Change Research Program (USGCRP). 2018. Fourth National Climate Assessment. <https://nca2018.globalchange.gov/>. Accessed: August 21, 2019.

⁵⁸ U.S. Department of Transportation (U.S. DOT). 2011. Policy Statement on Climate Change Adaptation. June. https://www.fhwa.dot.gov/environment/sustainability/resilience/policy_and_guidance/usdot.cfm. Accessed: August 21, 2019.

planning that foster resilience to climate effects and sustainability at the federal, state, and local levels.⁵⁹

State Efforts

Climate change adaptation for transportation infrastructure involves long-term planning and risk management to address vulnerabilities in the transportation system. California's Fourth Climate Change Assessment (2018) is the state's effort to "translate the state of climate science into useful information for action" in a variety of sectors at both statewide and local scales. It adopts the following key terms used widely in climate change analysis and policy documents:

- Adaptation to climate change refers to adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.
- Adaptive capacity is the "combination of the strengths, attributes, and resources available to an individual, community, society, or organization that can be used to prepare for and undertake actions to reduce adverse impacts, moderate harm, or exploit beneficial opportunities."
- Exposure is the presence of people, infrastructure, natural systems, and economic, cultural, and social resources in areas that are subject to harm.
- Resilience is the "capacity of any entity – an individual, a community, an organization, or a natural system – to prepare for disruptions, to recover from shocks and stresses, and to adapt and grow from a disruptive experience". Adaptation actions contribute to increasing resilience, which is a desired outcome or state of being.
- Sensitivity is the level to which a species, natural system, or community, government, etc., would be affected by changing climate conditions.
- Vulnerability is the "susceptibility to harm from exposure to stresses associated with environmental and social change and from the absence of capacity to adapt." Vulnerability can increase because of physical (built and environmental), social, political, and/or economic factor(s). These factors include, but are not limited to: ethnicity, class, sexual orientation and identification, national origin, and income

⁵⁹ Federal Highway Administration (FHWA). 2019. Sustainability. <https://www.fhwa.dot.gov/environment/sustainability/resilience/>. Last updated February 7, 2019. Accessed: August 21, 2019.

inequality. Vulnerability is often defined as the combination of sensitivity and adaptive capacity as affected by the level of exposure to changing climate.

- Vulnerability is the “susceptibility to harm from exposure to stresses associated with environmental and social change and from the absence of capacity to adapt.” Vulnerability can increase because of physical (built and environmental), social, political, and/or economic factor(s). These factors include, but are not limited to: ethnicity, class, sexual orientation and identification, national origin, and income inequality. Vulnerability is often defined as the combination of sensitivity and adaptive capacity as affected by the level of exposure to changing climate.

Several key state policies have guided climate change adaptation efforts to date. Recent state publications produced in response to these policies draw on these definitions.

EO S-13-08, issued by then-governor Arnold Schwarzenegger in November 2008, focused on sea-level rise, and resulted in the California Climate Adaptation Strategy (2009), updated in 2014 as Safeguarding California: Reducing Climate Risk (Safeguarding California Plan). The Safeguarding California Plan offers policy principles and recommendations and continues to be revised and augmented with sector-specific adaptation strategies, ongoing actions, and next steps for agencies.

EO S-13-08 also led to the publication of a series of sea-level rise assessment reports and associated guidance and policies. These reports formed the foundation of an interim State of California Sea-Level Rise Interim Guidance Document (SLR Guidance) in 2010, with instructions for how state agencies could incorporate “sea-level rise projections into planning and decision making for projects in California” in a consistent way across agencies. The guidance was revised and augmented in 2013. *Rising Seas in California – An Update on Sea-Level Rise Science* was published in 2017 and its updated projections of sea-level rise and new understanding of processes and potential impacts in California were incorporated into the State of California Sea-Level Rise Guidance Update in 2018.

EO B-30-15, signed in April 2015, requires state agencies to factor climate change into all planning and investment decisions. This EO recognizes that effects of climate change other than sea-level rise also threaten California’s infrastructure. At the direction of EO B-30-15, the Office of Planning and Research published *Planning and Investing for a Resilient California: A Guidebook for State Agencies* in 2017, to encourage a uniform and systematic approach. Representatives of Caltrans participated in the multi-agency, multidisciplinary technical advisory group that developed this guidance on how to integrate climate change into planning and investment.

AB 2800 (Quirk 2016) created the multidisciplinary Climate-Safe Infrastructure Working Group, which in 2018 released its report, *Paying it Forward: The Path Toward Climate-Safe Infrastructure in California*. The report provides guidance to agencies on how to address the challenges of assessing risk in the face of inherent uncertainties still posed by the best available science on climate change. It also examines how state agencies can use infrastructure planning, design, and implementation processes to address the observed and anticipated climate change impacts.

Caltrans Adaption Efforts

Caltrans Vulnerability Assessments

Caltrans is conducting climate change vulnerability assessments to identify segments of the State Highway System vulnerable to climate change effects including precipitation, temperature, wildfire, storm surge, and sea-level rise. The approach to the vulnerability assessments was tailored to the practices of a transportation agency, and involves the following concepts and actions:

- Exposure – Identify Caltrans assets exposed to damage or reduced service life from expected future conditions.
- Consequence – Determine what might occur to system assets in terms of loss of use or costs of repair.
- Prioritization – Develop a method for making capital programming decisions to address identified risks, including considerations of system use and/or timing of expected exposure.

The climate change data in the assessments were developed in coordination with climate change scientists and experts at federal, state, and regional organizations at the forefront of climate science. The findings of the vulnerability assessments will guide analysis of at-risk assets and development of adaptation plans to reduce the likelihood of damage to the State Highway System, allowing Caltrans to both reduce the costs of storm damage and to provide and maintain transportation that meets the needs of all Californians.

Project Adaptation Analysis

Although CEQA does not require analysis of effects of climate change on a project, an environmental document should disclose if a project would exacerbate the effects of climate change related to flooding, hazards, and wildfire.

Climate-change risk analysis involves uncertainties as to the timing and intensity of potential risks. Such uncertainties may be documented in the project's risk register. For example, if a protective design feature is not implemented in the project because of cost,

the future consequence may be a greater cost (in dollars, time, and lost services) to repair damage.

Sea-Level Rise

The project site is not located near a designated coastal zone

Floodplains

The District 4 Caltrans Climate Change Vulnerability Assessment⁶⁰ discusses how climate change is expected to bring less precipitation falling in heavier individual rainfall events in the District. These heavier events may change and become more frequent over time. To evaluate how to incorporate the risk of such events in the design of transportation assets, analysts consider changes in the 100-year return period storm event. As discussed in Section 2.2.1, Hydrology and Floodplain, water courses within project limits consist of flood control channels. Where the project would cause a floodplain encroachment in Ward Creek, it would remove obstructions, reducing water surface elevations and improving flood flows. Implementation of the Build Alternatives would result in a small increase in impervious surface area. This marginal increase would not significantly affect the regional level of impervious surface area or alter the 100-year flood water surface elevations. However, 0.19 feet of overtopping of the eastern maintenance road and levees was modeled. Levee overtopping, however minimal, would influence flood elevations in the eastern floodplain. Measure HYDRO-1 would require further hydraulic analysis to take place to confirm the existing channel condition and overtopping level, if any, due to project construction. If flooding increases in frequency or severity as a result of climate change, flood plains may need to be remapped. The reduction in water surface elevation in Ward Creek and design adjustments based on further hydraulic analysis will ensure the project's resilience to potential changes in precipitation and flooding under climate change.

Wildfire

As discussed in Section 3.2.20, Wildfire, the project site is not located within a State Responsibility Area, nor is it near land classified as a very high fire hazard severity zone. It is located in a built-up urban area. Accordingly, direct impacts to transportation facilities due to increasing wildfire risk and severity are not expected.

⁶⁰ Ibid.

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4.0 COMMENTS AND COORDINATION

4.1 DOCUMENT COORDINATION

Early and continuing coordination with the general public and public agencies is an essential part of the environmental process. It helps Caltrans determine the necessary scope of environmental documentation and the level of analysis required, and to identify potential impacts and avoidance, minimization, and/or mitigation measures and related environmental requirements. Agency consultation and public participation for the project have been accomplished through a variety of formal and informal methods, including project development team (PDT) meetings, interagency coordination meetings, and public meetings. This chapter summarizes the results of Caltrans' efforts to fully identify, address, and resolve project-related issues through early and continuing coordination.

4.1.1 PUBLIC AND AGENCY SCOPING PROCESS

ACTC and Caltrans conducted outreach during the scoping for this project. Communication efforts included several channels of outreach, including:

- Postcard mailer to residents within a 2-mile radius of the project limits; a total of 8,899 addresses
- *The Daily Review*, a local newspaper ad, for two weeks beginning Friday, January 11, 2019; a circulation of 7,400
- *The San Jose Mercury News* ad published January 23rd, 2019, the same day as the public meeting
- City of Hayward and Union City e-blast via their respective e-blast networks

Alameda CTC, Caltrans, and the project design team held a public meeting which took place on January 23, 2019, at the Matt Jimenez Community Center in Hayward, CA, to solicit input on the preliminary Build Alternatives from local agencies and the community. The location was chosen due to its accessibility and its proximity to the project site. A total of 28 members of the public were in attendance.

Many of the concerns raised by the public pertained to the construction period such as how potential disruptions to traffic will be mitigated, particulate debris and noise pollution. There was concern regarding how construction will affect traffic (e.g., people may take surface streets to avoid construction, traffic may increase temporarily on Whipple Road; and cutting lanes down from 5 to 3 may not give drivers enough time to merge). The public expressed excitement about the bike lanes, the idea of adding a northbound off-ramp at Industrial Pkwy and the Whipple Road roadway improvements (i.e. the two left turn lanes).

4.1.2 CONSULTATION AND COORDINATION WITH PUBLIC AGENCIES

PROJECT DEVELOPMENT TEAM

Regular PDT meetings provided a forum for coordination, issue resolution, and information feedback between Caltrans, Alameda CTC, and project consultants.

PDT meetings have occurred since 2017 and will continue to occur throughout the remainder of the environmental and project approval process. The PDT represents various fields of expertise, including design, environmental review, traffic operations, right-of-way, and project management. Accordingly, the PDT convenes to review the project status, address issues as they arise, and provide overall direction throughout the project development process.

AGENCY CONSULTATION

In addition to PDT meetings, there are several other public agencies involved in environmental clearance and permitting of the Build Alternatives. These agencies include SHPO and the MTC Air Quality Conformity Task Force.

MTC is the regional transportation planning agency in the San Francisco Bay Area that includes the project area. MTC is responsible for updating the RTP, which is a comprehensive blueprint for the development of mass transit, highway, freight, bicycle and pedestrian facilities. MTC and ABAG program San Francisco Bay Area projects through Plan Bay Area 2040, the current RTP. The I-880/Industrial Parkway West Interchange improvement is included in the RTP under reference number ID 17-01-0023. The project is also included in the MTC 2019 TIP under reference numbers ID ALA110002 and ALA170005. The I-880/Whipple Road Interchange improvement is included in the RTP under reference numbers ID 17-01-0021 and 17-01-0023. MTC adopted the TIP on September 26, 2018. FHWA approved and incorporated the TIP into the FSTIP on December 17, 2018.

A quantitative PM analysis is required under the U.S. EPA Transportation Conformity rule for POAQC. On March 10, 2006, the U.S. EPA published a final rule that establishes the

transportation conformity criteria and procedures for determining which transportation projects must be analyzed for local air quality impacts. MTC's Air Quality Conformity Task Force met on April 25th, 2019, as part of interagency consultation for the Build Alternatives and took action to conclude that the project was not a POAQC.

Caltrans is currently in the process of procuring a jurisdictional determination from USACE.

Table 4.1.2-1 identifies permits and approvals that would be required for project implementation.

Table 4.1.2-1 Permits and Approvals Needed

Agency	Permit/Approval	Status
United States Army Corps of Engineers	Section 404 Permit – Individual	Issued during the design phase
California Department Fish and Wildlife	1602 Agreement for Streambed Alteration	Issued during the design phase
Regional Water Quality Control Board	Section 401 Certification	Issued during the design phase
State Historic Preservation Officer	Concurrence on Eligibility Determinations	Issued prior to project approval; request for concurrence submitted to SHPO on March 23, 2020. Concurrence was received on April 14, 2020.
Metropolitan Transportation Commission Air Quality Conformity Task Force Federal Highway Administration	Regional Air Quality Conformity	Issued prior to project approval

4.1.3 PUBLIC PARTICIPATION

NOTICE OF AVAILABILITY OF THE ENVIRONMENTAL DOCUMENT

A Notice of Availability was circulated to the project mailing list and to parties listed on the distribution list (see Chapter 6.0, Distribution List) on January 20, 2021. All property owners/occupants within a 500-foot radius of the project limits received a project mailer informing them of the availability of the IS/EA. The notice provided information on the

project including a summary of the alternatives being considered, where the environmental document can be reviewed, the address to where comments can be sent, and the close of the comment period.

PUBLIC MEETING

Information on this project and the Draft IS/EA will be presented at the following online public meeting: February 18, 2021 from 5:30-7:00p.m.

COMMUNITY BASED ORGANIZATIONS INVOLVEMENT

Stakeholder outreach began in Fall 2018 and has included a variety of community events. Key stakeholder groups in the project area were identified collaboratively with local agencies. Notification for each of the stakeholder meetings included email and telephone outreach. Individuals representing key stakeholder groups were contacted via email in early September. Follow-up email and phone messages were sent four to eight days prior to each stakeholder meeting, and a reminder message was sent the day-of.

Stakeholder meetings and pop-up events were selected based on their proximity to the project site. Pop-up events included attendance at Back-to-School Night at Treeview Elementary School in Hayward and the Farmers' Market in Union City. These events gave the outreach team opportunities to connect with members of the public at existing community activities. A detailed description of each stakeholder meeting and popup event is provided below.

Meeting #1: Bicycle and Pedestrian

Stakeholder Meeting #1 was held at Eden Bicycles at 3318 Village Drive on Wednesday, September 26, 2018 at 6pm. This meeting was to help inform the public about bicycle and pedestrian improvements that would be made to the I-880/Whipple Road-Industrial Parkway Southwest and I-880/Industrial Parkway West interchanges as a part of the project. Four members of the community attended and provided information on the current access and utilization of the roads in the project area. The meeting attendees also shared their concerns and comments regarding the project.

Meeting #2: Local Agencies

Stakeholder Meeting #2 was held at City of Hayward Economic Development on B Street on Thursday, September 27, 2018 at 4pm. Stakeholders participated in a discussion of current conditions at the I-880/Whipple Road-Industrial Parkway Southwest and I-880/Industrial Parkway West interchanges. The group also discussed considerations the project should

make for local agencies. There were 10 local agencies in attendance including the City of Hayward, Union City, Caltrans, and the ACFCFCD.

Meeting #3: Local Businesses, Auto Auction, and Trucking Industry

Stakeholder Meeting #3 was held at Manheim San Francisco Bay, an auto auction located in Hayward. The meeting was held on Thursday, October 11, 2018 at 3pm and had 5 local businesses and entities in attendance including the Hayward Chamber of Commerce, Manheim San Francisco Bay, Forensic Analytical, and Motel 6. The discussion and commentary served as a platform for local businesses to gain answers to project-related questions.

Meeting #4: Transit and Paratransit

The fourth stakeholder meeting was held at Union City Transit on Wednesday October 17, 2018 at 6pm. This meeting had 6 representatives from transit entities in attendance, including Alameda County Emergency Medical Services, AC Transit, Union City Public Works, A-ParaTransit, MTC, and Union City Transit. Attendees shared their concerns regarding project impacts to transit circulation.

Pop-Up Event #1: Treeview Elementary School Back to School Night

Alameda CTC hosted a table at Treeview Elementary School's Back-To-School Night, located at 30565 Treeview Street in Hayward, on September 20th, 2018, from 5:00 pm to 7:00 pm. The purpose of the tabling effort at the Back-to-School Night was to inform the public about the upcoming interchange improvement project.

Pop-Up Event #2: Union City Farmers Market

Alameda CTC hosted a table at Union City Farmers' Market, located at 30940 Watkins Street in Union City on October 27, 2018 from 8:30am to 12:00pm. The purpose of the tabling event was to inform the public about the upcoming interchange improvement project.

4.1.4 NATIVE AMERICAN CONSULTATION

Pursuant to AB 52, on December 17, 2018, archeologists contacted the NAHC requesting a search of the Sacred Lands File on behalf of the project. The NAHC responded to the request on December 18, 2018; the record search of the Sacred Lands File did not indicate the presence of Native American cultural resources within the project site or vicinity.

The NAHC provided a list of eight tribal contacts that may have information pertinent to the project area or have concerns regarding the project. On January 15, 2019, letters were sent via certified mail to the following eight contacts provided by the NAHC:

- The Amah Mutsun Tribal Band (Valentin Lopez, Representative)
- The Amah Mutsun Tribal Band (Edward Ketchum, Representative)
- The Amah Mutsun Tribal Band of Mission San Juan Bautista (Irenne Zwierlein, Chairperson)
- The Costanoan Rumsen Carmel Tribe (Tony Cerda, Chairperson)
- The Indian Canyon Mutsun Band of Costanoan (Ann Marie Sayers, Chairperson)
- The Muwekma Ohlone Indian Tribe of the San Francisco Bay Area (Charlene Nijmeh, Chairperson)
- The North Valley Yokuts Tribe (Katherine Erolinda Perez, Chairperson)
- The Ohlone Indian Tribe (Mr. Andrew Galvan, Representative)

The letters contained a preliminary project description and requested information regarding any unrecorded Native American cultural resources or other areas of concern within or adjacent to the project site. The letters also included a solicitation for comments, questions, or concerns with regard the project. On February 27, 2019, a follow-up call was initiated to all eight representatives. Tribal representative Alvin Galvan did not recall the letter, but after receiving information about the results of the cultural resources studies, agreed that requiring work to stop, should buried cultural resources be discovered during construction, was an appropriate course of action.

5.0 LIST OF PREPARERS

LOCAL AGENCY PARTNERS

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Suzanne Philis, Senior Secretary, Economic Development, City of Hayward

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Kittelson & Associates, Inc.

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Lydia Mac, Senior Landscape Architect, Office of Landscape Architecture

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6.0 DISTRIBUTION LIST

This IS/EA was distributed to the following responsible and trustee agencies and elected officials. Distribution of this IS/EA included hard copy, electronic media, reference to the web site in which the document is available, or a combination of these. Agency names marked with an asterisk (*) received copies through the State Clearinghouse.

In addition to the following list, local officials, stakeholders, community groups, businesses, and interested persons on the project mailing list were notified of the availability of this document and public meetings as described in Chapter 4.0, Comments and Coordination. Furthermore, all property owners/occupants within a 500-foot radius of the project site received a project mailer informing them of the availability of the IS/EA.

FEDERAL AGENCIES

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The Honorable Diane Feinstein
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The Honorable Eric Swalwell
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