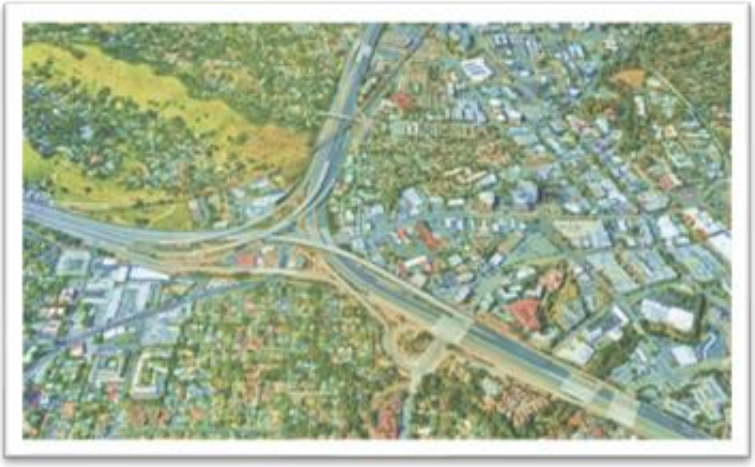
Interstate 680 Northbound Express Lane Completion Project

CONTRA COSTA COUNTY, CALIFORNIA
04-CC-680 (PM R10.7/23.1)
EA 04-0Q3100/Project ID 0418000070

Final Environmental Impact Report / Environmental Assessment with Finding of No Significant Impact



Prepared by the
State of California, Department of Transportation, and
Contra Costa Transportation Authority

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 dated May 27, 2022, and executed by FHWA and Caltrans.

Caltrans

CONTRA COSTA transportation authority

October 2025

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General Information About This Document

The California Department of Transportation (Caltrans), as assigned by the Federal Highway Administration (FHWA), has prepared this Final Environmental Impact Report/Environmental Assessment (EIR/EA) with Finding of No Significant Impact for the proposed Interstate 680 (I-680) Northbound Express Lane Completion Project (Project) located in Contra Costa County, California. Caltrans is the lead agency under the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA). The document tells you why the Project is being proposed, what alternatives have been considered for the Project, the alternative selected after consideration of the comments received on the Draft EIR/EA, how the existing environment could be affected by the Project, the potential impacts of each of the alternatives, and the proposed avoidance, minimization, and/or mitigation measures.

The Draft EIR/EA was circulated to the public for 47 days between May 8 and June 24, 2024. Comments received during this period are included in Appendix G, *Comment Letters and Responses*. Elsewhere throughout this document, a vertical line in the margin indicates a change was made since the draft document circulation. Minor editorial changes and clarifications have not been so indicated.

This document may be downloaded at the following website: ccta.net/expresslane. Additional copies of this document and the related technical studies are available at Caltrans District 4, Office of Environmental Analysis, 111 Grand Avenue, Oakland, CA 94612 and Contra Costa Transportation Authority, 2999 Oak Road # 100, Walnut Creek, CA 94597.

Alternative Formats:

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 Wahida Rashid, Caltrans Senior Environmental Planner, Caltrans District 4, Office of Environmental Analysis, Mail Station 8B, P.O. Box 23660, Oakland, CA 94623-0660; (925) 278-5978 (Voice); or use the California Relay Service 1 (800) 735-2929 (TTY to Voice), 1 (800) 735-2922 (Voice to TTY), 1 (800) 855-3000 (Spanish TTY to Voice and Voice to TTY), 1-800-854-7784 (Spanish and English Speech-to-Speech), or 711.

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SCH #: 2020060297
04-CC-680 – PM R10.7/23.1
EA: 04-0Q3100
Project No. 0418000070

Modify Northbound Interstate 680 from Livorna Road to South of the Benicia-Martinez Bridge Toll Plaza (Post Miles R10.7 to 23.1) in Contra Costa County, California.

Final Environmental Impact Report / Environmental Assessment with Finding of No Significant Impact

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

THE STATE OF CALIFORNIA
Department of Transportation,
and
Contra Costa Transportation Authority

Responsible Agencies: California Transportation Commission, California Department of Fish and Wildlife, and Metropolitan Transportation Commission

David Ambuehl

10/31/2025

David D. Ambuehl
Acting District Director
California Department of Transportation District 4
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Date

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CALIFORNIA DEPARTMENT OF TRANSPORTATION
FINDING OF NO SIGNIFICANT IMPACT (FONSI)

FOR

Interstate 680 Northbound Express Lane Completion Project

The California Department of Transportation (Caltrans) has determined that Build Alternative 2 (Reduce the Gap Plus Braided Ramps) will have no significant impact on the human environment. This FONSI is based on the attached joint Environmental Impact Report (EIR)/Environmental Assessment (EA) which has been independently evaluated by Caltrans and determined to adequately and accurately discuss the need, environmental issues, and impacts of the proposed project and appropriate mitigation measures. It provides sufficient evidence and analysis for determining that an Environmental Impact Statement is not required. Caltrans takes full responsibility for the accuracy, scope, and content of the attached EIR/EA.

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 dated May 27, 2022, and executed by FHWA and Caltrans.

David Ambuehl

David D. Ambuehl
Acting District Director
California Department of
Transportation District 4

10/31/2025

Date

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Summary

Introduction

The proposed Interstate 680 (I-680) Northbound Express Lane Completion Project (Project) is a joint project by the California Department of Transportation (Caltrans or Department) and the Federal Highway Administration (FHWA) and is subject to state and federal environmental review requirements. Project documentation, therefore, has been prepared in compliance with both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). Caltrans is the lead agency under NEPA. Caltrans is the lead agency under CEQA. In addition, 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 United States Code (USC) Section 327 and the Memorandum of Understanding dated May 27, 2022, and executed by FHWA and Caltrans.

Some impacts determined to be significant under CEQA may not lead to a determination of significance under NEPA. Because NEPA is concerned with the significance of the Project as a whole, often a "lower level" document is prepared for NEPA. One of the most common joint document types is an Environmental Impact Report/Environmental Assessment (EIR/EA).

The Draft EIR/EA was circulated to the public for 47 days between May 8 and June 24, 2024. Comments received during this period are included in Appendix G, *Comments and Responses*. Elsewhere throughout this document, a vertical line in the margin indicates a change made since the draft document circulation. Minor editorial changes and clarifications have not been indicated as such.

After receiving comments from the public and reviewing agencies, the Project Development Team (PDT) selected Alternative 2 (Reduce the Gap Plus Braided Ramps) as the preferred alternative on September 10, 2024. Under CEQA, Caltrans will certify that the Project complies with CEQA, prepare findings for all significant impacts identified, prepare a Statement of Overriding Considerations for impacts that will not be mitigated below a level of significance, and certify that the findings and Statement of Overriding Considerations have been considered prior to Project approval. If the decision is made to approve the Project, a Notice of Determination will be published for compliance with CEQA, and a Notice of Availability for the Finding of No Significant Impact (FONSI) will be sent to the affected units of federal, state, and local government, and to the State Clearinghouse in compliance with Executive Order (EO) 12372.

NEPA ASSIGNMENT

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 May 27, 2022, for a term of ten years. In summary, the Department continues to assume FHWA responsibilities under NEPA and other federal environmental laws in the same manner as was 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 Secretary's responsibilities under NEPA. This assignment includes projects on the State Highway System and Local Assistance Projects off 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.

OVERVIEW OF PROJECT AREA

I-680 is a major north-south freeway that passes through Santa Clara, Alameda, Contra Costa, and Solano Counties. The Project is located in Contra Costa County, within the cities of Walnut Creek, Pleasant Hill, Concord, and Martinez and the communities of Alamo, Acalanes Ridge, Pacheco, and Waldon.

On I-680, the Project's post mile (PM) limits are from PM R10.7 at the southern limit to PM 23.1 at the northern limit, which encompasses the operational improvement area for the Project. The Project Study Limits, which include all potential work areas for the Project, are from just south of Stone Valley Road (PM R10.0) to north of Arthur Road (PM 23.2). The Project Study Limits are within the cities of San Ramon, Danville, Walnut Creek, Pleasant Hill, Concord, and Martinez and the community of Alamo in Contra Costa County, California. The total Project length is approximately 13.2 miles.

Several transportation improvement projects are currently underway within the Project Study Limits, which are assumed to be in place prior to construction of the Project. This includes the following:

- *I-680/State Route (SR) 4 Interchange Improvements Project, Phases 1, 2a, and 4 (EA 04-22914):* This project will construct a phased sequence of improvements to the I-680/SR-4 interchange in Contra Costa County. The project is being delivered in five phases. Phase 3, which widens SR-4, was constructed in 2021. Phases 1, 2a, and 4 are in final design. Full funding has been secured for construction of Phases 2a and 4, which is anticipated to start in 2026.

- *I-680 Ramp Metering (EA 04-1Q720K):* As part of the State Highway Operation and Protection Program, Caltrans is planning to install ramp metering equipment and ramp improvements along I-680 from I-580 through Contra Costa County. The project is currently in the final design phase with construction anticipated to start in 2025.

- *INNOVATE 680 Coordinated Adaptive Ramp Metering (EA 04-0Q960):* The project will implement an adaptive ramp metering system on northbound I-680 between Alcosta Boulevard and Olympic Boulevard (Segment 1), and a future phase will expand that to both directions of I-680 in Contra Costa County to proactively manage recurrent and non-recurrent congestion. The project is currently in the final design phase with construction anticipated to start in 2027.

- *Part Time Transit Lane:* This project will enable buses to travel on the right shoulder (or transit-only lanes) to bypass congestion during periods of heavy traffic. The Project Initiation Documents phase was completed in 2023, and testing of Part Time Transit Lane operations at GoMentum Station is anticipated to start in 2025.

- *Civil Infrastructure for Open Road Tolling Conversion (EA 04-2W520):* The Bay Area Toll Authority, in coordination with Caltrans, will convert existing toll facilities to open road tolling systems at the Antioch Bridge, Benicia-Martinez Bridge, and Carquinez Bridge toll facilities. These systems allow motorists to pay tolls without slowing down at toll booths. The project is anticipated to be in the final design phase in 2025 with construction anticipated to start in 2026.

For a more complete description of proposed projects in the Project vicinity, refer to Section 2.4, *Cumulative Impacts*.

Within the Project Study Limits, I-680 is a divided freeway separated by a concrete median barrier. Southbound I-680 has an existing express lane. Northbound I-680 currently has an express lane from Alameda County (i.e., south of Alcosta Boulevard) to Livorna Road and a high-occupancy vehicle (HOV) lane from north of the SR-242 junction to south of the Benicia-Martinez Bridge.

PROPOSED PROJECT

The Contra Costa Transportation Authority (CCTA), in cooperation with Caltrans, is proposing to complete the I-680 express lane network in Contra Costa County, California, to improve system continuity, congestion relief, and operations.

The purpose of the Project is to reduce peak-period congestion and delay on northbound I-680; reduce travel time and improve travel time reliability for travelers in the corridor; encourage use of HOV and transit services; optimize use of the existing HOV lane capacity in the I-680 corridor to better meet current and future traffic demands; and offer non-carpool eligible drivers a reliable travel time option.

The Project is needed to address existing transportation problems within the Project Study Limits related to congestion, system continuity, and operation improvements. Northbound I-680 general-purpose lanes experience substantial congestion (over 30 minutes of delay) during peak hours. There is also a 7.5-mile gap in the existing northbound I-680 managed lane system between Livorna Road and SR-242. System continuity is lacking through this area, diminishing the effectiveness of the managed

lane system and increasing travel time for all users. There is also weaving movement between Lawrence Way and Treat Boulevard that creates a bottleneck on I-680 and a traffic queue as far back as Livorna Road during the peak traffic period.

The following alternatives are considered in this environmental document:

- *Build Alternative 1C*: Add an express lane on northbound I-680 from Livorna Road to SR-242, realign southbound I-680 through the SR-24 Interchange, and convert the existing HOV lane to an express lane from SR-242 to the Arthur Road on-ramp.

- *Build Alternative 2 (Selected Alternative)*: Add an express lane on northbound I-680 from Livorna Road to SR-242 with a two-mile gap through the SR-24 Interchange, construct braided ramps between the Lawrence Way on-ramp and Treat Boulevard off-ramp, and convert the existing HOV lane to an express lane from SR-242 to the Arthur Road on-ramp.

- *Build Alternative 3*: Add an express lane on northbound I-680 from Livorna Road to SR-242, realign southbound I-680 through the SR-24 Interchange, construct braided ramps between the Lawrence Way on-ramp and Treat Boulevard off-ramp, and convert the existing HOV lane to an express lane from SR-242 to the Arthur Road on-ramp.

- *Build Alternative 5*: Convert the inside general-purpose lane to an express lane from south of North Main Street to SR-242, construct braided ramps between the Lawrence Way on-ramp and Treat Boulevard off-ramp, and convert the existing HOV lane to an express lane from SR-242 to the Arthur Road on-ramp. Unlike Alternatives 1C, 2, and 3, this Build Alternative would not add any new lanes on I-680.

- *No-Build Alternative*: I-680 remains in its current configuration, and no improvements would be implemented.

Selection of the Preferred Alternative

This environmental document evaluates the potential effects of the No-Build Alternative and four Build Alternatives (Alternatives 1C, 2, 3, and 5). After comparing and weighing the benefits and impacts of all feasible alternatives, the PDT has identified Alternative 2 as the preferred alternative because Alternative 2 would provide the most operational benefits on I-680 and would not deteriorate traffic operations on SR-24.

The Project would result in the following traffic operational benefits compared to the No-Build Alternative for the Design Year (2047), which are described in more detail in Section 2.1.8, *Traffic and Transportation/Pedestrian and Bicycle Facilities*:

- Improve freeway segment speeds on northbound I-680 in the afternoon peak period;

- Substantially improve travel time in general purpose and managed lanes on northbound I-680;
- Improve vehicle hours of delay (VHD) on northbound I-680;
- Improve freeway segment level of service on northbound I-680;
- Improve VHD in the morning peak period on SR-24.

Among the four Build Alternatives evaluated, Alternative 2 would provide the most overall operational benefits and best meets the Project's purpose and need. Alternative 2 is a feasible and prudent alternative that would reduce peak-period congestion and delay on northbound I-680, encourage use of HOV and transit services, offer non-carpool eligible drivers a reliable travel time option, optimize use of the existing HOV lane capacity in the I-680 corridor to better meet current and future traffic demands, and reduce travel time and improve travel time reliability for travelers in the corridor.

Additional reasons why Alternative 2 was selected as the preferred alternative include the following:

- Unlike all other Build Alternatives evaluated, Alternative 2 would substantially improve freeway segment speeds, travel time, VHD, and vehicle and person throughput on I-680 during the afternoon peak period in the Design Year.
- Unlike all other Build Alternatives evaluated, Alternative 2 would not deteriorate and would substantially improve VHD on SR-24 during the afternoon peak period in the Design Year.
- Alternative 2 would improve freeway segment speeds, travel time, and VHD on I-680 during the morning peak period in the Design Year. Alternative 5 would deteriorate all of these metrics.
- Alternative 2 would require less right-of-way (ROW) than Alternatives 1C and 3. Unlike Alternatives 1C and 3, Alternative 2 would not require permanent or temporary ROW from private property.
- Alternative 2 would require fewer design exceptions than Alternatives 1C and 3, indicating increased likelihood for constructability.
- Unlike Alternatives 1C and 3, Alternative 2 would not include an 11-month closure of Olympic Boulevard and would have fewer overnight closures than Alternatives 1C and 3.
- Unlike Alternatives 1C and 3, Alternative 2 would not require the replacement of existing soundwalls and construction of new soundwalls at the SR-24 Interchange (i.e., Noise Barrier System 5/24-RW2/SW No.1/24-RW4).

- Unlike Alternative 3, Alternative 2 would not result in a deficit of post-construction treatment areas.
- The capital and mitigation costs of Alternative 2 would be less than Alternatives 1C and 3.
- Alternative 2 would result in fewer vehicle miles traveled (VMT) and require less mitigation than Alternatives 1C and 3.
- Of the 81 comments received on the Draft EIR/EA, 32 opposed the conversion of a general-purpose lane without adding capacity (i.e., Alternative 5).

Alternative 5 was not selected as the preferred alternative due to the number of comments received from the public and elected officials opposing the conversion of a general-purpose lane to an express lane during the Draft EIR/EA public comment period as well as the projected increase in VHD on I-680 in the morning peak period compared to the No-Build Alternative, the projected deterioration of traffic on SR-24 compared to the No-Build Alternative, and other concerns raised regarding traffic impacts and constructability.

PROJECT IMPACTS

Table S-1 summarizes the effects of each Build Alternative compared to the No-Build Alternative. The proposed avoidance, minimization, and/or mitigation measures to reduce the effects of the Build Alternatives are presented in Table S-2. A complete description of the Project's environmental consequences and avoidance, minimization and mitigation measures are provided in Chapter 2 of this environmental document.

After consideration of the impacts of the Project as a whole, including the comments received on the Draft EIR/EA, Caltrans has determined that Build Alternative 2 (Reduce the Gap Plus Braided Ramps) would have no significant impact on the human environment. Therefore, an environmental impact statement is not required. When the final agency decision has been made to approve the Project, a Notice of Availability for the FONSI will be sent to the affected units of federal, state, and local governments and to the State Clearinghouse in compliance with EO 12372.

Table S-1. Summary of Impacts

Affected Resource	Potential Impact				
	No-Build Alternative	**Alternative 1C**	**Alternative 2 (Preferred Alternative)**	**Alternative 3**	**Alternative 5**
Existing and Future Land Use	None	Alternative 1C would require temporary construction easements (TCE; 0.44 acre), permanent easements (0.67 acre), and partial fee acquisitions (0.05 acre). No full acquisitions would be required. Right-of-way (ROW) acquisitions would not affect the land use designation or zoning for the remainder of the properties. No permanent change to land use would result.	Alternative 2 would require TCEs (0.59 acre) and partial fee acquisitions (0.50 acre). No full acquisitions or permanent easements would be required. ROW acquisitions would not affect the land use designation or zoning for the remainder of the properties. No permanent change to land use would result.	Alternative 3 would require TCEs (0.63 acre), permanent easements (0.67 acre), and partial fee acquisitions (0.53 acre). No full acquisitions would be required. ROW acquisitions would not affect the land use designation or zoning for the remainder of the properties. No permanent change to land use would result.	Alternative 5 would require temporary construction easements (0.19 acre) and partial acquisitions (0.47 acre). No full acquisitions or permanent easements would be required. ROW acquisitions would not affect the land use designation or zoning for the remainder of the properties. No permanent change to land use would result.
Consistency with State, Regional, and	The No-Build Alternative would be inconsistent with *Plan Bay Area 2050*	Alternative 1C would be generally consistent with all applicable state,	Same as Alternative 1C	Same as Alternative 1C	Same as Alternative 1C

Affected Resource	Potential Impact				
	No-Build Alternative	**Alternative 1C**	**Alternative 2 (Preferred Alternative)**	**Alternative 3**	**Alternative 5**
Local Plans and Programs	and the Measure J Expenditure Plan because it would not contribute to the Regional Express Lanes Network	regional, and local plans and programs. Coordination with local and regional agencies would continue in accordance with Measure **CIA-1**.			
Coastal Zone	None	None	None	None	None
Wild and Scenic Rivers	None	None	None	None	None
Parks and Recreational Facilities	None	Alternative 1C would require a temporary detour and permanent shift of the Iron Horse Regional Trail under the Rudgear Road Undercrossing Bridge. Measures **PR-1** through **PR-3** would be implemented, which would minimize and avoid impacts on parks and	Alternative 2 would require a temporary detour and permanent shift of the Iron Horse Regional Trail under the Rudgear Road Undercrossing Bridge, and a temporary detour of the Costa Canal Trail/Briones to Mount Diablo Regional Trail at the Contra Costa Canal Undercrossing	Alternative 3 would require a temporary detour and permanent shift of the Iron Horse Regional Trail under the Rudgear Road Undercrossing Bridge, and a temporary detour of the Costa Canal Trail/Briones to Mount Diablo Regional Trail at the Contra Costa Canal Undercrossing	Alternative 5 would require a temporary detour of the Costa Canal Trail/Briones to Mount Diablo Regional Trail at the Contra Costa Canal Undercrossing Bridge during construction. Measures **PR-1** and **PR-2** would be implemented, which would minimize and avoid impacts on parks and

Affected Resource	Potential Impact				
	No-Build Alternative	**Alternative 1C**	**Alternative 2 (Preferred Alternative)**	**Alternative 3**	**Alternative 5**
		recreational facilities.	Bridge during construction. Measures **PR-1** through **PR-3** would be implemented, which would minimize and avoid impacts on parks and recreational facilities.	Bridge during construction. Measures **PR-1** through **PR-3** would be implemented, which would minimize and avoid impacts on parks and recreational facilities.	recreational facilities.
Farmlands	None	None	None	None	None
Timberlands	None	None	None	None	None
Growth	None	Alternative 1C would increase the capacity of Interstate 680 (I-680) but would not influence the rate, type, or amount of growth that would otherwise occur.	Same as Alternative 1C	Same as Alternative 1C	Alternative 5 would not increase capacity of I-680 or influence the rate, type, or amount of growth that would otherwise occur.
Community Character and Cohesion	Local and regional priorities would not be addressed.	Alternative 1C would reduce congestion on I-680. Alternative 1C	Same as Alternative 1C. However, Alternative 2 includes an	Same as Alternative 2	Same as Alternative 2

Affected Resource	Potential Impact				
	No-Build Alternative	**Alternative 1C**	**Alternative 2 (Preferred Alternative)**	**Alternative 3**	**Alternative 5**
		would not impact existing or forecasted population levels, housing substantially, or community character or cohesion. Alternative 1C would require TCEs, permanent easements, and partial acquisition of ROW. Appraisals and acquisition of ROW would be conducted in accordance with any applicable requirements of the Uniform Relocation Assistance Program (**CIA-2**).	additional commitment to work with City of Walnut Creek to minimize impacts on the City's Corporation Yard (511 Lawrence Way; **CIA-3**).		
Relocations and Real Property Acquisitions	None	Alternative 1C would require an 805-foot TCE from one private parcel. Alternative 1C	Alternative 2 would not require any temporary or permanent ROW from private	Same as Alternative 1C	Same as Alternative 2

Affected Resource	Potential Impact				
	No-Build Alternative	**Alternative 1C**	**Alternative 2 (Preferred Alternative)**	**Alternative 3**	**Alternative 5**
		would not require the full acquisition of any property nor would it result in the relocation or displacement of any home or business.	property. Alternative 2 is not anticipated to result in the relocation or displacement of any home or business.		
Utilities/ Emergency Services	None	The relocation of electrical facilities may result in temporary interruptions of utility services. Implementation of Measures **UES-1** through **UES-3** would minimize and avoid impacting utility or emergency services during construction. Alternative 1C would not result in long-term effects on utilities or emergency services.	Same as Alternative 1C	Same as Alternative 1C	Same as Alternative 1C
Traffic and Transportation	As traffic demand increases, traffic operations along	Alternative 1C would improve overall operations on I-680	Alternative 2 would improve overall operations on I-680	Alternative 3 would improve overall operations on I-680	Alternative 5 would improve overall operations on I-680

Affected Resource	Potential Impact				
	No-Build Alternative	**Alternative 1C**	**Alternative 2 (Preferred Alternative)**	**Alternative 3**	**Alternative 5**
	northbound I-680 would further deteriorate, resulting in increased congestion and vehicle delay. Vehicle miles traveled (VMT) is an impact criterion for CEQA. Daily VMT is anticipated to continue to increase by the Design Year resulting in increased emissions and reduced mobility.	compared to the No-Build condition for both the morning and afternoon peak periods. Alternative 1C would result in 99,389 more daily VMT (without trucks) than the No-Build Alternative in the Design Year. Mitigation Measures **TRAN-MM-1**, **TRAN-MM-2**, and **TRAN-MM-3** would be in place to reduce VMT. However, VMT impacts would individually and cumulatively continue to be a significant and unavoidable impact under CEQA.	compared to the No-Build condition for both the morning and afternoon peak periods. Alternative 2 would result in 82,353 more daily VMT (without trucks) than the No-Build Alternative in the Design Year. Mitigation Measures **TRAN-MM-1**, **TRAN-MM-2**, and **TRAN-MM-3** would be in place to reduce VMT. However, VMT impacts would individually and cumulatively continue to be a significant and unavoidable impact under CEQA.	compared to the No-Build condition for both the morning and afternoon peak periods. Alternative 3 would result in 99,986 more daily VMT (without trucks) than the No-Build Alternative in the Design Year. Mitigation Measures **TRAN-MM-1**, **TRAN-MM-2**, and **TRAN-MM-3** would be in place to reduce VMT. However, VMT impacts would individually and cumulatively continue to be a significant and unavoidable impact under CEQA.	compared to the No- Build condition for the afternoon peak period but would increase travel time and delay in the morning peak period. Caltrans screened Alternative 5 from requiring VMT analysis and mitigation under CEQA. Alternative 5 would result in a less than significant impact under CEQA and mitigation is not required.
Pedestrian and Bicycle Facilities	None	Alternative 1C would require a temporary detour	Alternative 2 would require a temporary detour and	Alternative 3 would require a temporary detour and	Alternative 5 would require a temporary detour of the Costa

Affected Resource	Potential Impact				
	No-Build Alternative	**Alternative 1C**	**Alternative 2 (Preferred Alternative)**	**Alternative 3**	**Alternative 5**
		and permanent shift of the Iron Horse Regional Trail under the Rudgear Road Undercrossing Bridge. Measures **PR-1** through **PR-3** would reduce potential impacts on pedestrian and bicycle facilities during construction.	permanent shift of the Iron Horse Regional Trail under the Rudgear Road Undercrossing Bridge and a temporary detour of the Costa Canal Trail/Briones to Mount Diablo Regional Trail at the Contra Costa Canal Undercrossing Bridge. Measures **PR-1** through **PR-3** would reduce potential impacts on pedestrian and bicycle facilities during construction.	permanent shift of the Iron Horse Regional Trail under the Rudgear Road Undercrossing Bridge and a temporary detour of the Costa Canal Trail/Briones to Mount Diablo Regional Trail at the Contra Costa Canal Undercrossing Bridge. Measures **PR-1** through **PR-3** would reduce potential impacts on pedestrian and bicycle facilities during construction.	Canal Trail/Briones to Mount Diablo Regional Trail at the Contra Costa Canal Undercrossing Bridge. Measures **PR-1** through **PR-3** would reduce potential impacts on traffic and transportation and pedestrian and bicycle facilities during construction.
Visual/ Aesthetics	None	Segments of I-680 and SR-24 within the Visual Resources Study Area are officially designated state scenic highways. With the introduction of new soundwalls, ramps,	Same as Alternative 1C	Same as Alternative 1C	Same as Alternative 1C

Affected Resource	Potential Impact				
	No-Build Alternative	**Alternative 1C**	**Alternative 2 (Preferred Alternative)**	**Alternative 3**	**Alternative 5**
		and signage, Alternative 1C would have moderate to high visual impact. Measures **VIS-1** through **VIS-5**, **BIO-GEN-10**, and **BIO-MM-1** would minimize and avoid impacting visual/aesthetic resources.			
Cultural Resources	None	The records search identified 14 resources within the area of potential effect, including 3 prehistoric (archaeological) sites and 11 built environment resources. Alternative 1C was designed to avoid impacting known cultural resources. Ground-disturbing activities during	Same as Alternative 1C	Same as Alternative 1C	Same as Alternative 1C

Affected Resource	Potential Impact				
	No-Build Alternative	**Alternative 1C**	**Alternative 2 (Preferred Alternative)**	**Alternative 3**	**Alternative 5**
		construction could affect unknown buried cultural resources. Measures **CUL-1** through **CUL-2** would be implemented should unanticipated cultural resources or human remains be discovered during construction.			
Hydrology and Floodplain	None	Alternative 1C would not result in a longitudinal floodplain encroachment nor would it support incompatible floodplain development. There is a potential Best Management Practice treatment in proximity to a floodplain. With implementation of Measures **HYD-1**, **WQ-1** through **WQ-4**,	Same as Alternative 1C	Same as Alternative 1C	Same as Alternative 1C

Affected Resource	Potential Impact				
	No-Build Alternative	**Alternative 1C**	**Alternative 2 (Preferred Alternative)**	**Alternative 3**	**Alternative 5**
		BIO-GEN-1 through **BIO-GEN-16, BIO-PLANTS-1, BIO-TURTLE-1**, **BIO-FWS-1** through **BIO-FWS-4** impacts on floodplains would be minimized or avoided.			
Water Quality and Storm Water Runoff	None	Alternative 1C would disturb 30.83 acres of soil. Alternative 1C would permanently add 12.84 acres of net new impervious surface area, which includes new and replaced impervious surface area. The Project would comply with standard practices to reduce impacts on water quality and would be in compliance with National Pollutant Discharge Elimination System	Alternative 2 would disturb 24.41 acres of soil. Alternative 2 would permanently add 9.06 acres of net new impervious surface area. The Project would comply with standard practices to reduce impacts on water quality and would be in compliance with NPDES. With implementation of Measures **WQ-1** through **WQ-4**, no substantial adverse	Alternative 3 would disturb 37.24 acres of soil. Alternative 3 would permanently add 16.27 acres of net new impervious surface area. The Project would comply with standard practices to reduce impacts on water quality and would be in compliance with NPDES. With implementation of Measures **WQ-1** through **WQ-4**, no substantial adverse	Alternative 5would disturb 10.65 acres of soil. Alternative 5 would permanently add 2.93 acres of net new impervious surface area. The Project would comply with standard practices to reduce impacts on water quality and would be in compliance with NPDES. With implementation of Measures **WQ-1** through **WQ-4**, no substantial adverse

Affected Resource	Potential Impact				
	No-Build Alternative	**Alternative 1C**	**Alternative 2 (Preferred Alternative)**	**Alternative 3**	**Alternative 5**
		(NPDES). With implementation of Measures **WQ-1** through **WQ-4**, no substantial adverse impacts are anticipated to occur.	impacts are anticipated to occur.	impacts are anticipated to occur.	impacts are anticipated to occur.
Geology/ Soils/ Seismic/ Topography	None	Construction activities could be affected indirectly by ground motion, liquefaction and lateral spreading, and potential ground deformation if an earthquake event were to occur during construction. Standard practices relating to Geotechnical Design Standards, **GEO-1**, and **HAZ-6** would be implemented. No substantial impacts are anticipated.	Same as Alternative 1C	Same as Alternative 1C	Same as Alternative 1C
Paleontology	None	Construction activities have the	Same as Alternative 1C	Same as Alternative 1C	Same as Alternative 1C

Affected Resource	Potential Impact				
	No-Build Alternative	**Alternative 1C**	**Alternative 2 (Preferred Alternative)**	**Alternative 3**	**Alternative 5**
		potential to encounter native sediments with high paleontological potential, both at the surface and in the subsurface beneath low sensitivity deposits and artificial fill. Measure **PAL-1** would be implemented, which would avoid impacting significant paleontological resources.			
Hazardous Waste/ Materials	None	Construction could result in the potential disturbance of hazardous materials in the soil and groundwater. Measures **HAZ-2** through **HAZ-6** would avoid or minimize adverse effects with known or suspected hazardous materials and wastes during construction. No long-term impacts	Construction could result in the potential disturbance of hazardous materials in the soil and groundwater. Unlike Alternative 1, Alternative 2 would require ROW at one parcel with a recognized environmental condition (511 Lawrence Way). Measures **HAZ-1**	Same as Alternative 2.	Same as Alternative 2.

Affected Resource	Potential Impact				
	No-Build Alternative	**Alternative 1C**	**Alternative 2 (Preferred Alternative)**	**Alternative 3**	**Alternative 5**
		are expected to occur.	through **HAZ-6** would avoid or minimize adverse effects with known or suspected hazardous materials and wastes during construction. No long-term impacts are expected to occur.		
Air Quality	None	Alternative 1C would increase the capacity of I-680. Alternative 1C is not a Project of Air Quality Concern (POAQC) for Project-level conformity. Alternative 1C would result in slightly higher or lower (i.e., less than one percent) long-term operational emissions of criteria air pollutants and mobile source air toxics (MSAT) compared to the	Impacts would be similar to Alternative 1C. The Federal Highway Administration determined that Alternative 2 (preferred alternative) would meet regional conformity.	Impacts would be similar to Alternative 1C.	Alternative 5 would not increase the capacity of I-680. Alternative 5 is not a POAQC. Alternative 5 would result in slightly lower carbon monoxide (CO) and fine particulate matter ($PM_{2.5}$), lower particulate matter with a diameter of 10 micrometers or smaller (PM_{10}), slightly higher reactive organic gases (ROG), and lower nitrogen oxides (NOx), than

Affected Resource	Potential Impact				
	No-Build Alternative	**Alternative 1C**	**Alternative 2 (Preferred Alternative)**	**Alternative 3**	**Alternative 5**
		No-Build for the Design Year. Short-term air quality impacts would not be substantial and are expected to be localized around construction activities. Measures **AQ-1** through **AQ-7** and **HAZ-2** and **HAZ-3** would be implemented to reduce construction emissions.			the No-Build. In addition, Acetaldehyde would be higher than the No-Build; diesel particulate matter would be lower than the No-Build; and polycyclic organic matter would be higher than the No-Build. Short-term air quality impacts would not be substantial and are expected to be localized around construction activities. Measures **AQ-1** through **AQ-7** and **HAZ-2** and **HAZ-3** would be implemented to reduce construction emissions.
Noise and Vibration	None	Alternative 1C would not substantially increase future	Alternative 2 would not substantially increase future noise levels. Noise	Alternative 3 would not substantially increase future noise levels. Noise	Alternative 5 would not substantially increase future noise levels. Noise

Affected Resource	Potential Impact				
	No-Build Alternative	**Alternative 1C**	**Alternative 2 (Preferred Alternative)**	**Alternative 3**	**Alternative 5**
		noise levels. Noise abatement is being considered because projected highway noise levels are expected to approach or exceed the noise abatement criteria (NAC) at multiple locations. Caltrans intends to incorporate noise abatement by replacing existing soundwalls in-kind at Noise Barrier System E.1/SW No. 4/M242-RW1/E.3/SW No. 3 and Noise Barrier System 5/24-RW2/SW No.1/24-RW4. Caltrans also intends to construct a new soundwall (Barrier 2). Caltrans would also replace an existing soundwall north of Rudgear Road (RSM-RW2). Construction noise for all receptors would be short-term	abatement is being considered because projected highway noise levels are expected to approach or exceed the NAC at multiple locations. Caltrans intends to incorporate noise abatement by replacing Noise Barrier System E.1/SW No. 4/M242-RW1/E.3/SW No. 3 and Noise Barrier System 5/24-RW2/SW No.1/24-RW4. Caltrans also intends to construct a new soundwall (Barrier 2). Caltrans would also replace an existing soundwall north of Rudgear Road (RSM-RW2). Construction noise for all receptors would be short-term and intermittent. Construction activities have the	abatement is being considered because projected highway noise levels are expected to approach or exceed the NAC at multiple locations. Caltrans intends to incorporate noise abatement by replacing existing soundwalls in-kind at Noise Barrier System E.1/SW No. 4/M242-RW1/E.3/SW No. 3 and Noise Barrier System 5/24-RW2/SW No.1/24-RW4. Caltrans also intends to construct a new soundwall (Barrier 2). Caltrans would also replace an existing soundwall north of Rudgear Road (RSM-RW2). Construction noise for all receptors would be short-term and intermittent. Construction	abatement is being considered because projected highway noise levels are expected to approach or exceed the NAC at multiple locations. Caltrans intends to construct a new soundwall (Barrier 2). Construction noise for all receptors would be short-term and intermittent. Construction activities have the potential to temporarily increase noise levels at St. Mary School, Futures Academy, Las Lomas High School, and Dorris-Eaton School. Measure **NOI-1** would be implemented to reduce the potential temporary noise impacts.

Affected Resource	Potential Impact				
	No-Build Alternative	Alternative 1C	Alternative 2 (Preferred Alternative)	Alternative 3	Alternative 5
		and intermittent. Construction activities have the potential to temporarily increase noise levels at St. Mary School, Futures Academy, Las Lomas High School, and Dorris-Eaton School. Measure **NOI-1** would be implemented to reduce the potential temporary noise impacts. Vibration levels from proposed wall RSM-RW2 could potentially impact residential apartment buildings at Near Court and Creekside Drive. Measure **VIB-1** would be implemented to reduce the potential temporary vibration impacts.	potential to temporarily increase noise levels at St. Mary School, Futures Academy, Las Lomas High School, and Dorris-Eaton School. Measure **NOI-1** would be implemented to reduce the potential temporary noise impacts. Vibration levels from proposed wall RSM-RW2 could potentially impact residential apartment buildings at Near Court and Creekside Drive and industrial structures adjacent to Lawrence Way Northbound on-ramp. Measure **VIB-1** would be implemented to reduce the potential temporary vibration impacts.	activities have the potential to temporarily increase noise levels at St. Mary School, Futures Academy, Las Lomas High School, and Dorris-Eaton School. Measure **NOI-1** would be implemented to reduce the potential temporary noise impacts. Vibration levels from proposed wall RSM-RW2 could potentially impact residential apartment buildings at Near Court and Creekside Drive and industrial structures adjacent to Lawrence Way Northbound on-ramp. Measure **VIB-1** would be implemented to reduce the potential temporary vibration impacts.	Vibration levels could potentially impact industrial structures adjacent to Lawrence Way Northbound on-ramp. Measure **VIB-1** would be implemented to reduce the potential temporary vibration impacts.

Affected Resource	Potential Impact				
	No-Build Alternative	**Alternative 1C**	**Alternative 2 (Preferred Alternative)**	**Alternative 3**	**Alternative 5**
Energy	None	Alternative 1C would reduce traffic congestion along I-680 and yield energy savings compared to the No-Build. It is anticipated that energy expenditures required to construct the Project would be partially offset by long-term operational reductions in energy consumption. Measures **E-1** through **E-3** would be sufficient to minimize energy use and consumption.	Same as Alternative 1C	Same as Alternative 1C	Same as Alternative 1C
Natural Communities	None	Alternative 1C would permanently impact less than 0.01 acre of arroyo willow thicket, 0.16 acre of coast live oak woodland, and 0.51 acre of non-native woodland. Alternative 1C would impact approximately 114 native and 117	Alternative 2 would permanently impact the same number of acres as Alternative 1C of arroyo willow thicket, coast live oak woodland, and non-native woodland. Alternative 2 would impact approximately 107 native and 161	Alternative 3 would permanently impact the same number of acres as Alternative 1C of arroyo willow thicket, coast live oak woodland, and non-native woodland. Alternative 3 would impact the same number of native and	Alternative 5 would not impact arroyo willow thicket, coast live oak woodland, or non-native woodland. Alternative 5 would impact approximately 65 native and 127 non-native trees. No impacts on fish passage or wildlife

Affected Resource	Potential Impact				
	No-Build Alternative	**Alternative 1C**	**Alternative 2 (Preferred Alternative)**	**Alternative 3**	**Alternative 5**
		non-native trees. No impacts on fish passage or wildlife movement would occur. General biological resources measures (**BIO-GEN-1** through **BIO-GEN-16**) and measure **BIO-MM-1** would be sufficient to avoid and minimize impacting natural communities.	non-native trees. No impacts on fish passage or wildlife movement would occur. General biological resources measures (**BIO-GEN-1** through **BIO-GEN-16**) and measure **BIO-MM-1** would be sufficient to avoid and minimize impacting natural communities.	non-native trees as Alternative 2 (approximately 107 native and 161 non-native trees). No impacts on fish passage or wildlife movement would occur. General biological resources measures (**BIO-GEN-1** through **BIO-GEN-16**) and measure **BIO-MM-1** would be sufficient to avoid and minimize impacting natural communities.	movement would occur. General biological resources measures (**BIO-GEN-1** through **BIO-GEN-16**) and measure **BIO-MM-1** would be sufficient to avoid and minimize impacting natural communities.
Wetlands and Other Waters	None	Alternative 1C would temporarily impact approximately 0.26 acre of aquatic resources, which may fall within U.S. Army Corps of Engineers, Regional Water Quality Control Board, and/or California Department of Fish	Same as Alternative 1C.	Same as Alternative 1C.	Same as Alternative 1C.

Affected Resource	Potential Impact				
	No-Build Alternative	**Alternative 1C**	**Alternative 2 (Preferred Alternative)**	**Alternative 3**	**Alternative 5**
		and Wildlife jurisdiction. Alternative 1C would not impact wetlands or waters in the vicinity of McNabney Marsh. Mitigation Measure **BIO-MM-2** would be implemented to achieve no net loss of aquatic resources.			
Plant Species	None	Alternative 1C would impact approximately 1.55 acres of brome grassland, which is suitable habitat for the following special-status plant species: Congdon's tarplant (*Centromadia parryi ssp. Congdonii)*. General biological resources measures (**BIO-GEN-1** through **BIO-GEN-16**) and Measures **BIO-PLANTS-1** would be sufficient to avoid	Alternative 2 would impact approximately 1.73 acres of brome grassland, which is suitable habitat for the Congdon's tarplant. General biological resources measures (**BIO-GEN-1** through **BIO-GEN-16**) and Measures **BIO-PLANTS-1** would be sufficient to avoid impacts on special-status plant species.	Alternative 3, like Alternative 2, would impact approximately 1.73 acres of brome grassland, which is suitable habitat for the Congdon's tarplant. General biological resources measures (**BIO-GEN-1** through **BIO-GEN-16**) and Measures **BIO-PLANTS-1** would be sufficient to avoid impacts on special-status plant species.	Alternative 5 would impact approximately 0.37 acre of brome grassland, which is suitable habitat for the Congdon's tarplant. General biological resources measures (**BIO-GEN-1** through **BIO-GEN-16**) and Measures **BIO-PLANTS-1** would be sufficient to avoid impacts on special-status plant species.

Affected Resource	Potential Impact				
	No-Build Alternative	Alternative 1C	Alternative 2 (Preferred Alternative)	Alternative 3	Alternative 5
		impacting special-status plant species.			
Animal Species	None	Alternative 1C has the potential to affect habitat for the following special-status animal species: American badger (*Taxidea taxus*), Bridges' coast range shoulderband (*Helminthoglypta nickliniana bridgesi*), coast horned lizard (*Phrynosoma blainvillii*), obscure bumble bee (*Bombus caliginosus*), San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens)*, roosting bats, and nesting raptors and other nesting birds. General measures (**BIO-GEN-1** through **BIO-GEN-16**) and measures **BIO-**	Same as Alternative 1C.	Same as Alternative 1C.	Alternative 5 has the potential to affect habitat for the following special-status animal species: American badger, Bridges' coast range shoulderband, roosting bats, and nesting raptors and other nesting birds. General measures (**BIO-GEN-1** through **BIO-GEN-16**) and measures **BIO-BADGER-1**, **BIO-BAT-1**, **BIO-BAT-2**, **BIO-BEE-1**, **BIO-FALCON-1**, **BIO-KITE-1**, **BIO-HAWK-1**, **BIO-SNAIL-1**, **BIO-TURTLE-1**, **BIO-WOODRAT-1**, and **BIO-WOODRAT-2** would be sufficient to minimize or avoid

Affected Resource	Potential Impact				
	No-Build Alternative	**Alternative 1C**	**Alternative 2 (Preferred Alternative)**	**Alternative 3**	**Alternative 5**
		BADGER-1, **BIO-BAT-1**, **BIO-BAT-2**, **BIO-BEE-1**, **BIO-FALCON-1**, **BIO-KITE-1**, **BIO-HAWK-1**, **BIO-LIZARD-1**, **BIO-SNAIL-1**, **BIO-WOODRAT-1**, and **BIO-WOODRAT-2** would be sufficient to minimize or avoid impacting special-status animal species.			impacts on special-status animal species.
Threatened and Endangered Species	None	Alternative 1C would result in permanent and temporary impacts on suitable habitat for the following listed or candidate species: Alameda whipsnake (*Masticophis lateralis euryxanthus*), and California red-legged frog (*Rana draytonii*), and western burrowing owl (*Athene*	Same as Alternative 1C. Caltrans consulted informally with the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the Federal Endangered Species Act, who concurred that Alternative 2 would not likely adversely affect the California red-legged frog or Alameda whipsnake.	Same as Alternative 1C.	Alternative 5 would impact less suitable habitat for the bumble bees than Alternative 1C. Although there is also a low potential for northwestern pond turtle to be in the vicinity of Willow Pass Road to Monument Boulevard and Rudgear Road to Livorna Road, Alternative 5 would not widen the

Affected Resource	Potential Impact				
	No-Build Alternative	**Alternative 1C**	**Alternative 2 (Preferred Alternative)**	**Alternative 3**	**Alternative 5**
		cunicularia hypugaea). Alternative 1C would also result in temporary and permanent impacts on suitable habitat for the following candidate species for listing: Crotch's bumble bee (*Bombus crotchii*) and western bumble bee (*B. occidentalis*). There is also a low potential for northwestern pond turtle (*Actinemys marmorata*) to be in the vicinity of Willow Pass Road to Monument Boulevard and Rudgear Road to Livorna Road. General biological resources measures (**BIO-GEN-1** through **BIO-GEN-16**) and Measures **BIO-BEE-1**, **BIO-TURTLE-1**,			Rudgear Road Undercrossing Bridge.

Affected Resource	Potential Impact				
	No-Build Alternative	**Alternative 1C**	**Alternative 2 (Preferred Alternative)**	**Alternative 3**	**Alternative 5**
		BIO-OWL-1, **BIO-FWS-1** through **BIO-FWS-4** would be sufficient to minimize and avoid impacting threatened and endangered species.			
Invasive Species	None	Construction activities have the potential to inadvertently spread noxious weed species. General biological resources measures (**BIO-GEN-1** through **BIO-GEN-16**) would be sufficient to avoid the introduction of invasive species.	Same as Alternative 1C.	Same as Alternative 1C.	Same as Alternative 1C.
Wildfire		Alternative 1C would not impair implementation of an emergency response or emergency evacuation plan, exacerbate wildfire	Same as Alternative 1C.	Same as Alternative 1C.	Same as Alternative 1C.

Affected Resource	Potential Impact				
	No-Build Alternative	**Alternative 1C**	**Alternative 2 (Preferred Alternative)**	**Alternative 3**	**Alternative 5**
		risks or expose Project occupants to pollutants from a wildfire or the uncontrolled spread of a wildfire. Measure **US-3** includes measures to minimize the risk of fires during construction activities.			
Climate Change (CEQA-Only)		Overall, Alternative 1C would have lower operational greenhouse gas (GHG) emissions compared to baseline (2020) conditions and slightly higher GHG emissions than the No-Build Alternative in the Design Year (2047). Project construction would result in an increase in GHG emissions that would be offset by the long-	Same as Alternative 1C.	Same as Alternative 1C.	Similar to Alternative 1C. However, GHG emissions would be slightly less than the No-Build Alternative in the Design Year.

Affected Resource	Potential Impact				
	No-Build Alternative	Alternative 1C	Alternative 2 (Preferred Alternative)	Alternative 3	Alternative 5
		term improvement in operational GHG emissions compared to existing conditions. The Project is outside the coastal zone and not in an area subject to sea-level rise. Alternative 1C is not anticipated to exacerbate the effects of climate change in terms of precipitation or wildfire.			

Table S-2. Avoidance, Minimization, and/or Mitigation Measures

Affected Resource	Avoidance, Minimization, and/or Mitigation Measures
Existing and Future Land Use	None
Consistency with State, Regional, and	**CIA-1:** During the design phase, the Contra Costa Transportation Authority (CCTA) and California Department of Transportation (Caltrans) will continue to coordinate with the multiple regional and local government agencies

Affected Resource	Avoidance, Minimization, and/or Mitigation Measures
Local Plans and Programs	involved in the proposed Project to improve traffic conditions along Interstate 680 (I-680) within Contra Costa County.
Coastal Zone	None
Wild and Scenic Rivers	None
Parks and Recreational Facilities	**PR-1:** Temporary Detours for Recreation Trails. CCTA will require that recreation trails within the Study Area remain open to the public during construction. If a segment of a recreation trail must be closed, CCTA will work with the officials with jurisdiction and local agencies to identify detours and appropriate signage and flagging to minimize impacts to trail users. All temporary trails will have a minimum width in compliance with current Americans with Disability Act standards. **PR-2:** Temporary Construction Areas. All temporary construction areas within or adjacent to recreation areas, including parks, trails, pathways, and/or other recreational facilities, will be restored to a condition as good or better than that of the property prior to construction. CCTA, along with the construction contractor, will work with affected agencies and the officials with jurisdiction to identify the necessary rehabilitation activities. **PR-3:** Iron Horse Regional Trail Relocation. Caltrans and CCTA will work with the East Bay Regional Park District to identify a suitable location to shift the Iron Horse Regional Trail under the Rudgear Road Undercrossing Bridge. In addition, Caltrans will coordinate with the Contra Costa Flood and Water Conservation District, Contra Costa Water District, Contra Costa County Superintendent, and Kinder Morgan. CCTA will also assist the East Bay Regional Park District in acquiring any necessary ROW or easements for this segment of the trail.
Farmlands	None
Timberlands	None
Growth	None
Community Character and Cohesion	**CIA-2:** Caltrans will follow the process required for acquisition of ROW under the federal Uniform Relocation Assistance Program. **CIA-3:** During the design phase, CCTA and Caltrans will continue to coordinate with the City of Walnut Creek to avoid permanent and minimize temporary impacts on operations at Walnut Creek's Corporation Yard (511 Lawrence Way).

Affected Resource	Avoidance, Minimization, and/or Mitigation Measures
Relocations and Real Property Acquisitions	None
Utilities/ Emergency Services	**UES-1:** During construction, Resident Engineer or designated contractor will ensure that utility services for any underground or aboveground utilities that will be disturbed and/or removed during construction of the proposed Project will be maintained to avoid interruptions in service. If interruptions in service are unavoidable, notice will be given, and proper arrangements will be made with the affected residents and businesses. **UES-2:** Prior to grading activities, Underground Service Alert will be notified at least 2 days prior to excavation, by calling 811. **UES-3:** To minimize risk of fires during construction activities, Resident Engineer or designated contractor will ensure the implementation of the following minimization measures: a. Coordinate with CAL FIRE and local fire departments to identify and maintain defensible spaces around active construction areas. b. Coordinate with CAL FIRE and local fire departments to identify and maintain firefighting equipment (e.g., extinguishers, shovels, water tankers) in active construction areas. c. Post emergency services phone numbers (i.e., fire, emergency medical, police) in visible locations in all active construction areas.
Traffic and Transportation	**TRAN-1:** No two consecutive off-ramps or two consecutive on-ramps in the same direction will be closed concurrently during construction. **TRAN-MM-1:** ***I-680 Express Bus Service.*** CCTA will work with County Connection and Livermore Amador Valley Transit Authority to implement a new I-680 express bus service and provide funding to rebrand, refurbish, and upgrade six existing buses for interim service (before hydrogen fuel-cell buses are available) and acquire six hydrogen fuel-cell buses (and one spare) when they are available for purchase. **TRAN-MM-2:** ***Shared Mobility Hubs.*** CCTA will pursue funds and ensure the implementation of the following mobility hubs: Bollinger Canyon Road, Walnut Creek Bay Area Rapid Transit Station, and Martinez Amtrak Station. These hubs will be designed to support I-680 Express Bus Service as well as other fixed-route transit services. The hubs may include mobility hub improvements and Mobility-on-Demand/Mobility-as-a-Service application and could potentially include additional mobility services, such as microtransit and/or increased eBike/eScooter operations.

Affected Resource	Avoidance, Minimization, and/or Mitigation Measures
	TRAN-MM-3: *Transportation Demand Management (TDM) Program Augmentation*. CCTA will pursue funds and ensure the implementation of a countywide TDM Program for the I-680 Express Lane Completion Project. This program will consist of enhancing existing and creating new TDM incentives within Contra Costa County. The program will not supplant, supersede, or replace current CCTA TDM initiatives funded by the Transportation Fund for Clean Air or Measure J. CCTA will operate the program through the County's existing TDM program (511 Contra Costa).
Pedestrian and Bicycle Facilities	See *Parks and Recreational Facilities* for Measures **PR-1** through **PR-3**.
Visual/Aesthetics	**VIS-1: Vegetation Removal.** During construction, the construction contractor will minimize the removal of groundcover, shrubs, and mature trees to the maximum extent possible, and utilize unvegetated areas for contractor staging/storage areas, when feasible. The construction contract will protect vegetation outside the clearing and grubbing limits from the contractor's operations, equipment, and materials storage. High visibility temporary fencing will be placed around vegetation to be protected before roadway work begins. Regular watering of vegetation should be provided to vegetation when construction interrupts normal automated irrigation. All disturbed areas will receive hydroseeded treatment of erosion control grasses, and if appropriate, locally native grasses. Any roadside vegetation and irrigation systems that are damaged or removed during Project construction will be replaced according to Caltrans policy. When trenching for utilities, the construction contractor will avoid trenching within drip lines of trees and screening shrubs. Directional drilling that would avoid damaging root systems of established plant material will be used, when reasonable, as opposed to open trenching to install new conduit in places where work within the drip line would be required. Trees and screening shrubs will be protected from damage during construction. **VIS-2: Landscape Plan.** During the design phase, CCTA and Caltrans or designated contractors will prepare a highway landscape plan that will identify all opportunities to use areas within the state ROW for full landscaping consistent with the Caltrans Highway Design Manual. This will include planting for graded areas with plant species consistent with adjacent vegetation and enhancement of new Project structures such as ramps and tunnels to the extent feasible. This plan will incorporate all applicable procedures and requirement detailed in the Caltrans Highway Design Manual Chapter 900 – Landscape Architecture- Roadside (July 2020), consistent with the Classified Landscaped Freeway policies, and consistent with applicable city general plans or municipal codes, as applicable.

Affected Resource	Avoidance, Minimization, and/or Mitigation Measures
	During the design phase, the Caltrans District 4 Landscape Architect will verify that the design minimizes removal of existing mature trees. If removal of mature trees cannot be avoided, additional landscape improvements will be incorporated into the final design for these areas, where feasible. Highway planting within Caltrans right-of-way will be provided where feasible to screen residential views of proposed express lane signs and lights and other highway activity and infrastructure. Caltrans safety-setback requirements will apply for all plantings within State right-of-way. During the design phase, the Caltrans District 4 Landscape Architect will ensure that topography, visual screening, and adjacent development are considered in the placement of overhead signs, sign gantries, and sign lighting to minimize visual impacts on residents along the Project corridor. Locations of Project features may be adjusted where feasible given highway safety standards and other engineering and environmental considerations. **VIS-3: Construction Shields.** During construction, the construction contractor will place unsightly materials, equipment storage, and staging so that they are not visible within the foreground of the highway corridor to the maximum extent feasible. Where such siting is unavoidable, material and equipment will be stored and visually screened to minimize visibility from the roadway and nearby sensitive off-road receptors. **VIS-4: Lighting Plan.** During the design phase, CCTA and Caltrans will prepare a Lighting Plan and ensure that lighting fixtures be selected to minimize glare on adjacent properties and into the night sky. Lighting will be shielded with non-glare hoods and focused within the Project ROW. The Lighting Plan will be reviewed and approved by Caltrans District 4 Landscape Architect prior to construction to ensure compliance with these criteria. Construction lighting will be limited to within the area of work and light trespass will be avoided through the use of directional lighting and shielding as needed. **VIS-5: Aesthetic Treatments.** During the design phase, CCTA or designated contractors will work with Caltrans District 4 staff in order to verify that design elements are consistent with the vision for the Contra Costa County regarding aesthetic enhancements, scenic corridors, landscaping, and tree removal and plantings policies. During the design phase, the Project Development Team will evaluate the aesthetic enhancements to be incorporated into the constructed elements to the extent feasible, such as design and color treatment for the new overhead sign structures, gantries, VTMSs and light standards shall be similar to the existing adjacent structures and poles, so to be visually compatible and consistent with the existing installations along the corridor. Additionally, where feasible, new concrete safety barriers and retaining walls should match the aesthetics (color, pattern and/or texture) of the existing barriers/walls along corridor for visual consistency. Treatments of color, pattern and/or texture are required in order to reduce visual impacts, glare, and the possible incidence of graffiti. If needed, maintenance agreements will be established during the design phase. Where feasible, vines could be planted along soundwalls to reduce visual impacts, potential for glare, and reduce the incidence of graffiti. Reference *Contra Costa I-680 Comprehensive Multimodal Corridor Plan* for aesthetic and landscape guidelines.

Affected Resource	Avoidance, Minimization, and/or Mitigation Measures
	See *Natural Communities* for Measure **BIO-GEN-10** and Mitigation Measure **BIO-MM-1**.
Cultural Resources	**CUL-1: Unanticipated Discovery of Cultural Resources.** 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. **CUL-2: Unanticipated Discovery of Human Remains.** If human remains are discovered, California Health and Safety Code (H&SC) Section 7050.5 states that further disturbances and activities shall stop in any area or nearby area suspected to overlie remains, and the County Coroner contacted. If the remains are thought by the coroner to be Native American, the coroner will notify the Native American Heritage Commission, who, pursuant to Public Resources Code (PRC) Section 5097.98, will then notify the Most Likely Descendent (MLD). At this time, the person who discovered the remains will contact District Environmental Branch 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.
Hydrology and Floodplain	**HYD-1:** During final design, the Resident Engineer or designated contractor will ensure that treatment Best Management Practices (BMP) in close proximity to the floodway along San Ramon Creek at Livorna Road (PM R11.33) will be analyzed to confirm the BMPs will have no impact on the base flood elevation or floodplain. The analysis will be coordinated with floodplain management agencies, including Contra Costa County Flood Control and Water Conservation District during the design phase. See *Natural Communities* for Measure **BIO-GEN-1** through **BIO-GEN-16**. See *Plant Species* for **BIO-PLANTS-1**. See *Threatened and Endangered Species* for **BIO-TURTLE-1** and **BIO-FWS-1** and **BIO-FWS-2**.
Water Quality and Storm Water Runoff	**WQ-1:** During construction, the Resident Engineer or designated contractor will ensure the Project complies with the provisions of the Caltrans National Pollutant Discharge Elimination System (NPDES) Statewide Storm Water Permit and the NPDES General Permit for Storm Water Discharges of Stormwater Runoff Associated with Construction Activities in effect at the time of construction. **WQ-2:** Prior to construction, a stormwater pollution prevention plan (SWPPP) will be prepared and implemented to address all construction-related activities, equipment, and materials that have the potential to impact water quality. The SWPPP will identify the sources of pollutants that may affect the quality of stormwater and include the construction site BMPs to control pollutants such as sediment control, drainage inlet protection, construction materials management, and non-stormwater BMPs. Additional BMP reference material is contained within the Project Planning and Design Guide (Caltrans, 2019) and Construction Manual (Caltrans, 2022). These include, but are not limited to, temporary sediment control, temporary soil stabilization, scheduling, waste management, materials handling, and other non-stormwater BMPs.

Affected Resource	Avoidance, Minimization, and/or Mitigation Measures
	WQ-3: During the design phase, the Design Engineer will ensure Caltrans-approved design pollution prevention BMPs for the Project will be further investigated. Design pollution prevention BMPs may include preservation of existing vegetation, slope/surface protection systems, and permanent erosion control measures (e.g., hydroseeding, hydromulch, fiber rolls, and netting). **WQ-4:** Potential post-construction treatment BMPs have been identified. During the design phase, the Design Engineer will ensure Caltrans-approved treatment BMPs will be further investigated and be consistent with the requirements of the NPDES Permit and Waste Discharge Requirements for the State of California, Department of Transportation, in effect at the time of design. Treatment BMPs may include infiltration devices, biofiltration devices, detention devices, media filters, and gross solids removal devices (e.g., trash capture devices).
Geology/ Soils/ Seismic/ Topography	**GEO-1:** Prior to completion of final design, the Design Engineer will ensure that a professional geologist or professional engineer prepare a design-level geotechnical report. Recommendations from the final design-level geotechnical report will be incorporated into the final Project plans and specifications during the final design phase to ensure the geotechnical stability of the Project. This report will document soil-related constraints and hazards, such as slope instability, settlement liquefaction, or related secondary seismic impacts, which may be present. The report will also include: • Evaluation of expansive and potentially corrosive soils and recommendations regarding construction procedures and/or design criteria to reduce the effect of these soils on Project development, • Identification of potential liquefiable areas within the Project Study Limits and recommendations for mitigation measures, • Demonstration that the design of all proposed retaining walls is geotechnically suitable for soils within the Project Study Limits, and • Geotechnical recommendations for the specific foundation design and earthwork construction considered for this Project. See *Hazardous Waste/Materials* for Measure **HAZ-6**.
Paleontology	**PAL-1: Paleontological Mitigation Plan.** Prepare a Paleontological Mitigation Plan once Project design is nearly complete. The final plan will be implemented during construction. Include a specification in the construction contract stating that paleontological monitoring will occur in accordance with the Paleontological Mitigation Plan. Prepare a final report documenting the implementation of the approved Paleontological Mitigation Plan (i.e., Paleontological Mitigation Report). It is anticipated that the Paleontological Mitigation Plan would include the following measures:

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	• A Project-specific Paleontological Mitigation Plan will be prepared by a qualified principal paleontologist (MS or PhD in paleontology) once adequate Project design information regarding subsurface disturbance location, depth, and lateral extent is available. • The qualified principal paleontologist will be present at preconstruction meetings to confer with contractors who will be performing ground-disturbing activities. • Paleontological monitors, under the direction of the qualified principal paleontologist, will be on site to inspect cuts for fossils at all times during original ground disturbance involving sensitive geologic formations. • When fossils are discovered, the paleontologist (or paleontological monitor) will recover them. Construction work in these areas may be halted or diverted by the Resident Engineer to allow the prompt recovery of fossils. • Fossils collected during the monitoring and salvage portion of the mitigation program will be prepared to the point of identification, sorted, and cataloged. • Prepared fossils, along with copies of all pertinent field notes, photos, and maps, will be deposited in a scientific institution with paleontological collections. • A Paleontological Mitigation Report will be completed that outlines the results of the mitigation program. • Where feasible, selected road cuts or large finished slopes in areas with critically interesting paleontological features may be left exposed to serve as important educational and scientific features. This may be possible if no substantial adverse visual or safety impacts result.
Hazardous Waste/ Materials	**HAZ-1: Preliminary Site Investigation**. During the design phase, Caltrans Office of Environmental Engineering will ensure that a Preliminary Site Investigation (PSI) is conducted at City of Walnut Creek Corporation Yard, 511 Lawrence Way, Walnut Creek, CA (Assessor Parcel Number 173-014-005) in the area that would be disturbed by the Project. The PSI would assess for the presence of site contamination, including hydrocarbons and volatile organic compounds in soil and groundwater. **HAZ-2: Aerially Deposited Lead**. Soils located within Caltrans ROW have the potential to contain aerially deposited lead (ADL). During the design phase, Caltrans Office of Environmental Engineering will ensure that soil sampling and analysis for ADL be conducted on Caltrans ROW (within the Project disturbance limits) that have not been previously characterized, to determine the proper handling and disposal requirements. Soil determined to contain lead concentrations exceeding stipulated thresholds must be managed in accordance with Caltrans Standard Specifications, Section 14-11.08 Regulated Material Containing Aerially Deposited Lead (2022) and under the July 1, 2016, ADL Agreement between Caltrans and the Department of Toxic Substances

Affected Resource	Avoidance, Minimization, and/or Mitigation Measures
	Control. This ADL Agreement allows such soils to be safely reused within the Project Study Limits, as long as all requirements of the ADL Agreement are met. **HAZ-3: Asbestos-Containing Material and Lead-Based Paint.** Structures, including buildings and bridges, may contain asbestos-containing materials (ACM) and lead-based paint (LBP). During the design phase, Caltrans Office of Environmental Engineering will ensure that structures are sampled for ACM and LBP prior to any demolition or disturbance activities. Soils surrounding the structures that will be disturbed should also be sampled for ACM and LBP. In addition, the Caltrans Office of Environmental Engineering will ensure that the survey is conducted in conformance with the United States Environmental Protection Agency National Emission Standards for Hazardous Air Pollutants 40 Code of Federal Regulations (CFR), South Coast Air Quality Management District Rule 1403, and in accordance with Caltrans Standard Specifications, Section 14-11.13, Disturbance of Existing Paint Systems on Bridges, and Section 14-11.16, Asbestos-Containing Construction Materials in Bridges (2022). **HAZ-4: Agricultural Land Uses**. Soils within the Project Study Limits that have not been previously disturbed may contain residual pesticides, herbicides, and petroleum from historical agricultural uses. During the design phase, the Caltrans Office of Environmental Engineering will ensure that undisturbed soil on historic agricultural land that may be disturbed by the proposed Project are sampled for pesticides, herbicides, and petroleum. **HAZ-5: Railroad Land Uses**. Soil and groundwater within the Project Study Limits may be contaminated with common railroad-related contaminates, including polynuclear aromatic hydrocarbons, asbestos, heavy metals, herbicides, and pesticides, from existing and historical railroad uses. During the design phase, Caltrans Office of Environmental Engineering will ensure that soil and groundwater on historical and existing railroad land that may be disturbed by the proposed Project are sampled for common railroad-related contaminants. **HAZ-6: Construction Health and Safety Plan.** Prior to construction, Caltrans Office of Environmental Engineering will ensure that a Health and Safety Plan is developed to guide all construction activities. A Certified Industrial Hygienist will review this plan, based on evaluations of proposed construction activities, the potential hazards identified in Project's Phase I Initial Site Assessment (Parikh Consultants, Inc. 2022), and any future assessment prepared for the Project. This plan will contain specific procedures for encountering expected and unexpected contaminants. It will prescribe safe work practices, contaminant monitoring, personal protective equipment, emergency response procedures, and safety training requirements to protect construction workers and third parties. The plan will meet the requirements of 29 CFR 1910 and 1926, and all other applicable federal, State, and local regulations and requirements. The designated contractor will be responsible for preparing the Health and Safety Plan before the start of construction.

Affected Resource	Avoidance, Minimization, and/or Mitigation Measures
Air Quality	**AQ-1: Equipment Maintenance.** During construction, the Project's Resident Engineer or designated contractor will ensure compliance with Caltrans' Standard Specifications Section 7-1.02C, which requires that the construction contractor keep engines properly tuned and limit idling. **AQ-2: Stormwater Best Management Practices.** During construction, the Project's Resident Engineer or designated contractor will ensure compliance with Caltrans' Standard Specifications Section 13 – Water Pollution Control, which requires a SWPPP and use of BMPs that manage fugitive dust and material track-out from construction sites. Many of the SWPPP requirements and BMPs are the same as Bay Area Air Quality Management District's (BAAQMD) basic controls for construction sites (see AQ-5 and AQ-6). **AQ-3: Compliance with Air Quality Regulations and Ordinances.** During construction, the Project's Resident Engineer or designated contractor will ensure compliance with Caltrans' Standard Specifications Section 14-9 – Air Quality, which specifically requires compliance by the construction contractor with all applicable laws and regulations related to air quality, including air pollution control district and air quality management district regulations and local ordinances. **AQ-4: Dust Control.** During construction, the Project's Resident Engineer or designated contractor will ensure compliance with Caltrans' Standard Specifications Section 18 – Dust Palliatives, which includes requirements for the use of dust suppressants or controls that the construction contractor must follow. **AQ-5: Construction Best Practices for Exhaust.** During construction, the Project's Resident Engineer or designated contractor will ensure that exhaust control BMPs for construction related emissions are implemented as specified in the most recent Regional Transportation Plan, in which the Project is considered, where feasible and necessary. The following are construction BMPs from Mitigation Measure AQ-2 in the *Final Environmental Impact Report Plan Bay Area 2050* (Metropolitan Transportation Commission 2021): • Equipment shall be zero emissions or have engines that meet or exceed either U.S. Environmental Protection Agency (EPA) or California Air Resources Board (CARB) Tier 4 off-road emission standards, and it shall have engines that are retrofitted with a CARB Level 3 Verified Diesel Emissions Control Strategy (VDECS), if one is available for the equipment being used. Equipment with engines that meet Tier 4 Interim or Tier 4 Final emission standards automatically meet this requirement; therefore, a VDECS would not be required. • Idling time of diesel-powered construction equipment and trucks shall be limited to no more than two minutes. Clear signage of this idling restriction shall be provided for construction workers at all access points. • All construction equipment shall be maintained and properly tuned in accordance with the manufacturers' specifications. • Portable diesel generators shall be prohibited. Grid power electricity should be used to provide power at construction sites; or propane and natural gas generators may be used when grid power electricity is not feasible.

Affected Resource	Avoidance, Minimization, and/or Mitigation Measures
	AQ-6: Construction Best Management Practices for Dust. During construction, the Project's Resident Engineer or designated contractor will ensure that dust control BMPs for construction related emissions during ground disturbance are implemented as specified in the most recent Regional Transportation Plan, in which the Project is considered, where feasible and necessary. The following are construction BMPs from Mitigation Measure AQ-2 in the *Final Environmental Impact Report Plan Bay Area 2050* (Metropolitan Transportation Commission 2021): • All haul trucks transporting soil, sand, or other loose material off-site shall be covered. • On-site dirt piles or other stockpiled particulate matter shall be covered, wind breaks installed, and water and/or soil stabilizers employed to reduce wind-blown dust emissions. The use of approved nontoxic soil stabilizers shall be incorporated according to manufacturers' specifications to all inactive construction areas. • All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. Dry power sweeping should only be performed in conjunction with thorough watering of the subject roads. • All vehicle speeds on unpaved roads and surfaces shall be limited to 15 mph. • All roadway, driveway, and sidewalk paving shall be completed as soon as possible. Building pads shall be paved as soon as possible after grading. • All construction sites shall provide a posted sign visible to the public with the telephone number and person to contact at the lead agency regarding dust complaints. The recommended response time for corrective action shall be within 48 hours. BAAQMD's Complaint Line (1-800-334-6367) shall also be included on posted signs to ensure compliance with applicable regulations. • All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph. • Wind breaks (e.g., trees, fences) shall be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50 percent air porosity. • Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established. • The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time. • All trucks and equipment, including their tires, shall be washed off before leaving the site.

Affected Resource	Avoidance, Minimization, and/or Mitigation Measures
	• Site accesses to a distance of 100 feet from the paved road shall be treated with a 6- to 12-inch compacted layer of wood chips, mulch, or gravel. **AQ-7:** Prior to demolition activities, the presence or absence of asbestos in the structures would be confirmed. If asbestos-containing materials are identified, the Project must also comply with BAAQMD Regulation 11, Rule 2 (Asbestos Demolition, Renovation, and Manufacturing), which requires all asbestos-containing material found in the Project footprint be removed prior to demolition or renovation activity. There are specific requirements for surveying, notification, removal, and disposal of asbestos containing materials required by BAAQMD Regulation 11, Rule 2 (Asbestos Demolition, Renovation, and Manufacturing). BAAQMD Regulation should be consulted for specific requirements that pertain to the materials encountered. See *Hazardous Waste/Materials* for Measures **HAZ-2** and **HAZ-3**.
Noise and Vibration	**NOI-1:** During construction, the Project's Resident Engineer or their designated contractor will ensure the following measures be implemented during Project construction to reduce the potential for temporary noise impacts. • All construction equipment shall conform to Standard Special Provision Section 14-8.02, *Noise Control*, which requires noise not to exceed 52 dBA, preparation of a Noise Control Plan, and noise monitoring. • When feasible, noise-generating construction activities shall be restricted to between 7:00 a.m. and 7:00 p.m. on weekdays, with no construction occurring on weekends or holidays. If work is necessary outside of these hours, Caltrans shall require the contractor to implement a construction noise monitoring program and provide additional noise controls where practical and feasible. • Pile driving activities shall be limited to daytime hours only. • All internal combustion engine driven equipment shall be equipped with manufacturer recommended intake and exhaust mufflers that are in good condition and appropriate for the equipment. • Unnecessary idling of internal combustion engines shall be strictly prohibited. • Noise-generating equipment shall be located as far as practical from sensitive receptors when sensitive receptors adjoin or are near the construction Project area. • "Quiet" air compressors and other "quiet" equipment shall be utilized where such technology exists.
Vibration	**VIB-1:** During construction, the Project's Resident Engineer or their designated contractor will ensure that the following measures be implemented during Project construction to reduce the potential for temporary vibration impacts.

Affected Resource	Avoidance, Minimization, and/or Mitigation Measures
	• Prohibit impact or vibratory pile driving methods when within the exceedance distances from vibration-sensitive structures as listed in Table 2.2.7-4. Cast-in-Drilled Hole (CIDH) Piles is an alternative method that causes lower vibration levels. CIDH Piles should be used where geological conditions permit their use. ○ CIDH piles would exceed the 0.25-inches per second peak particle velocity (PPV) threshold for historic structures at 10 feet, the 0.3-inches per second PPV threshold for older structures at 9 feet, and the 0.5-inches per second PPV threshold for newer construction structures at 6 feet. • Avoid the use of vibratory rollers within 25 feet of sensitive structures. Static mode compaction shall be used when construction activities are less than 25 feet from sensitive structures. • Avoid dropping heavy objects or equipment within 25 feet of sensitive structures. • Place operating equipment on the construction site as far as possible from vibration-sensitive receptors. • Designate a person responsible for registering and investigating claims of excessive vibration. The contact information of such person shall be clearly posted on the construction site.
Energy	**E-1: Greenhouse Gas Reduction Efforts.** During construction, the Project's Resident Engineer will ensure that the following site-specific measure will be implemented where necessary and feasible to avoid or minimize impacts related to construction greenhouse gas emissions: • A program that incentivizes construction workers to carpool and/or use public transit or electric vehicles to commute to and from the Project site will be implemented. **E-2: Construction Equipment Operation.** Prior to construction, the Project's Resident Engineer will ensure that a list of all off-road equipment greater than 25 horsepower (hp) that would be operated for more than 20 hours over the entire duration of Project construction, including equipment from subcontractors, be submitted to the relevant air district (e.g., BAAQMD) for review and certification. The list shall include all information necessary to ensure the equipment meets the following requirement: • Construction equipment shall be zero emissions or have engines that meet or exceed either U.S. EPA or CARB Tier 4 off-road emission standards and shall have engines that are retrofitted with a CARB Level 3 Verified Diesel Emissions Control Strategy (VDECS), if one is available for the equipment being used. Equipment with engines that meet Tier 4 Interim or Tier 4 Final emission standards automatically meet this requirement; therefore, a VDECS would not be required. • Idling time of diesel-powered construction equipment and trucks shall be limited to no more than two minutes. Clear signage of this idling restriction shall be provided for construction workers at all access points.

Affected Resource	Avoidance, Minimization, and/or Mitigation Measures
	• All construction equipment shall be maintained and properly tuned in accordance with the manufacturers' specifications. • Portable diesel generators shall be prohibited. Grid power electricity should be used to provide power at construction sites. Propane and natural gas generators may be used when grid power electricity is not feasible. **E-3: Emergency Services Management.** Prior to and during construction, the Project's Resident Engineer and CCTA will ensure that the designated contractor will communicate with emergency service providers through the public information program to avoid emergency service delays, by ensuring all providers are aware of lane closures well in advance of implementation. Proactive public information systems, such as changeable message signs, will notify travelers of pending construction activities and new operational activities.
Natural Communities	**BIO-GEN-1:** *U.S. Fish and Wildlife Service (USFWS)-Approved Biologist.* A USFWS-approved biologist would be present during all vegetation removal, initial ground-disturbing activities, and culvert activities in or adjacent to California red-legged frog (*Rana draytonii*), Alameda whipsnake (*Masticophis lateralis euryxanthus*), and northwestern pond turtle (*Actinemys marmorata*) habitat. Caltrans will submit the names and qualifications of the proposed biological monitor(s) for USFWS approval prior to initiating construction activities. The biologist will be present during work at the following locations: • Post Mile (PM) 22.5 – PM 21.8: Pacheco Boulevard area – between the work limits on the northbound side of I-680 and the habitat associated with Pacheco Creek to the north and east, as well as between the work limits on the southbound side of I-680 and its on-ramp from Pacheco Boulevard and the habitat associated with the unlined channel tributary to Pacheco Creek. • PM 21.0 – PM 20.9: I-680/SR-4 interchange area – between the work limits on the southbound side of I-680 and its on-ramp from SR-4 and the habitat associated with Grayson Creek to the south. • PM R19.2 – PM R18.2: Willow Pass Road to Monument Boulevard area – between the work limits on the northbound side of I-680 and the habitat associated with Walnut Creek to the east. • PM R12.7 – PM R11.3: Rudgear Road to Livorna Road – between the work limits on the southbound side of I-680 and the habitat associated with San Ramon Creek to the west and at the Rudgear Road Undercrossing Bridge. **BIO-GEN-2:** *Worker Environmental Training.* All construction personnel will attend a mandatory environmental education program delivered by a USFWS-approved biologist. New personnel will attend a training session before they are allowed to enter the Project site. All personnel will sign a form stating that they completed training and understand all applicable agency regulations and consequences of noncompliance. The contractor will provide translated training material, as needed. Caltrans will keep the forms on file and provide them in the post-construction compliance report. At a minimum, the training will include:

Affected Resource	Avoidance, Minimization, and/or Mitigation Measures
	• A description of special-status species that could occur onsite and their habitats, and other sensitive resources. • A review of applicable conservation measures and how to avoid impacts by implementing them. • A discussion of applicable agency regulations and consequences of noncompliance. **BIO-GEN-3:** *Stop Work Authority*. Through the Project's Resident Engineer, the USFWS-approved biologist will have the authority to stop work to avoid take of listed species, if they determine any permit and authorization requirements are not fully implemented, or unpermitted impacts on sensitive natural resources may occur. If the USFWS-approved biologist(s) exercises this authority, USFWS will be notified by telephone and email within 24 hours. Work will not be allowed to resume without authorization from the USFWS-approved biologist. **BIO-GEN-4:** *Preconstruction Surveys for Nesting Birds*. To avoid take of migratory birds during the nesting season (February 1 to September 30), to the extent feasible, vegetation and tree removal will only occur between October 1 and January 31. The qualified biologist will conduct preconstruction nesting bird surveys no more than 72 hours prior to the start of construction. If an active nest is discovered, the biologist will establish an appropriate exclusion buffer around the nest. The buffer will depend on species, an individual's response to disturbance, or the line-of-sight from the construction area to the nest. Equipment and personnel will not enter the buffer until the nest is inactive or juvenile birds are no longer dependent on adults. If a nesting special-status bird species is discovered, Caltrans will coordinate with regulatory agencies for assistance. **BIO-GEN-5:** *Caltrans Best Management Practices (Water Pollution Control).* Standard Caltrans BMPs, such as dust control, spill prevention and control, stockpile management, and other waste management practices as outlined in Section 13-1.01 of the Caltrans Standard Specifications shall be implemented. The Project will comply with the Construction General Permit issued by the State Water Resources Control Board and with Provisions of the Caltrans Statewide NPDES permit. The contractor will prepare and submit a SWPPP and Spill Prevention Plan for approval prior to the start of construction. Personnel will adhere to the instructions, protocols, and specifications, outlined in the most current Caltrans *Construction Site BMP Manual* and Caltrans Standard Specifications. At a minimum, protective measures will include: • Preventing pollutants generated by vehicle and equipment maintenance or cleaning from entering storm drains or aquatic resources. • Servicing or storing vehicles and equipment no less than 50 feet from storm drains or aquatic resources unless the features are protected by impermeable barriers. • Maintaining vehicles and equipment to prevent fluid leaks. • Storing hazardous materials such as fuels, oils, solvents, etc., in sealed containers at a designated location no less than 50 feet from storm drains or aquatic resources.

Affected Resource	Avoidance, Minimization, and/or Mitigation Measures
	• Collecting and disposing of concrete waste and contaminated water from curing in appropriate washouts located no less than 50 feet from storm drains and aquatic resources. • Capturing or controlling sediment with erosion control devices such as silt fence, fiber rolls, and appropriate erosion control netting, and covering temporary stockpiles. See also Measures **WQ-1** and **WQ-2**, discussed in Section 2.2.2, *Water Quality and Stormwater Runoff*. **BIO-GEN-6:** *Delineation of Environmentally Sensitive Areas (ESA).* ESA will be delineated using high-visibility fencing or alternative delineators. The fencing or delineators will be installed prior to the start of construction and regularly maintained and remain in place until construction is completed. Construction personnel or equipment will not access ESAs unless authorized by the biologist. **BIO-GEN-7:** *Prohibition of Monofilament Netting.* To prevent animals from being entangled, trapped or injured, monofilament fiber will not be used in erosion control devices or animal exclusion devices. **BIO-GEN-8:** *Prevention of Wildlife Entrapment*. To prevent inadvertent entrapment of wildlife during construction excavated holes or trenches more than 1-foot-deep with walls steeper than 30 degrees would be covered by plywood or similar materials at the close of each working day. Alternatively, one or more escape ramps constructed of earth fill or wooden planks would be installed. Before such holes or trenches are filled, they would be thoroughly inspected for trapped animals. **BIO-GEN-9:** *Tree and Shrub Avoidance.* Tree and shrub removal will be avoided unless necessary to complete construction. Construction activities would avoid tree driplines. The following conservation measures will be implemented: • ESA fencing will be installed at least 1 foot out from the edge of the dripline and completely enclosed buffer. • The amount of water provided to the tree(s) should not differ from that which was supplied prior to the beginning of construction activities. • Signs, ropes, cables, or other items will not be attached to unremoved trees. • The following measures will be implemented if any disturbance is necessary within a tree's dripline: ○ If grades must be altered more than plus or minus six inches, an appropriate aeration will be installed, and positive drainage will be maintained. ○ If trenching is unavoidable, the number of trenches will be minimized to the greatest extent practicable. Trees will be trimmed to remove branches proportional to the number of roots lost.

Affected Resource	Avoidance, Minimization, and/or Mitigation Measures
	• Limit the amount of excavation and compaction within the root protection zone (equals the dripline radius) to the greatest extent possible. • No materials should be placed or stored within the root protection zone at any time through the duration of the Project. Spoils shall not be placed within the tree protection zone either temporarily or permanently. If trees must be removed: ○ A certified arborist will mark trees necessary for removal before removal begins. ○ Tree pruning or removal would be performed by a certified arborist according to ANSI A300 pruning standards. Trees that need to be removed or pruned should be identified in the preconstruction walk through. **BIO-GEN-10:** *Invasive Species Control.* After construction is complete, the contractor will restore disturbed topographical contours to preconstruction conditions. The contractor would contain and remove noxious weeds and associated plant material, and obtain all permits, licenses, and certifications for proper disposal. The contractor would replant disturbed areas with fast-growing native grasses or a native erosion control seed mixture. Where seeding is not practical, the contractor would cover temporarily disturbed areas with black plastic solarization material. The contractor would maintain the material throughout the duration of construction and remove the material at the end of construction. **BIO-GEN-11:** *Revegetation Following Construction.* All areas that are temporarily affected during construction shall be revegetated with an assemblage of native grass, shrub, and trees as appropriate. Invasive, exotic plants would be controlled within the Project area to the maximum extent practicable, pursuant to Executive Order 13112. **BIO-GEN-12:** *Dust Control.* Dust control measures would consist of regular truck watering of construction access areas and disturbed soil areas with the use of organic soil stabilizers to minimize airborne dust and soil particles generated from graded areas. Regular truck watering would be a requirement of the construction contract. In addition, for disturbed soil areas, an organic tackifier to control dust emissions blowing off of the ROW or out of the construction area during construction would be included in the contract special provisions. Watering guidelines would be established to avoid any excessive run-off that may flow into contiguous areas. Any material stockpiles would be watered, sprayed with tackifier, or covered, to minimize dust production and wind erosion. **BIO-GEN-13:** *Minimization of Lighting Impacts.* To the extent practicable, nighttime construction shall be minimized. Approximately 63 days of nightwork are anticipated. Artificial lighting of the Action Area during nighttime hours would be minimized to the maximum extent practicable and would be directed away from sensitive resources. Artificial lighting would be directed away from vegetated areas and only directed at areas where active construction is occurring. If lighting cannot be directed away from vegetated areas, shielding will be implemented to avoid spillover. Permanent light fixtures would have shielding, light-emitting diodes configured at the minimum necessary number of bulbs, as well as optimal mounting height, mast-arm length, and angle to restrict light to the roadways.

Affected Resource	Avoidance, Minimization, and/or Mitigation Measures
	BIO-GEN-14: *Noise Control.* Construction-generated noise associated with the proposed Project will comply with Caltrans Standard Specification 14-8.02 Noise Control. **BIO-GEN-15:** *Trash Removal.* All food-related trash items such as wrappers, cans, bottles, and food scraps would be disposed of in closed containers and removed at a minimum weekly from the work area. **BIO-GEN-16:** *Vehicle Use Compliance.* All personnel working on the proposed Project would be required to comply with guidance governing vehicle use, speed limits on unpaved roads, fire prevention, and other hazards. **BIO-MM-1:** *Oak Woodlands.* In accordance with Senate Concurrent Resolution No. 17: Oak Woodlands, native oak woodlands will be avoided to the maximum extent feasible. Any oak trees that are impacted would be mitigated through replacement or compensatory mitigation at a ratio to be determined in consultation with the California Department of Fish and Wildlife (CDFW) and based on the size of the tree removed, with large-diameter trees requiring greater replacement numbers than small trees. A Tree Protection Plan will be prepared and implemented to minimize damage to native trees during construction. Precise tree planting locations will be determined during the final design phase and will occur within the Caltrans ROW. Replanted areas will be monitored for success for up to 3 to 10 years and subject to success criteria. The performance criterion for replacement tree plantings is 70 percent survival of all plantings at the end of the monitoring period.
Wetlands and Other Waters	**BIO-MM-2:** *Jurisdictional Waters.* Where impact areas overlap or would be adjacent to potential wetlands/waters, these wetlands/waters would be avoided to the greatest extent practicable. The location of permanent BMPs will be refined during final design and wetlands and other waters would be avoided where feasible. Mitigation for any permanent impacts on aquatic resources shall be provided at a minimum of 1:1 ratio, which would be determined in consultation with the permitting agencies during final design. Mitigation can be achieved through onsite restoration, in-lieu fee payment, or purchase of mitigation credits at a mitigation bank approved by U.S. Army Corps of Engineers (USACE) or Regional Water Quality Control Board (RWQCB). Mitigation as required in regulatory permits issued through USACE and/or the RWQCB may be applied. See *Natural Communities* for Measures **BIO-GEN-1** through **BIO-GEN-16**.
Plant Species	**BIO-PLANTS-1:** *Protocol-Level Botanical Surveys*. Protocol-level botanical surveys will be conducted by a qualified biologist in appropriate habitat for Congdon's tarplant (brome grassland) during the appropriate blooming period for the species (May through October). Surveys will be conducted during the two seasons prior to initial ground disturbance. If Congdon's tarplant, or any other rare plants are detected during these surveys, they will be mapped and flagged or fenced off for avoidance. Caltrans will contact CDFW for assistance if necessary. See *Natural Communities* for Measures **BIO-GEN-1** through **BIO-GEN-16**.

Affected Resource	Avoidance, Minimization, and/or Mitigation Measures
Animal Species	**BIO-BADGER-1:** *American Badger Preconstruction Burrow Mapping and Avoidance*. While carrying out protocol burrowing owl surveys (BIO-OWL-1), mapping of all mammal burrows will be conducted within suitable habitat up to 500 meters of proposed Project impact areas (if accessible). During these surveys, any American badger burrows in the survey area will be mapped. Any American badger burrows identified during these surveys will be avoided by a minimum of 200 feet (occupied by adult badgers), and 500 feet if it is found to be a natal burrow (badger young present). Caltrans will contact CDFW for assistance if American badger dens are discovered. **BIO-BAT-1:** *Bats Preconstruction Surveys*. A Caltrans-approved bat biologist will conduct preconstruction bat surveys no more than 3 days prior to the start of construction. If an active maternity roost is discovered, the biologist will establish an appropriate buffer around the roosts. Caltrans will contact CDFW for assistance if roosting bats or evidence of roosting are observed. **BIO-BAT-2:** *Bat Roost Avoidance*. If bats are detected roosting within a bridge structure within 250 feet of disturbance, lighting will be directed away from the roosts, and combustion equipment and vehicles will not be parked or operated under the bridge or structure. If a roost is discovered in a structure or tree that is to be removed, then an appropriate exclusion method will be implemented in coordination with a qualified bat biologist. **BIO-BEE-1:** *Bumble Bee Preconstruction Nest Survey*. A biologist will conduct a preconstruction bumble bee nest survey prior to any ground disturbance associated with the proposed Project in brome grassland, semi-natural ornamental, or non-native woodland habitat. If a bumble bee nest is discovered in or within 50 feet of any disturbance area during the preconstruction survey, then the nest will be mapped, flagged, and avoided. **BIO-FALCON-1:** *Peregrine Falcon Preconstruction Survey*. If an active peregrine falcon nest is discovered, a qualified biologist will establish an appropriately sized buffer (no less than 500 feet) around it. The buffer will remain in place until the qualified biologist determines that the nest is no longer active, or the young have left the area or are no longer dependent on adults. Caltrans will contact CDFW for assistance if necessary. **BIO-KITE-1:** *White-tailed Kite Preconstruction Surveys*. If an active white-tailed kite nest is discovered, a qualified biologist will establish an appropriately sized buffer (no less than 300 feet) around it. The buffer will remain in place until the qualified biologist determines that the nest is no longer active, or the young have left the area or are no longer dependent on adults. Caltrans will contact CDFW for assistance if necessary. **BIO-HAWK-1:** *Cooper's Hawk Nest Buffer*. If an active Cooper's hawk nest is discovered, a qualified biologist will establish an appropriately sized buffer (no less than 300 feet) around it. The buffer will remain in place until the qualified biologist determines that the nest is no longer active, or the young have left the area or are no longer dependent on adults. If necessary, Caltrans will contact CDFW for assistance if a Cooper's hawk nest is discovered. **BIO-LIZARD-1:** *Coast Horned Lizard Preconstruction Surveys*. A biologist will conduct a preconstruction survey prior to any ground disturbance to ensure coast horned lizards are absent in proposed Project impact areas between Livorna Road and Rudgear Road (PM R11.3 and PM R12.6).

Affected Resource	Avoidance, Minimization, and/or Mitigation Measures
	BIO-SNAIL-1: *Bridges' Coast Range Shoulderband Preconstruction Surveys.* A biologist will conduct a preconstruction survey for shoulderband snails prior to any ground disturbance in brome grassland, coast live oak woodland, mixed invasive field, non-native woodland, or semi-natural ornamental habitats. If a shoulderband snail colony is discovered in any disturbance area during the preconstruction survey during the preconstruction survey, then it will be mapped, flagged, and avoided. **BIO-WOODRAT-1:** *San Francisco Dusky-Footed Woodrat Preconstruction Survey*. Prior to clearing of any vegetation in the proposed Project impact areas or within 50 feet of ground disturbing activities, a qualified biologist shall conduct a survey for San Francisco dusky-footed woodrat nests. If San Francisco dusky-footed woodrat nests are located, an exclusion buffer of at least 50 feet from these nests will be established to avoid disturbing the nests. **BIO-WOODRAT-2:** *San Francisco Dusky-Footed Woodrat Nest Translocation*. Nest relocation will only occur if necessary and performed by a permitted biologist. Caltrans will contact CDFW if it is necessary to relocate a nest. See *Natural Communities* for Measures **BIO-GEN-1** through **BIO-GEN-16**.
Threatened and Endangered Species	**BIO-TURTLE-1:** *Northwestern Pond Turtle Preconstruction Surveys*. A USFWS-approved biologist will conduct a preconstruction survey to ensure northwestern pond turtles are absent from the proposed impact area prior to any ground disturbance at the following locations: • Pacheco Boulevard area near Pacheco Creek (PM 22.5 – PM 21.8) • I-680/State Route (SR) 4 interchange near Grayson Creek (PM 21.0 – PM 20.9) • Willow Pass Road to Monument Boulevard near Walnut Creek (PM R19.2 and PM R18.2) • Rudgear Road to Livorna Road near San Ramon Creek (PM R12.7 and PM R11.3) If a northwestern pond turtle is observed in any proposed impact area, ground disturbance would not commence until the turtle leaves the proposed impact area on its own. **BIO-OWL-1:** *CDFW Protocol Surveys*. A Caltrans-approved biologist will conduct burrowing owl surveys in brome grassland habitat in and within 500 meters (1,640 feet) of the Biological Study Area (if accessible) following CDFW's protocols (CDFW 2012) in the year prior to ground disturbance. Surveys will be repeated if construction is delayed or suspended for more than 30 days. If an occupied burrow or structure is discovered, the biologist will establish an appropriately sized buffer around it following CDFW's 2012 guidelines. **BIO-FWS-1:** *Listed Species Observation*. If California red-legged frog, Alameda whipsnake, or another listed species is discovered in the Project footprint, any off-pavement construction activities within 1,000 feet of the discovery will stop, and Caltrans will contact USFWS within one working day to determine if formal consultation should be completed prior to resuming activities. Notification will include the date, time, and location of the incident or the finding of a deceased or

Affected Resource	Avoidance, Minimization, and/or Mitigation Measures
	injured animal, clearly indicated on a 7.5-minute quadrangle and other maps at a finer scale as requested by USFWS and any other pertinent information. **BIO-FWS-2:** *Preconstruction Surveys*. Preconstruction surveys will be conducted for California red-legged frog and Alameda whipsnake by the USFWS-approved biologist immediately prior to ground-disturbing activities within or adjacent to suitable habitat, including vegetation removal, within the Action Area. These efforts will consist of walking surveys of the Project limits and accessible areas within at least 25 feet of the Project footprint. The USFWS-approved biologist will investigate areas of disturbed soil for signs of listed species within 30 minutes following initial disturbance of the given area. Preconstruction surveys should be conducted in the following areas: • PM 22.5 – PM 21.8: Pacheco Boulevard area – between the work limits on the northbound side of I-680 and the habitat associated with Pacheco Creek to the north and east, as well as between the work limits on the southbound side of I-680 and its on-ramp from Pacheco Boulevard and the habitat associated with the unlined channel tributary to Pacheco Creek. • PM 21.0 – PM 20.9: I-680/SR-4 interchange area – between the work limits on the southbound side of I-680 and its on-ramp from SR-4 and the habitat associated with Grayson Creek to the south. • PM R19.2 – PM R18.2: Willow Pass Road to Monument Boulevard area – between the work limits on the northbound side of I-680 and the habitat associated with Walnut Creek to the east. **BIO-FWS-3:** *Rain Restrictions.* No work will occur within or adjacent to suitable listed species habitat 24 hours before, during, and 24 hours after a rain event. A qualifying rain event is defined to be any storm that produces or is forecasted to produce at least 0.50 inch of precipitation at the time of discharge, with a 48-hour dry period between events as measured by the National Oceanic and Atmospheric Administration National Weather Service for the Contra Costa County (WNG655) station. These areas will be fully surveyed by a USFWS-approved biologist for special-status species prior to the continuation of work. **BIO-FWS-4:** *Post-Construction Report.* Caltrans will submit a post-construction compliance report to USFWS within 60 calendar days following completion of the proposed Project. This report shall detail: (1) Dates that relevant Project activities occurred; (2) Pertinent information concerning the success of the Project in implementing conservation measures; (3) An explanation of failure to meet such measures, if any; (4) Known Project effects on the California red-legged frog and Alameda whipsnake; (5) Habitat impacts that occurred during construction, including any tree or shrub removals that occurred; (6) Revegetation activities that occurred to temporarily impacted areas; (7) Lighting installed and a determination on whether the light spread from the new permanent lighting fixture matches up with the projected light spread in the Biological Assessment; (8) Documentation of employee environmental education; and (9) Any other pertinent information.

Affected Resource	Avoidance, Minimization, and/or Mitigation Measures
	See *Natural Communities* for Measures **BIO-GEN-1** through **BIO-GEN-16** and *Animal Species* for **BIO-BEE-1**.
Invasive Species	See *Natural Communities* for Measures **BIO-GEN-1** through **BIO-GEN-16**.
Cumulative Impacts (CEQA only)	No additional measures.
Wildfire (CEQA only)	See *Utilities/Emergency Services* for Measure **UES-3**.
Climate Change (CEQA only)	See *Air Quality* for Measures **AQ-1**, **AQ-3**, and **AQ-5**. See *Energy* for Measures **E-1** and **E-2**. See *Traffic and Transportation* for Measures **TRAN-MM-1**, **TRAN-MM-2**, and **TRAN-MM-3**.

Summary of Significant Impacts under California Environmental Quality Act

Under CEQA, an EIR must be prepared whenever substantial evidence in the record supports a fair argument that a project would have a significant effect on the environment. Caltrans has not adopted thresholds of significance under CEQA. As a statewide agency covering diverse geographic areas, Caltrans has, as a matter of policy, left the determination of significance to the Caltrans' District PDT members. The use of the term "thresholds of significance" is not to be used for projects on the State Highway System.

As discussed in Section 3.2.4, *Biological Resources*, Caltrans has determined that the Project, with mitigation, would result in a less than significant impact on biological resources. The following mitigation measures would be implemented:

- **BIO-MM-1:** Oak Woodlands
- **BIO-MM-2:** Jurisdictional Waters

As discussed in Section 3.2.17, *Transportation*, Caltrans has determined that the Project would result in a significant and unavoidable impact on transportation under CEQA. According to Caltrans *Transportation Analysis under CEQA*, Second Edition (2025), a project within a metropolitan planning organization area "that results in an increase in VMT when comparing the future build alternative to the future no-build alternative (i.e., the VMT is higher under the future build scenario) will generally be considered significant, and mitigation will be required." The following VMT mitigation measures would be implemented for the Project:

- **TRAN-MM-1:** I-680 Express Bus Service
- **TRAN-MM-2:** Shared Mobility Hubs
- **TRAN-MM-3:** Transportation Demand Management Program Augmentation

Section 3.2.17, *Transportation*, was revised to include additional details regarding the VMT mitigation strategies evaluated and funding. Subject to available funding, the mitigation measures would offset the Project's daily VMT for a period of 20 years and could result in a mode shift that would extend beyond the 20-year period. However, Caltrans has determined that the impact would be individually and cumulatively significant and unavoidable under CEQA because mitigation funding has not been fully secured, and indefinite ongoing mitigation funding is not assured.

All other effects were found not to be significant. Findings for all significant impacts identified and a Statement of Overriding Considerations for Alternative 2 will be considered prior to Project approval.

Regulatory Changes Since the Draft Environmental Document

The Draft EIR/EA was available for public review from May 8, 2024, through June 24, 2024. This section describes some of the regulatory changes that occurred following the public comment period.

The monarch butterfly (*Danaus Plexippus*), which was identified as a candidate species in the Draft EIR/EA, was proposed for listing as a federal threatened species in December 2024. Meanwhile, the western burrowing owl (*Athene cunicularia hypugaea)*, which was identified as a California Species of Special Concern in the Draft EIR/EA, was listed as a candidate species under the California Endangered Species Act in October 2024.

Caltrans completed informal Project consultation with the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the Federal Endangered Species Act in May 2025. General and species-specific measures were revised and updated to be consistent with the USFWS Letter of Concurrence (see Appendix F), which was received in May 2025. In addition, Measures **BIO-FWS-1** through **BIO-FWS-4** were added to the list of avoidance, minimization, and mitigation measures. Compensatory mitigation was not required.

EO 14154*, Unleashing American Energy* (2025), among other things, rescinded EO 11991, *Relating to Protection and Enhancement of Environmental Quality* (1977). In compliance with EO 14154, the Council on Environmental Quality (CEQ) issued an interim final rule on February 25, 2025, removing regulations implementing NEPA from the Code of Federal Regulations, which became effective on April 11, 2025. On February 19, 2025, the CEQ prepared a memorandum that recommended agencies not delay ongoing NEPA analysis, to follow existing procedures consistent with EO 14154 for the time being, and to revise their NEPA procedures within 12 months, with CEQ assistance. In addition, EO 14173, *Ending Illegal Discrimination and Restoring Merit-Based Opportunity* (January 21, 2025), rescinded EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (1994); and EO 14148, *Initial Rescissions of Harmful Executive Orders and Actions* (2025), rescinded EO 14096, *Revitalizing Our Nation's Commitment to Environmental TJustice* (April 21, 2023).

Caltrans has since released interim guidance regarding the consideration of environmental justice, equity, climate change, and cumulative impacts in NEPA documents. References to the revoked CEQ regulations and the consideration of environmental justice, equity, climate change, and cumulative impacts were included in Chapter 2 of the Project's Draft EIR/EA and have therefore been retained for informational purposes only. Climate change and cumulative impacts are still evaluated under CEQA (Chapter 3). Section 3.5, *Cumulative Impact*, was added following public circulation of the Draft EIR/EA per Caltrans' new interim guidance on cumulative impact analysis. FHWA released an interim final rule to modify the regulations implementing NEPA on July 3, 2025 (90 Federal Register 29426).

PERMITS AND APPROVALS NEEDED

The following permits, licenses, agreements, and certifications (PLAC) are required for Project construction:

Table S-3. Permits and Approvals

Agency	Permit/Approval	Status
United States Fish and Wildlife Service (USFWS)	Section 7 Consultation for threatened and endangered (terrestrial) species	Concurrence letter from USFWS was received, dated May 7, 2025, following informal consultation (see Appendix F.6).
U.S. Army Corps of Engineers (USACE)	Preliminary Jurisdictional Determination for jurisdictional wetlands and waters of the United States Section 404 Permit for filling or dredging waters of the United States	A preliminary jurisdictional delineation application was submitted to USACE for concurrence on October 12, 2023, and resubmitted on February 15, 2024. Preliminary jurisdictional determination was received, dated September 12, 2024 (see Appendix F.4). Nationwide Permit 14 preconstruction notification would be submitted during the design phase.
California Department of Fish and Wildlife (CDFW)	Section 1602 Agreement for Streambed Alternation Section 2080.1 Agreement for Threatened and Endangered Species	Applications for Section 1602 will be submitted to CDFW after Final Environmental Document approval, during the design phase. Incidental take of CDFW listed species is not currently anticipated.
San Francisco Bay Regional Water Quality Control Board (RWQCB)	Clean Water Act Section 401 Water Quality Certification or Waste Discharge Requirements (WDR) National Pollution Discharge Elimination System (NPDES)	Water Quality Certification or WDR will be sought from RWQCB during the final design phase. NPDES application will be submitted in the design phase, prior to construction. Notice of Intent and Storm Water Pollution Prevention Plan will be prepared and submitted prior to construction.
State Historic Preservation Officer (SHPO)	National Historic Preservation Act Section 106 consultation	Concurrence letter from SHPO received, dated April 17, 2024 (see Appendix F.3).
Air Quality Conformity Task Force	Project of Air Quality Concern Determination	Task Force determined the Project was not a project of air quality concern on December 19, 2023 (See Appendix F.1).

Agency	Permit/Approval	Status
Federal Highway Administration (FHWA)	Clean Air Act Conformity Determination	Air Quality Conformity Application was submitted to FHWA following public review of the Draft EIR/EA. FHWA approval received via letter, dated June 23, 2025 (see Appendix F.1).
Official(s) with Jurisdiction	Section 4(f) *De Minimis* Concurrences	Notification letter was sent to SHPO regarding Caltrans *de minimis* impact determination for the Bay Area Rapid Transit (BART) property as part of the Section 106 consultation. Concurrence was received from East Bay Parks regarding the *de minimis* impact determination for the Iron Horse Regional Trail and the Contra Costa Canal Trail/ Briones to Mount Diablo Regional Trail, dated October 30, 2024 (see Appendix A).
California Transportation Commission (CTC)	CTC vote to approve Project funds	Following Caltrans' approval of the Final Environmental Document and posting the Notice of Determination with the State Clearinghouse, CTC approval will be required to allocate any CTC-managed funding for the Project.
BART	Construction Permit/Plan Review	Additional coordination with BART will be conducted and an application will be submitted during design phase.
California Department of Transportation (Caltrans)	Encroachment Permit(s)	Encroachment permits would be needed for investigations conducted during the design phase and for construction activities within Caltrans right-of-way (ROW).
Contra Costa County Public Works and other Local Agencies	Encroachment Permit(s) and/or Right(s) of Entry	Encroachment permit(s) and/or right(s) of entry would be needed for investigations conducted during the design phase and/or construction activities within County or City ROW.

AREAS OF KNOWN CONTROVERSY

The scoping period for the Project was from June 15 through July 29, 2020. The Notice of Preparation was posted at the State Clearinghouse (SCH #2020060297) on June 15, 2020, and public notices were published in the *East Bay Times*. In addition, a postcard mailer was mailed on June 12, 2020, to 7,067 homeowners within 1,000 feet of the I-680 corridor. Additional public notices were circulated electronically to public agencies and other key stakeholders on June 17, 2020. For the public's convenience, and to allow participation in a safe environment while social distancing, a virtual public meeting (open house) was available throughout the public scoping period.

A total of 15 written comments were received during the scoping period, which included comments from the City of Walnut Creek, California Department of Fish and Wildlife, California Highway Patrol, Native American Heritage Commission, and the public. Key issues raised during the Project's scoping process include the Project's purpose and need, alternatives and Project features being considered, and impacts on transportation, equity, greenhouse gas emissions, air quality, and noise/sound walls.

Alternatives 1C, 2, 3, and 5 were carried forward for evaluation in the draft environmental document. All Build Alternatives were developed to avoid impacting existing Bay Area Rapid Transit columns within I-680 at the SR-24 Interchange through either realigning southbound I-680 (Alternatives 1C and 3) or retaining a 2-mile gap in managed lanes at the interchange (Alternatives 2 and 5).

The Draft EIR/EA was available for public review from May 8, 2024, through June 24, 2024. A Notice of Availability, Notice of Completion, and an electronic version of the draft environmental document were posted on the State Clearinghouse's CEQAnet on May 7, 2024, and at the Contra Costa County Clerk's Office. Notifications of the draft environmental document and the public meetings/hearings were published in the *East Bay Times*, *Sing Tao*, *El Observador*, and *Mercury News*. A postcard mailer was mailed on May 8, 2024, to 484 stakeholders and 7,256 properties. An in-person public meeting/hearing was held on June 5, 2024, and a virtual public meeting/hearing was held on June 6, 2024.

Areas of known controversy that have been addressed in this environmental document include the following: support or opposition for the Project or a specific build alternative; the Project's purpose and need; traffic impacts, including VMT; air quality, greenhouse gas emissions, and climate change; impacts on biological resources and habitat connectivity; noise impacts and abatement (i.e., sound walls); and construction impacts, including temporary ramp closures and recreational trail detours. The consideration of Alternative 5 garnered the most public controversy, and it was ultimately not selected as the preferred alternative. While the traffic impacts are currently unresolved, early and continuing coordination with the general public and regulatory agencies is expected to resolve these concerns.

Refer to Section 4, *Comments and Coordination*, for more information.

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Chapter 1 Proposed Project

1.1 INTRODUCTION

The Contra Costa Transportation Authority (CCTA), in cooperation with the California Department of Transportation (Caltrans), proposes to complete the Interstate 680 (I-680) express lane network in Contra Costa County, California, to improve system continuity, relieve congestion, and improve operations.

The I-680 Northbound Express Lane Completion Project (Project) is part of the CCTA INNOVATE 680 Program, which seeks to implement a suite of projects that, when operating together, would address corridor-wide congestion, travel delays, and operational challenges. The post mile (PM) limits for the Project on I-680 are from PM R10.7 at the southern limit to PM 23.1 at the northern limit. More than one Build Alternative is under consideration for the Project, including the construction of a northbound express lane between Livorna Road and State Route (SR) 242. The Project would also convert the existing northbound high-occupancy vehicle (HOV) lane from SR-242 to north of Arthur Road to an express lane.

The Project is subject to both State and federal environmental review requirements. Project documentation is being prepared in compliance with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). Caltrans, as assigned by the Federal Highway Administration (FHWA), is the lead agency under NEPA. Caltrans is also the lead agency under CEQA. CCTA is the Project Sponsor.

The Project is included in the Association of Bay Area Governments and MTC's *Plan Bay Area 2050*, the Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) for the nine-county San Francisco Bay Area (Association of Bay Area Governments and Metropolitan Transportation Commission, 2021). Plan Bay Area 2050 was adopted on October 21, 2021. The Project is an element of MTC's Express Lanes Regional Program (21-T12-116). Plan Bay Area 2050 provides the following description for this program:

> *This program includes funding to implement express lanes through HOV lane conversions on I-80 (ALA, CC), I-280 (SCL), I-680 (CC), I-880 (SCL), US-101 (SCL), SR-4 (CC), SR-84 (ALA), SR-85 (SCL), SR-87 (SCL), and SR-92 (ALA); partial HOV lane conversions on I-80 (SOL), I-280 (SF), I-680 (CC), and US-101 (SF); freeway lane conversions on I-80 (SOL), I-280 (SCL), I-580 (ALA), I-680 (SCL), and I-880 (ALA); new lanes on I-80 (SOL), I-680 (ALA, CC), I-880 (ALA), and US-101 (SM); new dual lanes with HOV lane conversions on SR-85 (SCL); and new dual lanes on US-101 (SCL).*

The Project is also included in the *2025 Proposed Final Transportation Improvement Program* (TIP), which MTC approved on September 25, 2024, as CC-170017 (Metropolitan Transportation Commission, 2022). The 2025 TIP provides the following description for the Project:

> *Contra Costa County : I680 NB from Livorna Rd to Arthur Rd : 1) From Livorna Rd to SR-242: Extend Managed Lane; 2) From SR-242 to Arthur Rd: Convert Existing HOV Lane to Express Lane; 3) From N Main St to Treat Blvd: Operational improvements; and 4) Various locations along NB I-680: Install limited access buffers.*

The *2025 Federal Statewide Transportation Improvement Program* (FSTIP) was approved in December 2024 (Federal Highway Administration and Federal Transit Administration, 2024).

1.2 PROJECT LOCATION AND SETTING

Figure 1-1 shows the regional Project location and vicinity. I-680 is a major north-south freeway that passes through Santa Clara, Alameda, Contra Costa, and Solano Counties. The Project is located in Contra Costa County, within the cities of San Ramon, Walnut Creek, Pleasant Hill, Concord, and Martinez and the communities of Alamo, Acalanes Ridge, Pacheco, and Waldon.

Figure 1-2 provides the Project Study Limits for the Project. The Project Study Limits include all potential work areas for the Project. As such, the Project Study Limits extend slightly beyond the PM limits from just south of Stone Valley Road (PM R10.0) to north of Arthur Road (PM 23.2). The Project is located in an urbanized area with residential and commercial development south of SR-4 and industrial and residential areas north of SR-4. As described further in Section 1.4.6, *Alternatives Considered but Eliminated from Further Discussion Prior to Draft Environmental Impact Report/ Environmental Assessment*, the Project's total length was reduced from PM R4.4/24.5 in October 2023.

Within the Project Study Limits, I-680, in its existing configuration, is a divided freeway separated by a concrete median barrier. Northbound I-680 currently has two types of managed lanes—HOV lanes and express lanes. An express lane is in operation currently on northbound I-680 from Alameda County (i.e., south of Alcosta Boulevard) to Livorna Road. An HOV lane is provided from north of the SR-242 junction to south of the Benicia-Martinez Bridge. There is an existing 7.5-mile gap in managed lanes on northbound I-680 between Livorna Road and the SR-242 junction. An express lane is also in operation along southbound I-680.

The I-680 roadway profile is generally level with minimal grades. Northbound I-680 from Livorna Road to Marina Vista Avenue contains three to five general-purpose (mixed flow) lanes that vary from 11 to 12 feet in width and one 11- to 12-foot-wide HOV lane north of SR-242. Auxiliary lanes generally span from one interchange to the next, while accelerating and decelerating lanes span only one portion of an interchange.



Figure 1-1. Regional Location and Project Vicinity

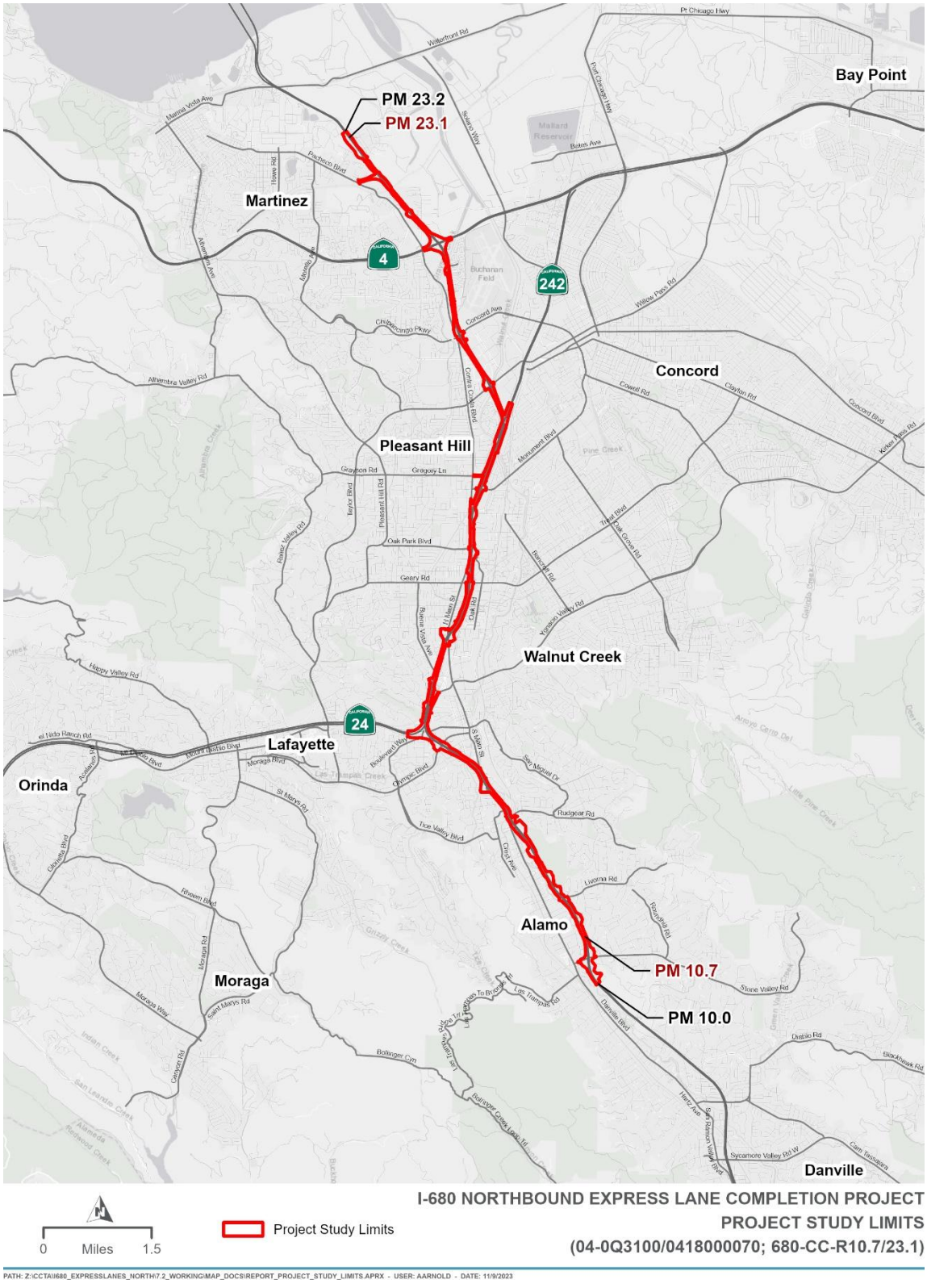


Figure 1-2. Project Study Limits

The freeway is supplemented with auxiliary lanes from Willow Pass Road to Burnett Avenue, Treat Boulevard to Monument Boulevard, Lawrence Way to Treat Boulevard, Diablo Road to El Cerro Boulevard, and Bollinger Canyon Road to Crow Canyon Road. Inside shoulder widths along I-680 vary from 2 to 10 feet, and outside shoulder widths are approximately 10 feet with localized reductions at structures.

The corridor contains several design constraints, such as center columns to support overcrossing structures, structure abutments, adjacent frontage roads, retaining walls, and sound walls. The most notable constraints are the columns for the Bay Area Rapid Transit (BART) overcrossing of I-680 just north of the SR-24 Interchange. Three northbound California Highway Patrol (CHP) median observation areas also exist within the Project Study Limits.

I-680 has been officially designated as a State Scenic Highway from the Alameda/ Contra Costa County Line to the I-680/SR-24 Interchange. SR-24 is officially designated as a State Scenic Highway west of I-680. Segments of I-680 within the Project Study Limits are also designated as a Landscaped Freeway.

1.3 PURPOSE AND NEED

1.3.1 Project Purpose

The purpose of the proposed Project is to:

- Reduce peak-period congestion and delay on northbound I-680.
- Encourage use of high-occupancy vehicles (HOV) and transit services.
- Offer non-carpool eligible drivers a reliable travel time option.
- Optimize use of the existing HOV lane capacity in the I-680 corridor to better meet current and future traffic demands.
- Reduce travel time and improve travel time reliability for travelers in the corridor.

1.3.2 Project Need

The need for the Project to address existing transportation problems within the Project Study Limits are:

- **Congestion** – Northbound I-680 general-purpose lanes within the Project Study Limits experience substantial congestion – over 30 minutes of delay – during peak hours.
- **System Continuity** – There is a 7.5-mile gap in the existing northbound I-680 managed lane system between Livorna Road and SR-242; system continuity

is lacking through this area, diminishing the effectiveness of the managed lane system and increasing travel time for all users.

- **Operational Improvements** – The weaving movement between Lawrence Way and Treat Boulevard creates a bottleneck on I-680 and a traffic queue as far back as Livorna Road during the afternoon peak traffic period. The situation is compounded by the gap in the managed lane system.

The northbound I-680 general-purpose lanes within the Project Study Limits experience congestion during peak periods. Speed and travel times throughout the corridor would continue to degrade in the future, while the HOV lane currently has, and would continue to have, available capacity to accommodate forecasted increases in travel demand through the Project's Design Year (2047). The Project is intended to shift single-occupancy vehicle (SOV) drivers choosing to pay a toll from the general-purpose lanes to the proposed express lane, thereby optimizing the use of the existing HOV lane and offering more reliable travel time options.

Additional details regarding existing and projected congestion and bottlenecks are provided in Section 2.1.8, *Traffic and Transportation/Pedestrian and Bicycle Facilities*.

1.3.3 Legislation

The following legislation is applicable to the proposed Project:

Assembly Bill (AB) 194, Chapter 687 (amending Section 149.7 and 149.12) of the California Streets and Highways Code, which was passed in 2015, allows regional transportation agencies and Caltrans to develop and operate express lanes or other toll facilities. The legislation removes the prior limits on the number of facilities and the approval deadline. The legislation created the Highway Toll Account in the State Transportation Fund to manage funds received for toll facilities operated by Caltrans. Before 2016, tolling authority in California was granted typically only through legislation that specifically authorized an entity to implement a tolled facility.

23 United States Code (USC) 166 provides rules for operation of HOV facilities and high-occupancy toll (HOT) facilities by a public authority (any federal, State, county, town, municipal, or other local government with authority to finance, build, operate or maintain toll or toll-free facilities). 23 USC 166 provides the public authority the ability to define the number of occupants in a qualified HOV (as long as it is no fewer than two occupants per vehicle); restrict motorcycle use of an HOV or HOT facility for safety, as needed; and allow or restrict public transportation vehicles on the HOV or HOT facility. 23 USC 166 requires these lanes to maintain a 45-miles per hour (mph) minimum average operating speed (90 percent of the time over a consecutive 180-day period). The public authority has several options they can use to increase operating speed performance if this average operating speed is not met, including the following:

- Increasing the occupancy requirements for HOVs
- Vary the toll charged to vehicles
- Limiting the lane to HOVs only

23 USC 301 prohibits tolls on federal highways, unless otherwise authorized by 23 USC 129. 23 USC 129 authorizes the federal participation in projects that impose new tolls on federal highways under certain circumstances. For example, 23 USC 129 allows for the conversion of HOV lanes to a toll facility for a highway, bridge, or tunnel on the interstate system. In addition, 23 USC 129 allows for the initial construction of one or more lanes or other improvements that increase the capacity of a highway, bridge, or tunnel on the interstate system and the conversion of that highway, bridge, or tunnel to a toll facility, as long as the number of toll-free, non-HOV lanes (i.e., general-purpose lanes) following construction is not less than the number of toll-free, non-HOV lanes prior to construction, not including auxiliary lanes.

1.3.4 Logical Termini and Independent Utility

FHWA regulations (23 Code of Federal Regulations [CFR] 771.111 [f]) require that the action evaluated:

1. Connect logical termini and be of sufficient length to address environmental matters on a broad scope.
2. Have independent utility or independent significance (be usable and be a reasonable expenditure even if no additional transportation improvements in the area are made).
3. Not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

Logical termini are defined as (1) rational end points for a transportation improvement, and (2) rational end points for a review of the environmental impacts. The PM limits for the Project on I-680 are from post PM R10.7 at the southern limit to PM 23.1 and encompass the operational improvements for the Project. As part of the traffic operations analysis conducted for this Project, these limits were chosen based on the limits of existing express lanes along I-680 in Contra Costa County and include the HOV lane that runs from SR-242 to south of the Benicia -Martinez Bridge Toll Plaza.

The Project Study Limits on I-680 are from PM R10.0 at the southern limit to PM 23.2 at the northern limit. The Project Study Limits fully encompass the 7.5-mile gap in managed lanes, the existing HOV lanes on northbound I-680, and all potential work areas for the Project. As described further in Section 1.4.6, *Alternatives Considered but Eliminated from Further Discussion Prior to Draft Environmental Impact Report/ Environmental Assessment*, the PM limits and Project Study Limits were reduced in October 2023. Appendix I, *Project Feature Figures and Impact Maps*, shows the Project

Study Limits in relation to proposed Project features and impact areas for the Build Alternatives that are being carried forward for evaluation.

Independent utility, or independent significance, is defined as being a usable and reasonable expenditure even if no additional transportation improvements are made in the area. The proposed Project would not require any additional transportation improvements in the Project area to meet the purpose and need. Accordingly, the Project is a usable and reasonable expenditure.

Approving the Project would not restrict consideration of alternatives for this or other reasonably foreseeable transportation improvements. CCTA is the county transportation authority and Project Sponsor. The Project is being designed in coordination with other local and regional transportation authorities in the area. Continuous coordination would avoid potential conflicts with proposed alternatives and other planned area transportation improvements.

1.4 PROJECT DESCRIPTION

This section describes the proposed action and the Project alternatives developed to meet the purpose and need of the Project, while avoiding or minimizing environmental impacts. The Project alternatives are as follows:

Build Alternative 1C:	Close the Gap with Realignment
Build Alternative 2:	Reduce the Gap Plus Braided Ramps
Build Alternative 3:	Close the Gap with Realignment Plus Braided Ramps
Build Alternative 5:	Reduce the Gap with General-Purpose Lane Conversion Plus Braided Ramps
No-Build Alternative:	The No-Build Alternative does not include any improvement on I-680.

Alternative 2 has been selected as the preferred alternative for the Project.

The Project Study Limits are just south of Stone Valley Road (PM R10.0) to north of Arthur Road (PM 23.2). The total Project length is approximately 13.2 miles. All Build Alternatives include the creation of a northbound express lane (in various lengths) between Livorna Road and SR-242 (PM R11.30 to R18.87) and conversion of an existing HOV lane to an express lane north of Aurthur Road (PM R18.87 to R22.87). Within this area, northbound I-680 from Livorna Road to Marina Vista Avenue is an interstate freeway that contains three to five general-purpose (mixed flow) lanes. On northbound I-680, express lanes currently end around Livorna Road. There is a 7.5-mile gap in managed lanes (i.e., HOV and express lanes) between Livorna Road and the SR-242 junction. HOV lanes are currently operational from SR-242 to south of the Benicia-Martinez Bridge Toll Plaza. There are also operating express lanes on southbound I-680 between Alcosta Boulevard and Marina Vista Road.

The purpose of the Project is to reduce peak-period congestion and delay on northbound I-680, encourage HOV and transit service use, offer non-carpool eligible drivers a reliable travel time option, optimize use of the existing HOV lane capacity in the I-680 corridor to better meet current and future traffic demands, and reduce travel time and improve travel time reliability for travelers in the corridor.

The following subsections describe the Build Alternatives and the No-Build Alternative in more detail. Alternatives that were considered but eliminated from evaluation are described in Section 1.4.6, *Alternatives Considered but Eliminated from Further Discussion Prior to Draft Environmental Impact Report/ Environmental Assessment*.

Appendix I, *Project Feature Figures and Impact Maps*, contains detailed exhibits of proposed improvements and impact areas for each Build Alternative.

1.4.1 Common Design Features of the Build Alternatives

1.4.1.1 Express Lane Operations

All eligible vehicles would be able to use the express lane during the hours of operation. HOVs, motorcycles, buses, and decal vehicles, as authorized by the California Air Resources Board, would be eligible express lane users. Depending on the operational business rules, these vehicles may travel for free or may incur a reduced fee, which is discussed in more detail below. The proposed express lane is expected to operate with a vehicle occupancy requirement of two or more (2+) persons per HOV, unless a different vehicle occupancy is decided. SOV drivers would also be eligible to use the express lane for a toll. Trucks or other vehicles with three or more axles would be excluded from the express lane.

It is currently anticipated that the hours of operations would be the same as other existing express lanes on I-680, which is from 5:00 a.m. to 8:00 p.m., Monday through Friday. The express lane would operate like a general-purpose lane outside of these hours.

Additional details regarding the proposed express lane's operation are provided below.

Pricing and Tolling

Tolling would operate similar to the existing express lanes on I-680. The tolling operation would be fully electronic, with no ability to stop and make payments at a toll plaza. Tolls are assessed to users based on FasTrak® transponders and/or license plates. All vehicles in the express lane must have FasTrak® License Plate Recognition. Cameras would capture vehicle license plate images and assess tolls to a valid FasTrak® account or issue toll violation notices if no valid account is associated with the vehicle.

Metropolitan Transportation Commission (MTC) is the Metropolitan Planning Organization for the Bay Area. The Bay Area Infrastructure Financing Authority (BAIFA) delivers, owns, and operates the express lanes toll system, and sets toll pricing in the

Bay Area. Tolls for express lanes are dynamic, meaning they change periodically based on real-time traffic volumes. During periods of lower traffic congestion, the toll would be lower to encourage SOVs to pay the toll and use the additional express lane capacity. During periods of higher traffic congestion, the toll would be higher to discourage SOVs from using the express lane. Toll increases for SOVs would be used to meet the minimum average operating speed of 45 mph for HOVs (23 USC 166[d][2]). Qualifying HOVs, Clean Air Vehicles (CAV), and motorcycles with a properly set FasTrak® Flex or FasTrak® CAV toll tag would travel free or at a discounted rate. Outside of the hours of operation, the express lane would operate as a general-purpose lane, open to all users for no toll.

The following is a summary of actions the Bay Area Toll Authority (BATA) (operator of the FasTrak® Regional Customer Service Center) and BAIFA have taken to reduce the financial burden on FasTrak® customers to date. These are current features of all existing express lanes in the Bay Area.

Spring 2022 (BATA):

- Dropped the cost of the FasTrak® toll tag deposit for new customers who choose not to link their account to a credit card to $5 from the previous $20.
- Credited $15 to the prepaid toll accounts of existing customers who paid a $20 tag deposit.
- Reduced the minimum opening balance for a FasTrak® account for customers who pay with cash or check to $25 from the previous $50.
- Eliminated transaction fees for customers who replenish FasTrak® accounts or pay violation penalties at a cash network location.

Effective October 3, 2022 (BAIFA):

- Reduced violation penalties from $25 for the first notice plus an additional $45 for the second notice to $10 for the first notice plus an additional $20 for the second notice.

July 1, 2023 (BATA established, BAIFA adopted):

- Established the Bay Area Toll Payment Plan for individuals with outstanding toll debt whose household income is no more than 200 percent of the federal poverty level (about $60,000 for a family of four). The payment plan is open to anyone with a qualifying lower income who has received toll violations on Bay Area bridges or Express Lanes.
- For those who qualify, all violation penalties are waived on a one-time basis, and any remaining balance of at least $100 can be paid off over time in the payment plan.

July 24, 2024 (BATA):

- The minimum replenishment for cash/check customers was lowered to $25 per toll tag and the replenishment threshold to $15 to align with the credit card amounts.

Enforcement

All Build Alternatives include the installation of overhead signs, toll gantries, toll readers and antennas, vehicle sensors, rear-plate facing cameras, enforcement beacons, closed-circuit television cameras, zone controllers, utility cabinets, CHP enforcement areas, and maintenance vehicle pullouts within the Project Study Limits.

The tolling operation would be fully electronic, with no ability to stop and make payments at a toll plaza. Tolls are assessed to users based on FasTrak® transponders and/or license plates. License Plate Recognition cameras would capture vehicle license plate images and assess tolls to a valid FasTrak® account or issue toll violation notices if no valid account is associated with the vehicle.

Although the use of License Plate Recognition and toll transponders would automate toll violations, CHP is responsible for enforcing all laws that apply to the express lane, including toll and HOV violations. Toll violations would be enforced through an automated violation process. Toll gantries would be installed at the beginning and end of the proposed express lane, near the SR-242 Interchange, and at the SR-24 Interchange (Alternatives 1C and 3).

Vehicles with a valid FasTrak® transponder would trigger a transaction indicator beacon. CHP officers would monitor the indicator beacon and observe from a distance whether the identified vehicle is self-declaring its status as SOV, HOV2 (a driver and one additional passenger), HOV3+ (a driver and two or more additional passengers), or if the vehicle does not have a valid FasTrak® transponder. If CHP determines that a driver is self-declaring (via FasTrak® transponder) a higher occupancy than observed in the vehicle, or if the vehicle does not have a valid FasTrak® transponder or a properly mounted and readable license plate, the vehicle may be pulled over and cited.

Existing CHP enforcement locations would be retained to allow CHP enforcement of the express lane. One new CHP area would be located in the vicinity of the SR-242 Interchange for northbound I-680 express lane enforcement under Alternatives 1C, 2, and 3. The final locations would be identified in coordination with CHP during the Project's final design phase and would consider line of sight and officer and vehicle safety. A tentative CHP area is proposed in the highway median that would be approximately 115 feet long and vary between 10 and 14 feet wide.

Signage

The proposed express lane would include several types of signs to provide graphic or text messages that inform motorists of pricing by toll zone and operating rules. As depicted in Appendix I, *Project Feature Figures and Impact Maps*, the overhead sign

structure locations would vary by alternative. Smaller signs would be mounted on the concrete median barrier. Larger signs would be mounted on cantilevered overhead sign structures spanning above the express lane. The total height of the overhead sign structure (including the sign) would depend on the type of sign being mounted. The sign types are summarized below.

- **Variable Toll Message Sign (VTMS)** – Electronic message signs would display two prices: one for the zone the driver is entering and the other for traveling to an upcoming destination in the express lane facility. The prices shown upon a driver's entry into the express lane would apply regardless of whether they change during the driver's trip as a result of increased (or decreased) levels of traffic. These signs would be mounted on overhead structures and be located approximately 2 miles apart, with additional signs placed in advance of the express lane facility, zone changes, and near on-ramps with heavy traffic volumes. The signs would have sensors that adjust the brightness of the toll cost numbers to ambient light conditions automatically, so that the light-emitting diode (LED) components are no brighter than needed for motorist visibility at any time.

- **Static/Nonelectrical Signs** – Sign panels indicating FasTrak® use only would be placed approximately 0.75 mile apart within each toll zone, no more than 0.5 mile after each VTMS, and at entrance ramps. Signs would also be placed at the start of the express lane and at the start of limited access locations. Among other things, static signs would provide the express lane hours of operation.

1.4.1.2 Utility Relocation, Rerouting, and Removal

Electrical utilities would be required to power overhead signs, toll gantries, toll readers and antennas, vehicle sensors, rear-plate facing cameras, enforcement beacons, closed-circuit television cameras, zone controllers, and utility cabinets. Electrical and communications conduits and fiber would be extended from existing sources along the outside edge of pavement or along local roads. Extending electrical and communication conduit and fiber would require trenching and/or horizontal directional drilling to bring these services to the electronic tolling equipment and signage. Installation of pull boxes, controller cabinets, and service enclosures for electrical and/or fiber optic conduits would also be required. The locations for proposed electrical service lines and cabinets would be determined in coordination with utility providers during final design. Potential locations have been identified for each Build Alternative.

Relocating overhead utilities could lead to temporary service interruptions. In addition, ground disturbance activities could damage existing utility infrastructure and lead to temporary service interruptions. See Section 2.1.7, *Utilities and Service Systems*, for more information regarding potential utility relocations, rerouting, or removals. In accordance with Section 4216 of the California Government Code, local utilities would be notified prior to ground disturbance.

1.4.1.3 Safety Lighting

All Build Alternatives would provide enhanced lighting to improve roadway visibility. Lighting may be upgraded at ramp merges and diverges, if necessary. Lighting would also be added to overhead signs, the express lane entrance, toll zone boundaries, locations on the highway where visibility is restricted by barriers, locations where the median width is narrow and drivers may be exposed to headlight glare, and locations where concentrations of nighttime collisions are known to have occurred. Although preliminary locations have been identified for the purpose of this evaluation, the exact locations of new lighting would be determined during the final design phase. The lighting would have LEDs configured at the minimum necessary illumination level and optimal angle to restrict light to the freeway right-of-way (ROW). Shields on the fixtures would be used to reduce light trespass to surrounding properties.

1.4.1.4 Permanent Stormwater Treatment

All Build Alternatives would include the installation of permanent best management practices (BMP) to avoid the potential for Project-related stormwater discharges to alter drainage patterns substantially, violate water quality standards, or degrade water quality substantially. All Build Alternatives propose biofiltration swales, designed for bioretention, with either trash nets or gross solids removal devices (GSRD) to provide stormwater treatment and achieve trash capture. For bioretention swales, retention would be achieved using an engineered soil mix and an underdrain system. The final location of permanent BMPs would be determined during the final design phase and be in compliance with permit requirements from regulatory agencies. Table 1-1 describes the potential permanent BMP locations that could be used for all Build Alternatives, all of which would be located within existing State ROW. BMP areas for each Build Alternative are also depicted in Appendix I, *Project Feature Figures and Impact Maps*.

Table 1-1. Proposed Permanent BMP Areas

PM	Side (NB/SB)	Potential Trash Capture Device	Location Description
R11.3	SB	GSRD	Livorna Road SB off-ramp
13.9	SB	GSRD	Olympic Ramp to I-680 S Entrance
14.8	NB	GSRD	NB I-680 Off Road Hillside Avenue
15.6	NB	GSRD	North Main Street Loop off-ramp
16.0	SB	TRASH NET	North of North Main Street off-ramp
16.0	NB	GSRD	North of North Main Street on-ramp
16.4	NB	GSRD	Treat Boulevard/Geary Road Exit
R17.3	NB	GSRD	Gore area of I-680 NB and Contra Costa on-ramp

PM	Side (NB/SB)	Potential Trash Capture Device	Location Description
R18.9	NB	GSRD	Before Willow Pass Road
19.1	SB	TRASH NET	Willow Pass Road off-ramp
19.15	SB	GSRD	After Willow Pass Road off-ramp
19.7	SB	TRASH NET	Between Willow Pass SB off-ramp and Concord Avenue on-ramp, where Golf Club Road dead-ends at I-680
19.7	NB	TRASH NET	South of Concord Avenue off-ramp
21.0	SB	TRASH NET	SR-4 EB / I-680 SB Connector
21.0	NB	TRASH NET	SR-4 EB to I-680 NB on-ramp
21.1	SB	GSRD	I-680 SB near SR-4
21.1	NB	TRASH NET	SR-4 EB / I-680 SB Connector Gore
21.1	SB	TRASH NET	South of Crow Canyon Road on I-680 NB
21.1	NB	TRASH NET	Next to SR-4 on-ramp from I-680 NB
21.1	SB	TRASH NET	I-680 SB off-ramp to SR-4 EB
21.2	NB	TRASH NET	Next to SR-4 off-ramp from I-680 NB
21.25	SB	TRASH NET	SR-4 WB to I-680 SB on-ramp
21.3	SB	GSRD	I-680 SB / SR-4 WB Connector Gore
22.4	SB	GSRD	Pacheco Road SB on-ramp

Notes: EB = eastbound, GSRD = gross solids removal devices, NB = northbound, PM = post mile, SB = southbound, SR = State Route, WB = westbound

1.4.1.5 Design Standards

Caltrans establishes and supports the consistent application of highway design standards to ensure optimal safety for the traveling public and those who work to construct, operate, and maintain the state highway system. Exceptions to these standards are necessary when the proposed design deviates from the standard design features presented in the Caltrans Highway Design Manual (California Department of Transportation, 2020). Chapter 21 of the Caltrans Project Development Procedures Manual (California Department of Transportation, 2022c) defines Boldface design standards as those considered most essential to achieving the overall design objectives. Underlined design standards are important and allow greater flexibility in application to accommodate design constraints or be compatible with local conditions on resurfacing or rehabilitation projects. The Project Study Limits contain existing, nonstandard design elements that do not meet current design standards. Exceptions to

Boldface and Underlined design standards would be required for all Build Alternatives to minimize environmental impacts.

1.4.1.6 Standardized Project Measures

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.

Each Project alternative includes the following standardized measures as part of the Project description. Standardized measures (such as BMPs) are generally applied to most or all Caltrans projects. These standardized, or pre-existing, measures allow little discretion regarding their implementation and are not specific to the circumstances of a particular project. More information on each measure can be found in the applicable sections of Chapter 2. The construction contractor would be required to follow all standard requirements and procedures included in detailed design, specifications, permits, or other authorizations.

Example standardized project measures that would be implemented as part of the Project are described below.

Transportation Management Plan

During the final design phase for the Build Alternatives, a Transportation Management Plan (TMP) would be prepared in accordance with Caltrans' requirements and guidelines to minimize construction-related delays and inconvenience for travelers in the Project area (California Department of Transportation, 2015). The TMP would address potential traffic impacts as they relate to staged construction, detours, and other traffic handling concerns associated with proposed Project construction. The TMP would include the following:

- Press releases and other documents would be distributed, as necessary, to notify local jurisdictions, agencies, and the public about upcoming road closures and detours.
- Contingency plans would be coordinated with CHP and local law enforcement.
- Portable changeable message signs, the CHP Construction Zone Enhanced Enforcement Program, and the Freeway Service Patrol would be used, where possible, to minimize delays.
- Access would be maintained for emergency response vehicles.

Highway Planting

Planting would be installed in areas where planting is removed for construction activities and to provide screening, where feasible. Highway planting and irrigation would follow completion of the roadway construction and could potentially be installed under a separate construction contract. A three-year, plant-establishment period would be included.

Erosion Control and Construction Discharges

The following standard practices for erosion control and construction discharges would be part of the Project for all Build Alternatives during construction:

- As part of construction, no debris, soil, silt, sand, bark, slash, sawdust, cement, concrete, washings, petroleum products, or other organic or earthen material shall be allowed to enter into or be placed where it may be washed by rainfall or runoff into waters of the United States or drainages. No discharges of excessively turbid water would be allowed, and all equipment would be well -maintained and free of leaks.

- A Stormwater Pollution Prevention Plan (SWPPP) and erosion control BMPs would be developed and implemented to minimize any wind or water-related material discharges, in compliance with Regional Water Quality Control Board (RWQCB) requirements, Section 13 of the 2022 Caltrans Standard Specifications (California Department of Transportation, 2022a), and Caltrans' Construction Site BMP Manual (California Department of Transportation, 2017). The SWPPP would provide water pollution control practices to limit stormwater and non-stormwater discharges. Temporary construction BMPs would be used to the maximum extent necessary.

- Erosion control methods may include silt fencing, straw wattles, straw bales, coir blankets, sediment traps, and other protective methods to limit the potential for sediment erosion beyond the work area.

Geotechnical Design Standards

Caltrans' design and construction guidelines incorporate engineering standards that address seismic risks. Project elements would be designed and constructed to meet seismic design requirements for ground shaking and ground motions, as determined for the Project vicinity and site conditions. Caltrans also requires additional geotechnical subsurface and design investigations to be performed during the final Project design and engineering phase.

Executive Order 13112

Compliance with Executive Order (EO) 13112 on invasive species is a standard practice that Caltrans adheres to for all projects. In compliance with EO 13112, and subsequent guidance from FHWA, the landscaping and erosion control included in the Project would

use species that are not listed as noxious weeds. The following methods would be used in accordance with standard construction practices:

- No disposal of soil and plant materials would be allowed from areas that support invasive species to areas dominated by native vegetation.
- Construction workers would be educated on weed identification and the importance of controlling and preventing the spread of identified, invasive, nonnative species.
- Gravel and/or fill material to be placed in relatively weed-free areas would come from weed-free sources. Certified weed-free imported materials (or rice straw in upland areas) would be used.

Species Protection

Caltrans Standard Specifications include several protective measures for regulated species and their habitat (California Department of Transportation, 2022a). For example, construction contractors would be required to stop all work within 100 feet of a discovery of a regulated species. Construction contractors are also required to stop all work upon the discovery an injured or dead bird or discovery of migratory or nongame bird nests that may be adversely affected by construction activities.

Cultural Resources, Human Remains, and Paleontological Resources

Construction contractors are required to stop all work within 60 feet of the unanticipated discovery of a cultural resource, human remains, or paleontological resource and to not resume work until authorized. Construction contractors are instructed to secure the area and not move or take cultural or paleontological resources or human remains from the job site until the discovery can be assessed.

Air Quality

Construction contractors would be required to comply with all applicable air-pollution-control rules, regulations, ordinances, and statutes that apply to the work being performed.

Noise

Construction contractors would be required to control and monitor their construction noise. Caltrans Standard Specifications require that construction noise not exceed 86 A-weighted decibels (dBA) maximum sound level (Lmax) at 50 feet from the job site from 9:00 p.m. to 6:00 a.m. (California Department of Transportation, 2022a).

Aesthetics

Concrete surface textures proposed for retaining walls and sound walls would be designed to match existing walls and be consistent with the *I-680-24 Interchange Architectural Visual Design Guidelines* (California Department of Transportation, 1989).

1.4.1.7 Transportation System Management, Transportation Demand Management, and Mass Transit Alternatives

Transportation Systems Management (TSM) strategies increase the efficiency of existing facilities by accommodating a greater number of vehicle trips without increasing the number of through lanes. Examples of TSM strategies include ramp metering, traffic operation systems, auxiliary lanes, turning lanes, reversible lanes, and traffic signal coordination. TSM also promotes automobile, public, and private transit; ridesharing programs; and bicycle and pedestrian improvements as elements of a unified urban transportation system. Modal alternatives integrate multiple transportation modes, such as pedestrian, bicycle, automobile, rail, and mass transit.

TSM strategies, such auxiliary lanes, are already in use within the Project Study Limits. In addition, separate ramp metering projects and a bus-on-shoulder project are currently in the Project Initiation Document Phase and Project Approval/Environmental Document (PA/ED) Phase within the Project Study Limits. The proposed express lane would encourage transit use and increase I-680's efficiency. Additional traffic operation systems for transportation management would be installed as part of this Project. Although TSM measures alone could not satisfy the purpose and need of the Project, the following TSM measures have been incorporated into the Build Alternatives for this Project: vehicle detection systems to monitor traffic speed, density, and enforcement; incident management; and other subsystems to maintain acceptable traffic flow in the express lane.

Transportation Demand Management (TDM) focuses on regional means of reducing the number of vehicle trips and vehicle miles traveled (VMT) as well as increasing vehicle occupancy. TDM facilitates higher vehicle occupancy or reduces traffic congestion by expanding the traveler's transportation options in terms of travel method, travel time, travel route, travel costs, and the quality and convenience of the travel experience. A typical TDM activity would be providing funds to regional agencies that are actively promoting ridesharing, maintaining rideshare databases, and providing limited rideshare services to employers and individuals. The proposed express lane would help to facilitate transit use and ridesharing. In addition, the vehicle detection systems for monitoring traffic speed and density to maintain an acceptable level of service (LOS) in the express lane would benefit transit and encourage HOV use on northbound I-680 between Livorna Avenue and SR-242. Additional mass transit improvements and TDM strategies are also being considered as CEQA mitigation for Alternatives 1C, 2, and 3, as described in Chapter 3, *CEQA Evaluation*.

1.4.1.8 Project Funding

The Project is not currently fully funded. Funding has currently been committed through Measure J, Surface Transportation Program, Local Partnership Program – Formula, and State Transportation Improvement Program. Additional funding is anticipated to come from Bay Area's Regional Measure 3, Local Partnership Program – Competitive, Senate Bill (SB) 1 Solutions for Congested Corridors Program, United States Department of Transportation (USDOT) Mega Grant Program, and other local funds. Depending on the availability of funds, the Project could be phased, with work north of the SR-24 Connector being completed first.

As described further in Section 3.2.17, *Transportation*, Alternatives 1C, 2, and 3 would require VMT mitigation for transportation impacts under CEQA. CCTA has been awarded funding from Transit Intercity Rail Capital Program Cycle 5 and from the Carbon Reduction Program, which would cover a portion of the capital costs for proposed VMT mitigation. Current grant programs that have the potential to fund future VMT mitigation include the following:

- Regional One Bay Area Grant Program
- Regional Transit-Oriented Communities & Climate Program Implementation Grants
- Transit Intercity Rail Capital Program
- State Transportation Improvement Program
- SB 1 Local Partnership Program
- SB 1 Solutions for Congested Corridor Program
- SB 1 Active Transportation Program
- California Energy Commission Fuel and Transportation Funding Programs
- USDOT Federal Funding Programs
- Bay Area Air Quality Management District's funding programs for public agencies

CCTA anticipates that it could receive additional funds from many of these sources to fund VMT mitigation but cannot feasibly estimate the total funds it would receive from these or other sources that may arise in the future.

1.4.2 Unique Features of Build Alternatives

1.4.2.1 Alternative 1C: Close the Gap with Realignment

Alternative 1C proposes to close the 7.5-mile gap between the two existing managed lane segments by adding a northbound express lane from Livorna Road to SR-242. Alternative 1C would also convert the existing northbound HOV lane from SR-242 to north of Arthur Road to an express lane (see Figure 1-3).

Alternative 1C includes the following proposed improvements:

- Add a northbound express lane from the Livorna Road on-ramp to south of the Olympic Boulevard on-ramp through widening and restriping.
- Add a northbound express lane from the Olympic Boulevard on-ramp to the Trinity Avenue Overcrossing as a barrier-separated express lane through widening and restriping.
- Add a northbound express lane from the Trinity Avenue Overcrossing to the Treat Boulevard off-ramp as a striped, buffer-separated express lane through widening and restriping.
- Realign southbound I-680 and the Southbound I-680/Westbound SR-24 Connector around three existing BART structure columns to make room for the northbound I-680 express lane.
    - **Realign Southbound I-680** – The existing southbound I-680 roadway pavement would be reconfigured to include northbound and southbound express lanes. Southbound I-680 would be realigned westward. The southbound Olympic Boulevard off-ramp would be realigned. The Southbound I-680/Westbound SR-24 Connector would be realigned and widened.
    - **Realign Southbound I-680/Westbound SR-24 Connector** – The existing roadway would be demolished to accommodate southbound I-680 realignment, and the Westbound SR-24 Connector would be realigned westward.
- Add a northbound express lane from the Treat Boulevard off-ramp to the SR-242 junction through widening and restriping.
- Convert the existing HOV lane from SR-242 to north of Arthur Road to an express lane.

The number of general-purpose lanes would be the same as existing conditions from Livorna Road to north of Arthur Road.

Alternative 1C was not selected as the preferred alternative for the Project.



Figure 1-3. Alternative 1C: Overview

State Route 24 Interchange

Alternative 1C would reconfigure northbound and southbound I-680 at the SR-24 Interchange. Alternative 1C includes adding a separated northbound express lane from the Olympic Boulevard on-ramp to the Trinity Avenue Overcrossing and a striped, buffer-separated northbound express lane from the Trinity Avenue Overcrossing to the Treat Boulevard off-ramp. Figure 1-4 provides a visual simulation of Alternative 1C at the BART crossing. Existing BART columns (i.e., P10, P11, and P12) would not be impacted by the Project. Drivers traveling on northbound I-680 who intend to exit on North Main Street, Treat Boulevard, or Ygnacio Valley Road would be required to leave the express lane prior to the Ygnacio Valley Road off-ramp.



Figure 1-4. Alternative 1C: Simulation of SR-24 Interchange Looking South

Auxiliary Lanes

Other than the restriping and pavement widening described below, Alternative 1C would not create or modify (i.e., lengthen or shorten) any existing auxiliary lanes.

Pavement Widening and Reconstruction

Alternative 1C would add a northbound express lane from Livorna Road to SR-242 and convert the existing northbound HOV lane from SR-242 to north of Arthur Road to an express lane. Table 1-2 provides the approximate pavement widening and reconstruction locations and descriptions for Alternative 1C.

Table 1-2. Alternative 1C: Pavement Widening and Reconstruction

Begin PM	End PM	Begin	End	Type of Work
R11.34	R12.91	North of Livorna Road Undercrossing	South of South Main Street Undercrossing	Outside widening along mainline (northbound)
R12.74	R12.91	Rudgear Road Northbound on-ramp		Ramp reconstruction
13.98	14.70	North of Olympic Boulevard Undercrossing	North of Oakvale Road Overcrossing	Mainline reconstruction (southbound)
13.92	14.19	Eastbound SR-24 to Southbound I-680 Connector		Outside widening along SR-24 Connector
14.02	14.09	Olympic Boulevard Southbound off-ramp		Ramp reconstruction
14.31	14.71	Southbound I-680 to Westbound SR-24 Connector		Connector reconstruction
14.68	14.79	North of Oakvale Road Overcrossing	South of Ygnacio Valley Road Undercrossing	Outside widening along mainline (northbound)
15.48	16.30	South or North Main Street Overcrossing	South of Treat Boulevard Overcrossing	Outside widening along mainline (northbound)
16.69	17.02	South of Oak Park Boulevard Overcrossing	North of Oak Park Boulevard Overcrossing	Outside widening along mainline (northbound)
R17.20	R17.45	South of Contra Costa Boulevard Overcrossing	North of Contra Costa Boulevard Overcrossing	Outside widening along mainline (northbound)
R17.79	R17.87	North of Monument Boulevard Overcrossing	Monument Boulevard on-ramp gore	Outside widening along mainline (northbound)
R18.17	R19.10	South of SR-242 junction	South of Willow Pass Road Undercrossing	Outside widening along mainline (northbound)
R18.57	R18.69	Northbound I-680 to Northbound SR-242 Connector		Outside widening along SR-242 Connector

Notes: PM = post mile; SR = State Route

Bridge Widening and Reconstruction

Alternative 1C would include new bridge structures for the Mount Diablo Boulevard Undercrossing and for the northbound Olympic Boulevard off-ramp. Alternative 1C would also require the existing Rudgear Road Undercrossing bridge to be widened. Table 1-3 provides additional information regarding the proposed bridge widening and reconstruction.

Table 1-3. Alternative 1C: Bridge Widening and Reconstruction

PM	Bridge Number	Bridge Name	Work Description	Location Description	Approx. Length (feet)	Approx. Area (square feet)
12.61	28-0059	Rudgear Road Undercrossing	Northbound I-680 Outside Widening	I-680/ Rudgear Road	575	10,159
14.14	28-0312K	Olympic Boulevard off-ramp	Separation Removal	Olympic Boulevard Southbound off-ramp	702	19,425
14.14	-	Eastbound SR-24 Connector Undercrossing	New Construction	Olympic Boulevard Southbound off-ramp	425	12,113
14.24	28-0128L	Mount Diablo Boulevard Undercrossing	New Construction	I-680/ Mount Diablo Boulevard	258	19,737
14.28	28-126G	Ygnacio Valley Road off-ramp	Column Modification (Bent 7)	Ygnacio Valley Road off-ramp	N/A	N/A

Notes: PM = post mile; SR = State Route

Concrete Barriers, Retaining Walls, and Sound Walls

Generally, the existing concrete median barrier would be retained between northbound and southbound I-680. However, some existing concrete barriers would be replaced where the northbound express lane physically separates from the general-purpose lanes (PM 13.98 to 14.16 and PM 14.60 to 14.73) and where the existing concrete barrier is non-standard (PM 16.44 to R18.69). A new concrete barrier would be placed between the northbound and southbound express lanes through the SR-24 Interchange (PM 14.16 to 14.60) and between existing southbound I-680 and proposed southbound I-680 (PM 14.14 to 14.52). In addition, existing retaining walls and sound walls may need to be replaced where highway widening is required. See Table 1-4 for specific locations. All new or replaced barriers, retaining walls, and sound walls would be constructed to current design standards.

Table 1-4. Alternative 1C: Retaining Walls and Sound Walls

Wall Number	Location	Begin PM	End PM	Retaining Wall Type	Sound Wall (Yes/No)	Length (feet)	Max Height (feet)	Excavation Depth (feet)	Cut(C)/ Fill(F)
LR-RW1	Livorna to Rudgear	R11.53	R12.42	Soil Nail	No	4698	15	5	C
LR-RW2	Rudgear Off-ramp Gore	R12.49	R12.60	Type 1	No	585	10	5	F
RSM-RW1	Rudgear On-ramp Gore	R12.74	R12.76	Type 1	No	149	16	5	F
RSM-RW2	Rudgear to South Main Street	R12.75	12.89	5SWBP	Yes	1473	22	5	F
24-RW1	SR-24 Interchange Southbound I-680 Right Shoulder	14.03	14.16	MSE	No	746	26	5	F
24-RW2	SR-24 Interchange Eastbound SR-24 Connector Right Shoulder	14.03	14.19	MSE	Yes	422	16	5	F
24-RW3	SR-24 Interchange Olympic Off-ramp Right Shoulder	14.05	14.11	MSE	Yes	56	22	5	F
24-RW4	SR-24 Interchange Olympic Off-ramp Left Shoulder	14.08	14.11	MSE	No	120	26	5	F
SW. No. 1	SR-24 Interchange Southbound I-680 Right Shoulder	14.16	14.20	Sound Wall	-	299	14	5	-
24-RW6	SR-24 Interchange Southbound I-680 Right Shoulder	14.16	14.23	MSE	No	487	30	8	F

Wall Number	Location	Begin PM	End PM	Retaining Wall Type	Sound Wall (Yes/No)	Length (feet)	Max Height (feet)	Excavation Depth (feet)	Cut(C)/ Fill(F)
24-RW7	SR-24 Interchange Southbound I-680 Right Shoulder	14.27	14.29	MSE	No	151	32	8	F
24-RW8	SR-24 Interchange Westbound SR-24 Connector Right Shoulder	14.32	14.58	Ground Anchor / Tangent Pile	No	1393	37	40	C
24-RW9	SR-24 Interchange Southbound I-680 Right Shoulder	14.33	14.69	Soldier Pile / Ground Anchor	No	1878	16	25	C
24-RW10	SR-24 Interchange Westbound SR-24 Connector Right Shoulder	14.58	14.70	Ground Anchor	No	567	33	40	C
M242-RW1	Monument to SR-242 Right Shoulder	R18.17	R18.22	Type 1 (Mod)	Yes	268	8	5	F
SW No. 3	Monument to SR-242 Right Shoulder	R18.22	R18.29	Sound Wall	-	185	14	5	-
M242-RW2	Monument to SR-242 Right Shoulder	R18.3	R18.49	Soil Nail	No	927	15	5	C
SW No. 4	Monument to SR-242 Right Shoulder	R18.55	R18.69	Sound Wall	-	789	14	5	-

Notes: MSE = mechanically stabilized earth; PM = post mile; SR = State Route

Northbound Truck Scale Facility

The existing northbound truck scale facility, south of the Treat Boulevard Overcrossing structure between northbound I-680 and the Treat Boulevard off-ramp, would remain in its current condition and location with minor off-ramp gore restriping.

Project Construction

Construction Duration

Alternative 1C construction is anticipated to take approximately 2 years to complete. Depending on funding availability, construction is anticipated to begin in 2025 and be completed by 2027 (approximately 24 months).

Construction Closures and Detours

Long-term full closure of I-680 is not anticipated. However, short-term nighttime closures of northbound I-680 would be required near the Westbound SR-24 Connector Ramp and the Northbound SR-242 Connector Ramp. Short-term nighttime lane closures would be needed along northbound I-680 for pavement overlay; striping; construction of sound walls, barriers, and retaining walls; and installation of temporary barriers along construction areas. Temporary daytime and/or nighttime closures of local streets, sidewalks, and bikeways would be needed to set up and remove falsework for bridge construction and widening, as described in more detail below. Additional lane closures or overnight closures could be required for new positive workzone protection.

Although temporary detours would be developed during the design phase and included in the TMP, potential temporary detours have been identified for the purposes of this Environmental Document.

- **Rudgear Road Undercrossing Bridge:** Widening and retrofitting the existing bridge would not require a lane closure on I-680. The two-lane, northbound I-680 on-ramp may be partially closed during construction. The existing shoulder would be reduced to provide room for construction activities. Falsework supports are anticipated to be set back from the channel walls to avoid impacting the San Ramon Creek structure. Falsework beams and a debris containment system would span over the channel, which would prevent debris from entering the channel during construction. A single lane of Rudgear Road would need to be closed for up to 2 months during the excavation, drilling, concrete placement, and backfill to retrofit footings on the south side of Rudgear Road. One of the proposed bridge bents would be located on the Iron Horse Regional Trail's paved portion, which would require a segment of the trail to be relocated. The trail would need to be detoured temporarily for falsework and to construct the bridge span over the trail.

- **Olympic Boulevard Off-ramp Bridge Separation:** Alternative 1C would include the demolition of the existing Olympic Boulevard Off-ramp Bridge and

construction of a new bridge structure, the Eastbound SR-24 Connector Undercrossing. It is anticipated that demolition of the old structure and construction of the new bridge would take approximately 14 months. The northbound I-680 Olympic Boulevard off-ramp would need to be closed for up to 11 months. Existing eastbound SR-24 lanes are planned to remain open during the daytime. Nighttime closures on eastbound SR-24 are expected during the existing bridge demolition, falsework erection and removal, restriping, and safety barrier placement.

- **Mount Diablo Boulevard Undercrossing Bridge:** Alternative 1C would include the construction of a new bridge structure to support southbound I-680 general-purpose lanes. The existing southbound I-680 lanes could then be utilized for both the northbound and southbound express lanes. It is anticipated that the new bridge would take approximately 16 months to construct. Lane closures on Mount Diablo Boulevard and Camino Diablo are anticipated to be needed to construct the columns for bents 2 and 3; approximately 1-2 months per bent. Nighttime lane closures are anticipated on Mount Diablo Boulevard and Camino Diablo for erecting and removing falsework. Bents 2 and 3 would each require lane closures for up to 5 nights, and spans 1, 2, and 3 would each require lane closures for up to 10 nights.

- **Ygnacio Valley Road Off-ramp Bridge Modification:** Alternative 1C would modify a column on the existing bridge to provide adequate site distance along southbound I-680. An overnight lane closure to set up barrier protection is anticipated on southbound I-680, and an overnight closure of the Ygnacio Valley off-ramp is anticipated to be necessary to remove the existing column.

Staging Areas

Staging areas would be determined during final design. Potential temporary staging areas that could be used during construction are shown in Appendix I, *Project Feature Figures and Impact Maps*. Construction materials, stockpiles, dumpsters, and vehicles and equipment, including but not limited to excavators, dozers, cranes, dump trucks, concrete trucks, concrete pumps, and pile drilling/driving equipment, could be stored temporarily at these staging areas during the construction period.

Water Quality

Alternative 1C is anticipated to result in an approximately 30.83-acre disturbed soil area (DSA) and a net new increase of 9.46 acres in impervious surface area. The DSA includes the proposed total construction area and any soil that would be exposed through pavement removal. As described in Section 1.4.1, *Common Design Features of the Build Alternatives*, an SWPPP would be prepared before Project construction. SWPPP requirements would be inspected and maintained during construction.

Right-of-Way

The proposed lane addition and supporting infrastructure are expected to be constructed primarily within existing State ROW. However, partial acquisitions, utility easements, and temporary construction easements (TCE) would be needed for tolling infrastructure, the widening of Rudgear Road Undercrossing Bridge, realignment of the Olympic Boulevard off-ramp, realignment of the Southbound I-680/Westbound SR-24 Connector, and for M242-RW1 construction and replanting. In sum, Alternative 1C would require narrow strips of ROW (also called slivers) from five publicly owned parcels and three privately owned parcel, which includes five partial fee acquisitions (approximately 0.08 acre), two permanent easements (approximately 0.65 acre), and five TCEs (approximately 0.44 acre). All permanent ROW acquisitions would be in Walnut Creek. No permanent or temporary displacement or relocation of any residence or business would be required. Refer to Table 2.1.1-3, in Section 2.1.1, *Existing and Future Land Use*, for proposed ROW locations.

Estimated Cost

The preliminary total cost estimate for Alternative 1C, including the support cost, is approximately $441 million, which includes approximately $226 million in capital cost. This cost estimate excludes any costs associated with VMT mitigation under CEQA, which is described further in Section 3.2.17, *Transportation*. The total cost of VMT mitigation for Alternative 1C is estimated to be approximately $208 million.

1.4.2.2 Alternative 2: Reduce the Gap Plus Braided Ramps (Preferred Alternative)

Alternative 2 includes many of the same improvements as Alternative 1C. However, Alternative 2 would leave a 2-mile gap in managed lanes on northbound I-680 at the SR-24 Interchange, specifically from north of the South Main Street off-ramp to just south of the North Main Street off-ramp. Alternative 2 also includes modifications to the on-ramp and off-ramp configurations between North Main Street and Treat Boulevard to address the existing major bottleneck and weaving issues in this area (see Figure 1-5).

Alternative 2 includes the following proposed improvements:

- Add a northbound express lane from the Livorna Road on-ramp to just north of the South Main Street off-ramp through widening and restriping. A 2-mile gap in the express lane would remain.
- Widen northbound I-680 between the Livorna Road on-ramp and the Rudgear Road on-ramp to accommodate the added express lane.
- Construct braided ramps between the North Main Street/Lawrence Way Interchange and the Treat Boulevard off-ramp (see Figure 1-6). Braided ramps are ramps that cross over each other and are separated vertically by concrete pillars that elevate one or more of the ramps.

- Add a northbound express lane from approximately 1,500 feet south of the North Main Street off-ramp to the SR-242 junction through widening and restriping.

- Widen northbound I-680 from south of the I-680/SR 242 interchange to the Willow Pass off-ramp and replace the median barrier to add a northbound express lane while maintaining a 50-mph stopping sight distance under the S242-S680 Connector Overcrossing.

- Convert the existing HOV lane from Willow Pass off-ramp to north of Arthur Road to an express lane.

The number of general-purpose lanes would be the same as existing conditions from Livorna Road to north of Arthur Road.

Alternative 2 has been selected as the preferred alternative for the Project.

State Route 24 Interchange

Alternative 2 would not reconfigure the existing SR-24 Interchange. Alternative 2 would include new signage and luminaires in the vicinity of the interchange to indicate that the express lane is ending before the interchange and beginning again after the interchange.

Auxiliary Lanes

Alternative 2 would include removing the Lawrence Way to Treat Boulevard auxiliary lane and constructing a braided ramp that would have the Lawrence Way on-ramp cross under the Treat Boulevard off-ramp. The braided ramp would shift northbound I-680 between Lawrence Way and Treat Boulevard slightly closer to existing BART tracks and facilities. Other than the restriping and pavement widening described below, Alternative 2 does not include modifying (i.e., lengthen or shorten) any other auxiliary lane.



Figure 1-5. Alternative 2: Overview



Figure 1-6. Proposed Braided Ramps

Pavement Widening and Reconstruction

Alternative 2 would add a northbound express lane from Livorna Road to south of the SR-24 Interchange and convert the existing northbound HOV lane to an express lane from SR-242 to north of Arthur Road. Alternative 2 would also include the construction of braided ramps for the Lawrence Way on-ramp. Table 1-5 provides the approximate pavement widening and reconstruction locations for Alternative 2.

Table 1-5. Alternative 2: Pavement Widening and Reconstruction

Begin PM	End PM	Begin	End	Type of Work
R11.34	R12.91	North of Livorna Road Undercrossing	South of South Main Street Undercrossing	Outside widening along mainline (northbound)
R12.74	R12.81	Rudgear Road Northbound on-ramp		Ramp reconstruction
15.46	16.24	South of North Main Street Overcrossing	South of Treat Road Overcrossing	Outside widening along mainline (northbound)
15.48	16.30	South or North Main Street Overcrossing	South of Treat Boulevard Overcrossing	Outside widening along mainline (northbound)
15.48	16.30	Treat Boulevard Northbound off-ramp		Ramp reconstruction
15.56	15.63	North Main Street Northbound off-ramp		Ramp reconstruction
15.61	15.71	Lawrence Way Northbound on-ramp		Ramp reconstruction
16.24	16.31	Truck Scales Northbound off-ramp		Ramp reconstruction
16.69	17.02	South of Oak Park Boulevard Overcrossing	North of Oak Park Boulevard Overcrossing	Outside widening along mainline (northbound)
R17.20	R17.45	South of Contra Costa Boulevard Overcrossing	North of Contra Costa Boulevard Overcrossing	Outside widening along mainline (northbound)
R17.79	R17.87	North of Monument Boulevard Overcrossing	Monument Boulevard on-ramp gore	Outside widening along mainline (northbound)

Begin PM	End PM	Begin	End	Type of Work
R18.17	R19.10	South of SR-242 Junction	South of Willow Pass Road Undercrossing	Outside widening along mainline (northbound)
R18.57	R18.69	Northbound I-680 to Northbound SR-242 Connector		Outside widening along SR-242 Connector

Notes: PM = post mile; SR = State Route

Bridge Widening and Reconstruction

Alternative 2 includes the construction of a new bridge structure for the Lawrence Way Northbound On-ramp Undercrossing and bridge widening for the existing Rudgear Road Undercrossing and the Contra Costa Canal Undercrossing.

Table 1-6 provides more information regarding the proposed new and modified bridge structures.

Table 1-6. Alternative 2: Bridge Widening and Reconstruction

PM	Bridge Number	Bridge Name	Work Description	Location Description	Approx. Length (feet)	Approx. Area (square feet)
12.1	28-0059	Rudgear Road Undercrossing	Northbound I-680 Outside Widening	I-680/ Rudgear Road	575	10,159
15.71	-	Lawrence Way Northbound On-ramp Undercrossing	New Construction	Treat Boulevard Northbound off-ramp/ Lawrence Way Northbound on-ramp	420	17,430
16.08	28-0135	Contra Costa Canal Undercrossing	Northbound Outside Widening	I-680/ Contra Costa Canal	133	4,367

Notes: PM = post mile; SR = State Route

Concrete Barriers, Retaining Walls, and Sound Walls

Generally, existing concrete median barriers between northbound and southbound I-680 would be retained. However, the existing median barrier would be reconstructed where it is non-standard (PM 16.44 to R18.69). Existing retaining walls and sound walls may need to be replaced where highway widening is required. See Table 1-7 for specific locations.

Table 1-7. Alternative 2: Retaining Walls and Sound Walls

Wall Number	Location	Begin PM	End PM	Retaining Wall Type	Sound Wall (Yes/No)	Length (feet)	Max Height (feet)	Excavation Depth (feet)	Cut(C)/ Fill(F)
LR-RW1	Livorna to Rudgear	R11.53	R12.42	Soil Nail	No	4698	15	5	C
LR-RW2	Rudgear Off-ramp Gore	R12.49	R12.60	Type 1	No	585	10	5	F
RSM-RW1	Rudgear On-ramp Gore	R12.74	R12.76	Type 1	No	149	16	5	F
RSM-RW2	Rudgear to South Main Street	R12.75	12.89	5SWVP	Yes	1473	22	5	F
NMT-RW1	North Main to Treat Left Shoulder	15.57	15.68	MSE	No	485	30	5	F
NMT-RW2	North Main to Treat Right Shoulder	15.65	15.68	MSE	No	98	30	5	F
NMT-RW3	North Main to Treat Left Shoulder	15.74	15.88	MSE	No	707	28	5	F
NMT-RW4	North Main to Treat Right Shoulder	15.74	16.08	MSE	No	1796	34	5	F
NMT-RW5	North Main to Treat Right Shoulder	16.10	16.18	MSE	No	436	18	5	F
M242-RW1	Monument to SR-242 Right Shoulder	R18.17	R18.22	Type 1 (Mod)	Yes	268	8	5	F
SW No. 3	Monument to SR-242 Right Shoulder	R18.22	R18.29	Sound Wall	-	185	14	5	-
M242-RW2	Monument to SR-242 Right Shoulder	R18.3	R18.49	Soil Nail	No	927	15	5	C
SW No. 4	Monument to SR-242 Right Shoulder	R18.55	R18.69	Sound Wall	-	789	14	5	-

Notes: MSE = mechanically stabilized earth; PM = post mile; SR = State Route

Northbound Truck Scale Facility

The existing northbound truck scale facility would remain in its current location with access provided directly from the mainline. Trucks would access the facility on a new dedicated truck scale off-ramp.

Project Construction

Construction Duration

Alternative 2 is anticipated to take approximately 2 years to construct. Depending on the availability of funding, construction is anticipated to begin in 2025 and be completed by 2027 (approximately 24 months).

Construction Closures and Detours

Long-term, full closure of I-680 is not anticipated. However, northbound I-680 would require short-term, nighttime closures near the Northbound SR-242 Connector Ramp. Short-term, nighttime lane closures would be needed along I-680 for pavement overlay; striping; construction of sound walls, barriers, and retaining walls; and installation of temporary barriers along construction areas. Temporary daytime and/or nighttime closures of local streets, sidewalks, and bikeways may be needed to set up and remove falsework for bridge construction and widening, as described in detail below. Additional lane closures or overnight closures could be required for new positive workzone protection.

Although temporary detours would be developed during the design phase and included in the TMP, potential temporary detours have been identified for the purposes of this Environmental Document.

- **Rudgear Road Undercrossing Bridge:** The construction activities for the Rudgear Road Undercrossing would be identical to that described for Alternative 1C (see Section 1.4.2.1, *Alternative 1C: Close the Gap with Realignment*).

- **Lawrence Way Northbound On-ramp Undercrossing Bridge:** This is a new structure for vehicles exiting at the Treat Boulevard off-ramp that spans the Lawrence Way on-ramp. The North Main Street off-ramp and Lawrence Way on-ramp would be reconstructed to accommodate the new bridge structure. The Lawrence Way on-ramp would remain open during construction, with a temporary ramp being provided during the existing Lawrence Way on-ramp's reconstruction. Overnight closures of the Lawrence Way on-ramp are anticipated during falsework erection and removal for spans 2 and 3. A long-term closure of the North Main Street off-ramp—up to 1 month—is anticipated to reconstruct the North Main Street off-ramp and match the proposed structure's grade.

- **Contra Costa Canal Undercrossing:** Widening and retrofitting the existing bridge would require shifting northbound I-680 lanes. Bridge widening construction would begin with the installation of a temporary barrier along the northbound I-680 outside shoulder to protect construction workers from freeway traffic. Once the temporary barrier is installed, access roads would be constructed at each abutment, which may require some tree removal and installation of temporary sheet pile shoring. It is anticipated that the Contra Costa Canal Trail would need to be closed and detoured for up to 1 month to widen the Contra Costa Canal Undercrossing. This segment of the Contra Costa Canal Trail is shared with the Briones to Mount Diablo Regional Trail. Falsework would be installed to support bridge widening and prevent any debris from falling onto the public and canal water passing under falsework during the remainder of the bridge widening.

Staging Areas

Staging areas would be identified during final design. Potential temporary staging areas that could be used during construction are shown in Appendix I, *Project Feature Figures and Impact Maps*. Unlike Alternative 1C, Alternative 2 would not include temporary staging areas at the Southbound I-680/ Eastbound SR-24 Connector. Construction materials, stockpiles, dumpsters, and vehicles and equipment, including but not limited to excavators, dozers, cranes, dump trucks, concrete trucks, concrete pumps, and pile drilling/driving equipment, could be stored temporarily at staging areas during the construction period.

Water Quality

Alternative 2 is anticipated to result in a DSA of approximately 24.41 acres and a net new increase of 7.69 acres of impervious surface areas. As described in Section 1.4.1, *Common Design Features of the Build Alternatives*, a SWPPP would be prepared before Project construction. SWPPP requirements would be inspected and maintained during construction.

Right-of-Way

The proposed lane addition and supporting infrastructure are expected to be constructed primarily within existing State ROW. However, partial acquisitions and TCEs would be needed to widen the Rudgear Road Undercrossing Bridge and reconfigure the Lawrence Way on-ramp and the Treat Boulevard off-ramp (i.e., braided ramps) and for M242-RW1 construction and replanting. In sum, Alternative 2 would require slivers from four publicly owned parcels, including three partial fee acquisitions (approximately 0.48 acre) and four TCEs (approximately 0.78 acre). No utility easement would be required. All permanent ROW acquisitions would be in Walnut Creek. No permanent or temporary displacement or relocation of any residence or business would be required. Refer to Table 2.1.1-3, in Section 2.1.1, *Existing and Future Land Use*, for more information regarding potential ROW.

Estimated Cost

The preliminary total cost estimate for Alternative 2, including the support cost, is approximately $312 million, which includes approximately $225 million in capital cost. This cost estimate excludes any costs associated with VMT mitigation under CEQA, which is described further in Section 3.2.17, *Transportation*. The total cost of VMT mitigation for Alternative 2 is estimated to be approximately $200 million.

1.4.2.3 Alternative 3: Close the Gap with Realignment Plus Braided Ramps

Alternative 3 represents the combined Project improvements proposed under Alternatives 1C and 2. Alternative 3 would close the 7.5-mile gap between the two existing managed lane segments on I-680 by constructing a northbound express lane from Livorna Road to SR-242 and by converting the existing northbound HOV lane from SR-242 to just north of Arthur Road to an express lane. This alternative would also include the traffic operational improvements proposed in Alternative 1C in the vicinity of the I-680/SR-24 Interchange, addressing the existing major bottleneck between North Main Street and Treat Boulevard. The existing weaving issues between these interchanges would be alleviated by modifying the on-ramp and off-ramp configuration. Alternative 3 would also construct braided ramps between the North Main Street/Lawrence Way Interchange and the Treat Boulevard off-ramp. The number of general-purpose lanes would be the same as existing conditions from Livorna Road to north of Arthur Road.

Alternative 3 was not selected as the preferred alternative for the Project.

State Route 24 Interchange

Alternative 3 would include the same changes at the SR-24 Interchange as Alternative 1C (see Section 1.4.2.1, *Alternative 1C: Close the Gap with Realignment*).

Auxiliary Lanes

Alternative 3 would include the same auxiliary lane changes as Alternative 2, which includes removing the Lawrence Way to Treat Boulevard auxiliary lane and constructing braided ramps for the Treat Boulevard off-ramp and Lawrence Way on-ramp (see Section 1.4.2.2, *Alternative 2: Reduce the Gap Plus Braided Ramps*). Other than lane restriping, none of the other auxiliary lanes would be modified.

Pavement Widening and Reconstruction

Alternative 3 would add a northbound express lane from Livorna Road to SR-242 and convert the existing northbound HOV lane from SR-242 to north of Arthur Road to an express lane. Alternative 3 would also include the construction of braided ramps for the Lawrence Way on-ramp. Table 1-8 provides the approximate pavement widening and reconstruction locations for Alternative 3.



Figure 1-7. Alternative 3: Overview

Table 1-8. Alternative 3: Pavement Widening and Reconstruction

Begin PM	End PM	Begin	End	Type of Work
R11.34	R12.91	North of Livorna Road Undercrossing	South of South Main Street Undercrossing	Outside widening along mainline (northbound)
R12.74	R12.91	Rudgear Road Northbound on-ramp		Ramp reconstruction
13.98	14.70	North of Olympic Boulevard Undercrossing	North of Oakvale Road Overcrossing	Reconstruction of mainline (southbound)
13.92	14.19	Eastbound SR-24 to Southbound I-680 Connector		Outside widening along SR-24 Connector
14.02	14.09	Olympic Boulevard Southbound off-ramp		Ramp reconstruction
14.31	14.71	Southbound I-680 to Westbound SR-24 Connector		Connector reconstruction
14.68	14.79	North of Oakvale Road Overcrossing	South of Ygnacio Valley Road Undercrossing	Outside widening along mainline (northbound)
15.48	16.30	South or North Main Street Overcrossing	South of Treat Boulevard Overcrossing	Outside widening along mainline (northbound)
15.54	16.22	Treat Boulevard Northbound off-ramp		Ramp reconstruction
15.56	15.63	North Main Street Northbound off-ramp		Ramp reconstruction
15.61	15.71	Lawrence Way Northbound on-ramp		Ramp reconstruction
16.24	16.31	Truck Scales Northbound off-ramp		Ramp reconstruction
16.69	17.02	South of Oak Park Boulevard Overcrossing	North of Oak Park Boulevard Overcrossing	Outside widening along mainline (northbound)
R17.20	R17.45	South of Contra Costa Boulevard Overcrossing	North of Contra Costa Boulevard Overcrossing	Outside widening along mainline (northbound)

Begin PM	End PM	Begin	End	Type of Work
R17.79	R17.87	North of Monument Boulevard Overcrossing	Monument Boulevard on-ramp gore	Outside widening along mainline (northbound)
R18.17	R19.10	South of SR-242 Junction	South of Willow Pass Road Undercrossing	Outside widening along mainline (northbound)
R18.57	R18.69	Northbound I-680 to northbound SR-242 Connector		Outside widening along SR-242 Connector

Notes: PM = post mile; SR = State Route

Bridge Widening and Reconstruction

Like Alternative 1C, Alternative 3 would include two new bridge structures for the Mount Diablo Boulevard Undercrossing and the Eastbound SR-24 Connector Undercrossing and bridge widening for the existing Rudgear Road Undercrossing. Similar to Alternative 2, Alternative 3 would include construction of a new bridge structure for the Lawrence Way Northbound On-ramp Undercrossing and bridge widening for the Contra Costa Canal Undercrossing. Table 1-9 provides more information regarding the proposed new and modified bridge structures.

Table 1-9. Alternative 3: Bridge Widening and Reconstruction

PM	Bridge Number	Bridge Name	Work Description	Location Description	Approx. Length (feet)	Approx. Area (square feet)
12.61	28-0059	Rudgear Road Undercrossing	Northbound I-680 Outside Widening	I-680/ Rudgear Road	575	10,159
14.14	28-0312K	Olympic Boulevard off-ramp	Separation Removal	Olympic Boulevard Southbound off-ramp	702	19,425
14.14	-	Eastbound SR-24 Connector Undercrossing	New Construction	Olympic Boulevard Southbound off-ramp	425	12,113
14.24	28-0128L	Mount Diablo Boulevard Undercrossing	New Construction	I-680/ Mount Diablo Boulevard	258	19,737

PM	Bridge Number	Bridge Name	Work Description	Location Description	Approx. Length (feet)	Approx. Area (square feet)
14.28	28-126-G	Ygnacio Valley Road off-ramp	Column Modification (Bent 7)	Ygnacio Valley Road off-ramp	N/A	N/A
15.71	-	Lawrence Way Northbound On-ramp Undercrossing	New Construction	Treat Boulevard Northbound off-ramp/ Lawrence Way Northbound on-ramp	420	17,430
16.08	28-0135	Contra Costa Canal Undercrossing	Northbound Outside Widening	I-680/ Contra Costa Canal	133	4,367

Notes: PM = post mile; SR = State Route

Concrete Barriers, Retaining Walls, and Sound Walls

Generally, the existing concrete median barrier between northbound and southbound I-680 would be retained. However, existing concrete barriers would be replaced where the northbound express lane physically separates from the general-purpose lanes (PM13.98 to 14.16 and PM 14.60 to 14.73) and where the existing concrete barrier is non-standard (PM 16.44 to R18.69). Additionally, a new concrete barrier would be placed between the northbound and southbound express lanes through the SR-24 Interchange (PM 14.16 to 14.60) and between existing southbound I-680 and proposed southbound I-680 (PM 14.14 to 14.52). In addition, existing retaining walls and sound walls may need to be replaced where highway widening is required. See Table 1-10 (below) for specific locations.

Northbound Truck Scale Facility

As with Alternative 2, the existing northbound truck scale facility would remain in its current location with access provided directly from the mainline. Trucks would access the facility on a new dedicated truck scale off-ramp.

Project Construction

Construction Duration

Alternative 3 is anticipated to take approximately 2 years to construct. Depending on the availability of funding, construction is anticipated to begin in 2025 and be completed by 2027 (approximately 24 months).

Construction Closures and Detours

Long-term, full closure of I-680 is not anticipated. However, short-term, nighttime closures of northbound I-680 would be required near the Westbound SR-24 Connector Ramp and the Northbound SR-242 Connector Ramp. Short-term nighttime lane closures would be needed along northbound I-680 for pavement overlay; striping; construction of sound walls, barriers, and retaining walls; and installation of temporary barriers along construction areas. Temporary daytime and/or nighttime closures of local streets, sidewalks, and bikeways would be needed to set up and remove falsework for bridge construction and widening. Although temporary detours would be developed during the design phase and included in the TMP, potential temporary detours have been identified for the purposes of this Environmental Document. Additional lane closures or overnight closures could be required for new positive workzone protection. Alternative 3 is anticipated to include the same closures and detours as Alternatives 1C and 2 combined.

Staging Areas

Staging areas would be identified during final design. It is assumed that Alternative 3 would use the same temporary staging areas as those described for Alternative 1C. Construction materials, stockpiles, dumpsters, and construction vehicles and equipment, including excavators, dozers, cranes, dump trucks, concrete trucks, concrete pumps, and pile drilling/driving equipment, as well as construction vehicles, could be stored temporarily at staging areas.

Water Quality

Alternative 3 is anticipated to result in a DSA of approximately 37.24 acres and a net new increase of 11.69 acres of impervious surface areas. As described in Section 1.4.1, *Common Design Features of the Build Alternatives*, a SWPPP would be prepared before Project construction. SWPPP requirements would be inspected and maintained during construction.

Right-of-Way

Most of the proposed lane addition and supporting infrastructure are expected to be constructed primarily within existing State ROW. In sum, Alternative 3 would require slivers from seven publicly owned parcels and three privately owned parcel, which includes seven partial fee acquisitions (approximately 0.54 acre), two permanent easements (approximately 0.65 acre), and seven TCEs (approximately 0.82 acre). All permanent ROW acquisition would be in Walnut Creek. No permanent or temporary displacement or relocation of any residence or business would be required. Refer to Table 2.1.1-3 in Section 2.1.1, *Existing and Future Land Use*, for more information regarding potential ROW.

Table 1-10. Alternative 3: Retaining Walls and Sound Walls

Wall Number	Location	Begin PM	End PM	Retaining Wall Type	Sound Wall (Yes/No)	Length (feet)	Max Height (feet)	Excavation Depth (feet)	Cut(C)/ Fill(F)
LR-RW1	Livorna to Rudgear	R11.53	R12.42	Soil Nail	No	4698	15	5	C
LR-RW2	Rudgear Off-ramp Gore	R12.49	R12.60	Type 1	No	585	10	5	F
RSM-RW1	Rudgear On-ramp Gore	R12.74	R12.76	Type 1	No	149	16	5	F
RSM-RW2	Rudgear to South Main Street	R12.75	12.89	5SWVP	Yes	1473	22	5	F
24-RW1	SR-24 Interchange Southbound I-680 Right Shoulder	14.03	14.16	MSE	No	746	26	5	F
24-RW2	SR-24 Interchange Eastbound SR-24 Connector Right Shoulder	14.03	14.19	MSE	Yes	422	16	5	F
24-RW3	SR-24 Interchange Olympic Off-ramp Right Shoulder	14.05	14.11	MSE	Yes	56	22	5	F
24-RW4	SR-24 Interchange Olympic Off-ramp Left Shoulder	14.08	14.11	MSE	No	120	26	5	F
SW. No. 1	SR-24 Interchange Southbound I-680 Right Shoulder	14.16	14.20	Sound Wall	-	299	14	5	-
24-RW6	SR-24 Interchange Southbound I-680 Right Shoulder	14.16	14.23	MSE	No	487	30	8	F
24-RW7	SR-24 Interchange Southbound I-680 Right Shoulder	14.27	14.29	MSE	No	151	32	8	F
24-RW8	SR-24 Interchange Westbound SR-24 Connector Right Shoulder	14.32	14.58	Ground Anchor / Tangent Pile	No	1393	37	40	C

Wall Number	Location	Begin PM	End PM	Retaining Wall Type	Sound Wall (Yes/No)	Length (feet)	Max Height (feet)	Excavation Depth (feet)	Cut(C)/ Fill(F)
24-RW9	SR-24 Interchange Southbound I-680 Right Shoulder	14.33	14.69	Soldier Pile / Ground Anchor	No	1878	16	25	C
24-RW10	SR-24 Interchange Westbound SR-24 Connector Right Shoulder	14.58	14.70	Ground Anchor	No	567	33	40	C
NMT-RW1	North Main to Treat Left Shoulder	15.57	15.68	MSE	No	485	30	5	F
NMT-RW2	North Main to Treat Right Shoulder	15.65	15.68	MSE	No	98	30	5	F
NMT-RW3	North Main to Treat Left Shoulder	15.74	15.88	MSE	No	707	28	5	F
NMT-RW4	North Main to Treat Right Shoulder	15.74	16.08	MSE	No	1796	34	5	F
NMT-RW5	North Main to Treat Right Shoulder	16.10	16.18	MSE	No	436	18	5	F
M242-RW1	Monument to SR-242 Right Shoulder	R18.17	R18.22	Type 1 (Mod)	Yes	268	8	5	F
SW No. 3	Monument to SR-242 Right Shoulder	R18.22	R18.29	Sound Wall	-	185	14	5	-
M242-RW2	Monument to SR-242 Right Shoulder	R18.3	R18.49	Soil Nail	No	927	15	5	C
SW No. 4	Monument to SR-242 Right Shoulder	R18.55	R18.69	Sound Wall	-	789	14	5	-

Notes: MSE = mechanically stabilized earth; PM = post mile; SR = State Route

Estimated Cost

The preliminary total cost estimate for Alternative 3, including the support cost, is approximately $498 million, which includes approximately $282 million in capital cost. This cost estimate excludes any costs associated with VMT mitigation under CEQA, which is described further in Section 3.2.17, *Transportation*. The total cost of VMT mitigation for Alternative 3 is estimated to be approximately $210 million.

1.4.2.4 Alternative 5: Reduce the Gap with General-Purpose Lane Conversion Plus Braided Ramps

Alternative 5 is similar to Alternative 2. Alternative 5 would leave a 2-mile gap in the northbound I-680 managed lane in the vicinity of the I-680/SR-24 Interchange. The primary difference between Alternative 2 and Alternative 5 is that Alternative 5 would not add any new lanes on northbound I-680. Instead, an express lane would be constructed by converting existing general-purpose and HOV lanes (see Figure 1-8).

Project improvements under Alternative 5 would include the following:

- Add a northbound express lane from the Livorna Road on-ramp to north of the South Main Street off-ramp by converting an existing general-purpose lane to an express lane.[1]
- Construct braided ramps between the North Main Street/Lawrence Way Interchange and the Treat Boulevard off-ramp.
- Convert an existing general-purpose lane to an express lane from just south of the North Main Street off-ramp to the SR-242 junction.[1] Pavement widening and restriping at SR-242 junction.
- Convert the existing HOV lane to an express lane between SR-242 to north of Arthur Road.

The number of general-purpose lanes would be one less than existing conditions from the Livorna Road on-ramp to SR-242 junction.

Alternative 5 was not selected as the preferred alternative for the Project.

State Route 24 Interchange

Like Alternative 2, Alternative 5 would not reconfigure the SR-24 Interchange. Alternative 5 would add lighting and signage to indicate the end and beginning of express lanes at this interchange.

[1] The existing inside general-purpose lane would be converted to an HOV lane and then concurrently converted to an express lane.



Figure 1-8. Alternative 5: Overview

Auxiliary Lanes

Like Alternatives 2 and 3, Alternative 5 would remove the Lawrence Way to Treat Boulevard auxiliary lane and construct braided ramps for the Treat Boulevard off-ramp and Lawrence Way on-ramp. Other than lane restriping, none of the other auxiliary lanes would be modified.

Pavement Widening and Reconstruction

Alternative 5 would have less pavement widening and reconstruction than Alternatives 1C, 2, or 3.

Table 1-11 provides the approximate pavement widening and reconstruction locations for Alternative 5.

Table 1-11. Alternative 5: Pavement Widening and Reconstruction

Begin PM	End PM	Begin	End	Type of Work
15.46	16.24	South of North Main Street Overcrossing	South of Treat Road Overcrossing	Outside widening along mainline (northbound)
15.48	16.11	South of North Main Street Overcrossing	South of Treat Boulevard Overcrossing	Outside widening along mainline (northbound)
15.54	16.22	Treat Boulevard Northbound off-ramp		Ramp reconstruction
15.56	15.63	North Main Street Northbound off-ramp		Ramp reconstruction
15.61	15.71	Lawrence Way Northbound on-ramp		Ramp reconstruction
16.24	16.31	Truck Scales Northbound off-ramp		Ramp reconstruction
R18.81	R19.07	North of SR-242 Interchange		Outside widening along mainline (northbound)

Notes: PM = post mile; SR = State Route

Bridge Widening and Reconstruction

Alternative 5 includes the construction of a new bridge structure for the Treat Boulevard Overcrossing and bridge widening for the Contra Costa Canal Undercrossing Bridge.

Unlike Alternatives 1C, 2, and 3, Alternative 5 would not widen the Rudgear Road Undercrossing Bridge.

Table 1-12 provides more information regarding the proposed new and modified bridge structures for Alternative 5.

Table 1-12. Alternative 5: Bridge Widening and Reconstruction

PM	Bridge Number	Bridge Name	Work Description	Location Description	Approx. Length (feet)	Approx. Area (square feet)
15.71	-	Lawrence Way Northbound On-ramp Undercrossing	New construction	Treat Boulevard Northbound off-ramp/ Lawrence Way Northbound on-ramp	420	17,430
16.08	28-0135	Contra Costa Canal Undercrossing	Northbound outside widening	I-680/ Contra Costa Canal	133	4,367

Concrete Barriers, Retaining Walls, and Sound Walls

Generally, existing concrete median barriers between northbound and southbound I-680 would be retained. However, the existing median barrier would be reconstructed where it is non-standard between PM 16.44 and R18.55. Existing retaining walls and sound walls may need to be replaced where highway widening is required. See Table 1-13 for specific locations.

Northbound Truck Scale Facility

As with Alternative 2, the existing northbound truck scale facility would remain in its current location with access provided directly from the mainline. Trucks would access the facility on a new dedicated truck scale off-ramp.

Project Construction

Construction Duration

Alternative 5 is anticipated to take approximately 2 years to construct. Depending on the availability of funding, construction is anticipated to begin in 2025 and be completed by 2027 (approximately 24 months).

Table 1-13. Alternative 5: Retaining Walls and Sound Walls

Wall Number	Location	Begin PM	End PM	Retaining Wall Type	Sound Wall (Yes/No)	Length (feet)	Max Height (feet)	Excavation Depth (feet)	Cut(C)/ Fill(F)
NMT-RW1	North Main to Treat Left Shoulder	15.57	15.68	MSE	No	485	30	5	F
NMT-RW2	North Main to Treat Right Shoulder	15.65	15.68	MSE	No	98	30	5	F
NMT-RW3	North Main to Treat Left Shoulder	15.74	15.88	MSE	No	707	28	5	F
NMT-RW4	North Main to Treat Right Shoulder	15.74	16.08	MSE	No	1796	34	5	F
NMT-RW5	North Main to Treat Right Shoulder	16.10	16.18	MSE	No	436	18	5	F

Notes: MSE = mechanically stabilized earth

Construction Closures and Detours

Full closure of I-680 is not anticipated. However, temporary nighttime lane closures would be needed along I-680 for pavement overlay, striping, construction of barriers and retaining walls, and installation of temporary barriers along construction areas. Temporary daytime and/or nighttime closures of local streets, sidewalks, and bikeways may be needed to set up and remove falsework for bridge construction and widening. Although temporary detours would be developed during the design phase and included in the TMP, potential temporary detours have been identified for the purposes of this Environmental Document. Additional lane closures or overnight closures could be required for new positive workzone protection. It is anticipated that Alternative 5 would include the same closures and detours as Alternative 2 between North Main Street and Treat Boulevard.

Staging Areas

Staging areas would be identified during final design. It is assumed that Alternative 5 would have two staging areas—one at the SR-4 Interchange and one at the North Main Street off-ramp. Both staging areas would be within State ROW. Construction materials, stockpiles, dumpsters, equipment, and vehicles, including but not limited to excavators, dozers, cranes, dump trucks, concrete trucks, concrete pumps, and pile drilling/driving equipment, could be stored temporarily at staging areas during the construction period.

Water Quality

Alternative 5 is anticipated to result in a DSA of approximately 10.65 acres and a net new increase of 2.93 acres impervious surface areas. As described in Section 1.4.1, *Common Design Features of the Build Alternatives*, an SWPPP would be prepared before Project construction. SWPPP requirements would be inspected and maintained during construction.

Right-of-Way

Alternative 5 does not propose any lane additions. However, partial acquisitions and TCEs would be needed for the reconfiguration of the Lawrence Way on-ramp and the Treat Boulevard off-ramp (i.e., braided ramps). In sum, Alternative 5 would require slivers from two publicly owned parcels, including two partial fee acquisitions (approximately 0.46 acre) and two TCEs (approximately 0.38 acre). All permanent ROW acquisitions would be in Walnut Creek. No permanent or temporary displacement or relocation of any residence or business would be required. Refer to Table 2.1.1-3 in Section 2.1.1, *Existing and Future Land Use*, for more information regarding potential ROW.

Estimated Cost

The preliminary total cost estimate for Alternative 5, including the support cost, is approximately $91 million. This alternative would not require VMT mitigation.

1.4.3 No-Build Alternative

Under the No-Build Alternative, northbound I-680 would remain in its current configuration and no improvements would be implemented. The gap in the northbound managed lane would remain and, as traffic demand increases, traffic operations along northbound I-680 would further deteriorate, resulting in increased congestion, vehicle delay, vehicle operating costs, and vehicle emissions due to slower operating speeds on northbound I-680 (see Figure 1-9).

The No-Build Alternative would avoid construction costs (no capital expenditure). It would avoid impacts from construction activities on environmental resources that are anticipated under the Build Alternatives related to widening the highway, and it would avoid temporary impacts. However, the substantial existing traffic backups would worsen over time, leading to longer vehicle delays and travel times. The No Build Alternative would not address or alleviate the existing and forecasted operational issues on northbound I680 and would not satisfy the Project purpose and need. The No-Build Alternative represents the baseline condition against which the Build Alternatives would be compared for NEPA.

1.4.4 Comparison of Alternatives

Table S-1 in the Summary provides a comparison between the effects of the Build Alternatives and the No-Build Alternative. The complete evaluation of alternatives under NEPA is provided in Chapter 2, and the complete evaluation of alternatives under CEQA is provided in Chapter 3. In addition to their environmental impacts, alternatives are being compared and evaluated based on their ability to meet the Project's purpose and need.

Alternative 1C would add an express lane on northbound I-680 from Livorna Road to SR-242, realign southbound I-680 through the SR-24 Interchange, and convert the existing HOV lane to an express lane from SR-242 to north of the Arthur Road on-ramp. This alternative would close the gap in managed lanes on northbound I-680. Alternative 1C would not change the number of general-purpose lanes from Livorna Road to south of the Benicia-Martinez Bridge Toll Plaza.

Alternative 2 would add an express lane on northbound I-680 from Livorna Road to SR-242 with a two-mile gap through the SR-24 Interchange, construct braided ramps between the Lawrence Way on-ramp and Treat Boulevard off-ramp, and convert the existing HOV lane to an express lane from SR-242 to the Arthur Road on-ramp. As such, this alternative would reduce but would not close the gap in managed lanes on northbound I-680. Alternative 2 would not change the number of general-purpose lanes from Livorna Road to south of the Benicia-Martinez Bridge Toll Plaza.

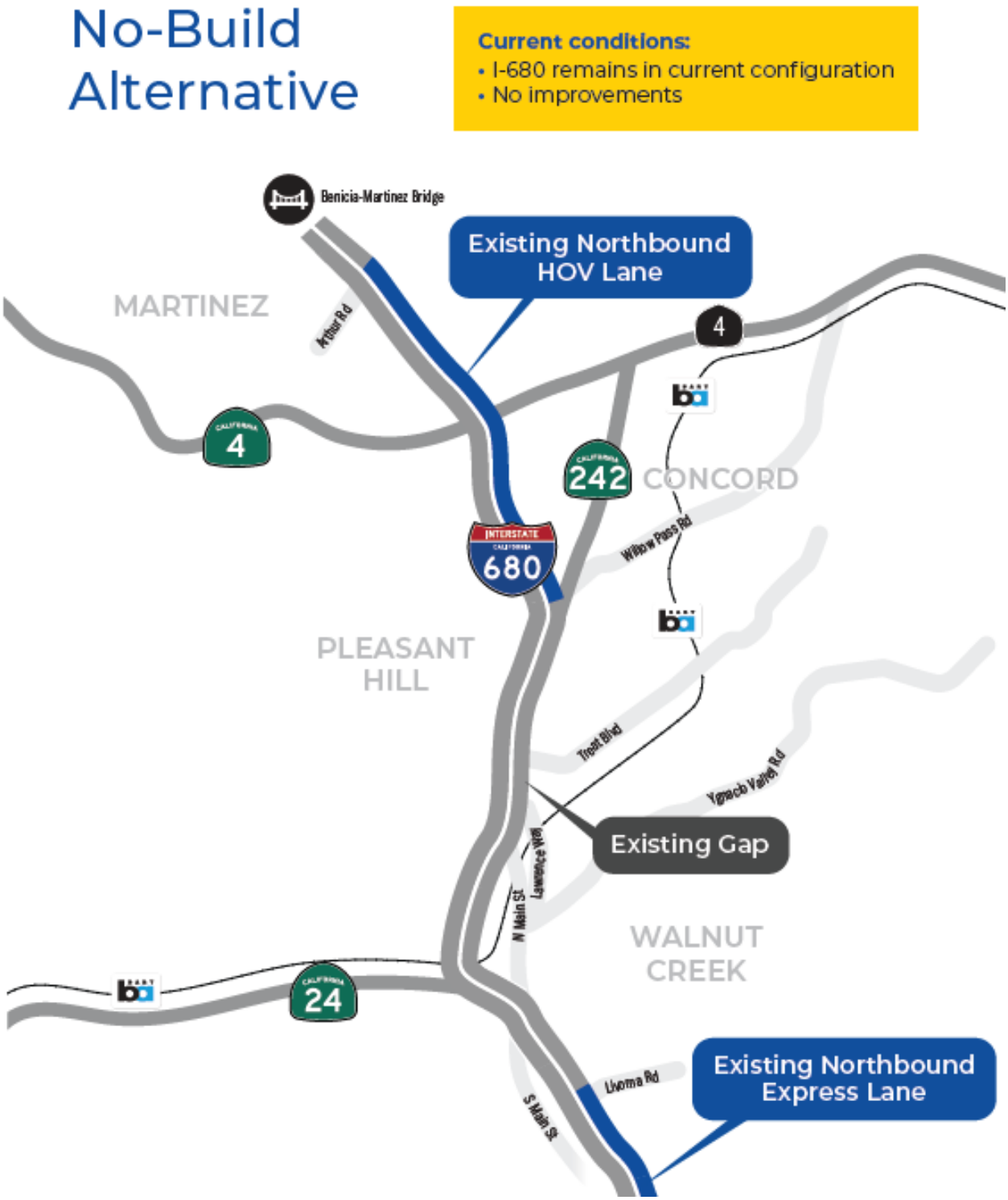


Figure 1-9. No-Build Alternative

Alternative 3 is a combination of Alternatives 1C and 2. Alternative 3 would add an express lane on northbound I-680 from Livorna Road to SR-242, realign southbound I-680 through the SR-24 Interchange, construct braided ramps between the Lawrence Way on-ramp and Treat Boulevard off-ramp, and convert the existing HOV lane to an express lane from SR-242 to the Arthur Road on-ramp. This alternative would close the gap in managed lanes on northbound I-680. Alternative 3 would not change the number of general-purpose lanes from Livorna Road to south of the Benicia-Martinez Bridge Toll Plaza.

Alternative 5 would convert the inside general-purpose lane (i.e., the lane along the median) to an express lane from south of North Main Street to SR-242, construct braided ramps between the Lawrence Way on-ramp and Treat Boulevard off-ramp, and convert the existing HOV lane to an express lane from SR-242 to the Arthur Road on-ramp. Similar to Alternative 2, Alternative 5 would reduce but would not close the gap in managed lanes on northbound I-680. Unlike Alternative 2, Alternative 5 would not add any existing through lanes on I-680. Alternative 5 would result in one less general-purpose lane from Livorna Road to the SR-242 junction. This alternative was developed to avoid increasing VMT.

As described further in the *Traffic Operations Analysis Report* (TOAR) (DKS Associates, 2023), prepared for the proposed Project, while none of the Build Alternatives would fully eliminate bottlenecks and associated queuing along northbound I-680, Alternatives 1C, 2, and 3 would substantially lessen the afternoon peak period bottlenecks that would develop under the No-Build alternative north of SR-24 due to increased mainline capacity. Alternative 5 reduces mainline capacity when compared to the No-Build alternative, but the braided ramps and the conversion to express lane generally offset the capacity reduction and result in improved mainline operations during the afternoon peak period. All Build Alternatives would reduce delay and improve travel times compared to the No-Build Alternative during the afternoon peak period. While the express lane benefits traffic operations along I-680, under Alternatives 1C and 3, the queues approaching the bottlenecks north of SR-24 extend onto eastbound SR-24, thereby deteriorating the operations on eastbound SR-24. Under Alternative 2, vehicles traveling on eastbound SR-24 would access the proposed northbound I-680 express lane at its starting point or have a direct merge to the start of the proposed northbound I-680 express lane, resulting in improved operations on eastbound SR-24.

The traffic operations analysis results indicate that the combination of the extended but non-continuous express lane and the braided ramp improvements in Alternative 2 provides similar benefits on I-680 as those with the continuous express lane (Alternatives 1C and 3), while also improving the operations on SR-24. Based on the analysis presented in the TOAR, Alternative 2 provides the best overall operational benefits of the Build Alternatives.

All Build Alternatives would have a two-year construction schedule. Alternatives 1C, 2, and 3 would have similar costs, with Alternative 3 being the costliest of all Build Alternatives. Alternative 3 would also have the largest DSA and require more ROW, more pavement widening, and more bridge widening/reconstruction than any of the

other Build Alternatives. Since Alternative 5 would not add a new through lane on I-680, Alternative 5 would have a much lower cost and smaller DSA than the other Build Alternatives. Alternative 5 would also not require VMT mitigation, as described further in Chapter 3, *CEQA Evaluation*.

1.4.5 Alternatives Selection Process

After the public circulation period of the Draft EIR/EA, all comments were considered and Caltrans selected a preferred alternative and made the final determination of the Project's effect on the environment. Caltrans has prepared findings for all significant impacts identified, prepared a Statement of Overriding Considerations for impacts that will not be mitigated below a level of significance, and plans to certify that the findings and Statement of Overriding Considerations have been considered prior to Project approval. With this Final Environmental Document (FED), Caltrans certifies that the Project complies with CEQA and will file a Notice of Determination with the State Clearinghouse following Project approval. The Project will have significant impacts, and mitigation measures were included as conditions of Project approval. Findings were made and a Statement of Overriding Considerations was adopted. Similarly, Caltrans, as assigned by the FHWA, has determined the NEPA action does not significantly impact the environment. Caltrans will issue a Finding of No Significant Impact prior to Project approval.

1.4.5.1 Identification of a Preferred Alternative

The Project Development Team (PDT) identified Alternative 2 as the preferred alternative on September 10, 2024. This decision was made after a series of PDT meetings were conducted following the Draft EIR/EA public comment period in July and August 2024. The meetings included a summary of each alternative's environmental impacts; maintenance, safety, and design criteria; and traffic benefits and performance as well as the comment letters received on the Draft EIR/EA during the public comment period.

After comparing and weighing the benefits and impacts of all feasible alternatives, the PDT identified Alternative 2 as the preferred alternative because it would provide the most operational benefits on I-680 and would not deteriorate traffic operations on SR-24.

The Project would result in the following traffic operational benefits compared to the No-Build Alternative for the Design Year (2047), which is described in more detail in Section 2.1.8, *Traffic and Transportation/Pedestrian and Bicycle Facilities*:

- Improve freeway segment speeds on northbound I-680 in the afternoon peak period.
- Substantially improve travel time in general purpose and managed lanes on northbound I-680.

- Improve vehicle hours of delay (VHD) on northbound I-680.
- Improve freeway segment LOS on northbound I-680.
- Improve VHD in the morning peak period on SR-24.

Among the four Build Alternatives evaluated, Alternative 2 provides the most overall operational benefits and best meets the Project's purpose and need. Alternative 2 is a feasible and prudent alternative that would reduce peak-period congestion and delay on northbound I-680, encourage use of HOV and transit services, offer non-carpool eligible drivers a reliable travel time option, optimize use of the existing HOV lane capacity in the I-680 corridor to better meet current and future traffic demands, and reduce travel time and improve travel time reliability for travelers in the corridor.

Additional reasons why Alternative 2 was selected as the preferred alternative include the following:

- Unlike all other Build Alternatives evaluated, Alternative 2 would substantially improve freeway segment speeds, travel time, VHD, and vehicle and person throughput on I-680 during the afternoon peak period in the Design Year.
- Unlike all other Build Alternatives evaluated, Alternative 2 would not deteriorate and would substantially improve VHD on SR-24 during the afternoon peak period in the Design Year.
- Alternative 2 would improve freeway segment speeds, travel time, and VHD on I-680 during the morning peak period in the Design Year. Alternative 5 would deteriorate all of these metrics.
- Alternative 2 would require less ROW than Alternatives 1C and 3. Unlike Alternatives 1C and 3, Alternative 2 would not require permanent or temporary ROW from private property.
- Alternative 2 would require fewer design exceptions than Alternatives 1C and 3, indicating increased likelihood for constructability.
- Unlike Alternatives 1C and 3, Alternative 2 would not include an 11-month closure of Olympic Boulevard and would have fewer overnight closures than Alternatives 1C and 3.
- Unlike Alternatives 1C and 3, Alternative 2 would not require the replacement of existing soundwalls and construction of new soundwalls at the SR-24 Interchange (i.e., Noise Barrier System 5/24-RW2/SW No.1/24-RW4).
- Unlike Alternative 3, Alternative 2 would not result in a deficit of post-construction treatment areas.

- The capital and mitigation costs for Alternative 2 would be less than Alternatives 1C and 3.
- Alternative 2 would result in fewer VMT and require less mitigation than Alternatives 1C and 3.
- Of the 81 comments received on the Draft EIR/EA, 32 opposed the conversion of a general-purpose lane without adding capacity (i.e., Alternative 5).

Alternative 5 was not selected as the preferred alternative due to the number of comments received from the public and elected officials opposing the conversion of a general-purpose lane to an express lane during the Draft EIR/EA public comment period as well as the projected increase in VHD on I-680 in the morning peak period compared to the No-Build Alternative, the projected deterioration of traffic on SR-24 compared to the No-Build Alternative, and other concerns raised regarding traffic impacts and constructability.

Caltrans will continue to examine opportunities to further refine the Project's construction footprint (the area of construction) during the Project's design phase with the intention of further reducing the Project's environmental impacts.

1.4.6 Alternatives Considered but Eliminated from Further Discussion Prior to Draft Environmental Impact Report/Environmental Assessment (EIR/EA)

This section identifies alternatives that were considered during the Project development process but were eliminated prior to circulation of the Draft EIR/EA. In accordance with Section 15126.6(c) of the CEQA Guidelines, the factors that may be used to eliminate an alternative from detailed consideration in an EIR are (1) failure to meet most of the basic project objectives, (2) infeasibility, or (3) inability to avoid significant environmental impacts. Cost should not be used as a primary determining factor for eliminating an alternative; rather, cost can be one of several considerations in alternative selection.

Several alternatives were proposed in the Project's Project Study Report-Project Development Support (PSR-PDS) document during the Project Initiation Document phase. Adding a northbound express lane in the interchange area is complicated by both the complex configuration of the I-680/SR-24 Interchange, and by the columns associated with the BART overcrossing structure over I-680 north of the interchange. During the preliminary engineering process of the PA/ED phase, the alternatives presented in the PSR-PDS were further examined and refined to determine which best addresses the Project purpose and need while minimizing impacts and delivery risks. Design standards, safety, constructability, third party approvals, traffic operations, and construction and user delay costs were major considerations in determining which solutions would potentially be technically and economically feasible.

The total length of the Project was reduced from PM R4.4/24.5 in October 2023. The northern Project limits were reduced to avoid potential impacts on biological resources and jurisdictional waters near the Waterbird Regional Preserve. The reduction of the northern Project limits would also align better with the Bay Area Toll Authority's planned conversion of the Benicia-Martinez Bridge Toll Plaza to open-road tolling. In addition, the southern Project limits were modified following the elimination of a design option for a 2.75-mile ramp buffer that would have restricted express lane access between the northbound Sycamore Valley Road off-ramp and northbound El Pintado Road on-ramp (see Section 1.4.6.5, *Design Option A*). Figure 1-10 compares the prior Project Study Limits to the updated Project Study Limits.

1.4.6.1 Alternative 1A (From PSR-PDS)

AB 2542 amended California Streets and Highways code to require, effective January 1, 2017, that Caltrans or a regional transportation planning agency demonstrate that reversible lanes were considered when submitting a capacity-increasing project or a major street or highway lane realignment project to the California Transportation Commission (CTC) for approval (California Streets and Highways Code, Section 100.015). Reversible lanes add peak-direction capacity to a two-direction roadway and decrease congestion by using the available capacity from the direction of traffic that is not experiencing peak period congestion.

The Project's PSR-PDS included Alternative 1A, which proposed to construct a northbound contra-flow express lane through the SR-24 Interchange. The northbound contra-flow lane would operate during the afternoon peak traffic period. The northbound contra-flow lane would utilize the existing southbound pavement. Therefore, the alternative would not propose any pavement widening through the SR-24 Interchange. The northbound contra-flow lane would require an 18-inch-wide moveable barrier to separate it from the southbound general-purpose lanes. The moveable barrier's operation would require the purchase, maintenance, and daily operation of a "Zipper Truck" to move the barrier to open and close the northbound contra-flow lane. Given that the Zipper Truck travels at approximately 20 mph, travel to the offsite maintenance facility would likely be limited to night hours when it would be least likely to disrupt traffic. During the afternoon peak period, the proposed shoulder widths on either side of the movable barrier would be zero feet through the entire limits of the contra-flow lane.

A preliminary traffic analysis of Alternative 1A estimated that removing the southbound express lane in the afternoon peak period would negatively impact southbound traffic operations by approximately 2030. The current Project schedule assumes that construction would be complete in 2027. The contra-flow lane would only operate for 3 years before southbound traffic begins to degrade. Ultimately, the bidirectional traffic demand on this segment of I-680 (i.e., northbound and southbound) limits the viability of this alternative as a long-term solution for the corridor.

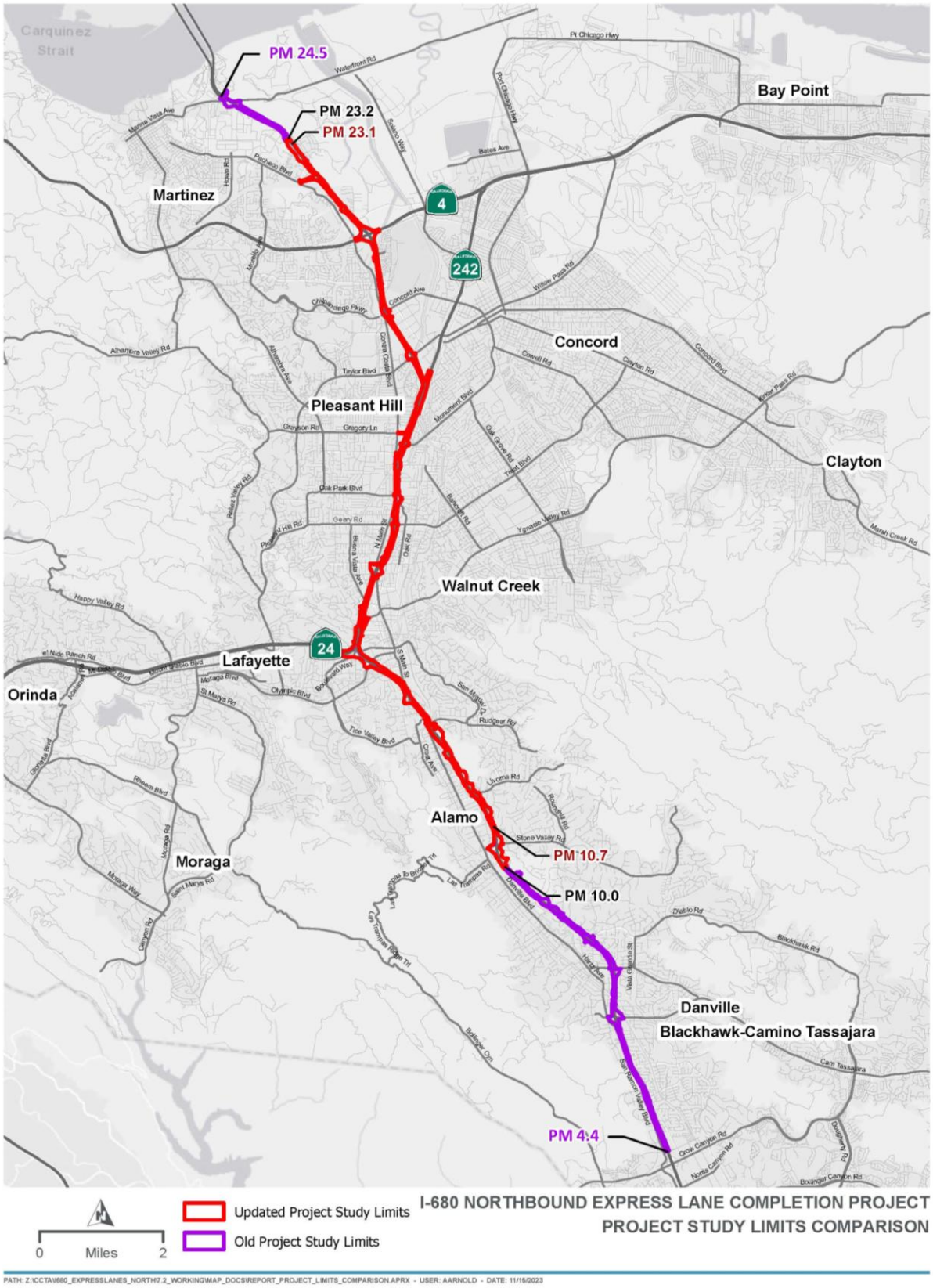


Figure 1-10. Prior Project Study Limits

CCTA also recently completed construction of express lanes on southbound I-680, and there is a permanent median between northbound and southbound I-680. This alternative would require a moveable barrier, which would require dedicated personnel and equipment to routinely shift the location of the barrier on a daily basis, while maintaining safety for the crew working within an active freeway. A movable barrier has been used in other locations but adds annual operating costs and could be considered if adequate funding is allocated.

Ultimately, this alternative was determined to be geometrically infeasible due to the design exceptions that would be needed for a moveable barrier around the curve at the I-680/SR-24 Interchange, and the physical constraints associated with this segment of I-680. These design exceptions included all lane widths on southbound I-680 being non-standard and 0-to-3-foot shoulders. This alternative would require a full closure of the express lane if a collision or other incident occurred. For these reasons, Alternative 1A was eliminated from further discussion because it is infeasible from a highway engineering perspective, requires on-going operations and maintenance costs, and would only provide a short-term traffic operations solution.

1.4.6.2 Alternative 1B (From PSR-PDS)

The Project's PSR-PDS included Alternative 1B, which proposed to close the existing managed lane "gap" by providing a northbound express lane through the SR-24 Interchange. Alternative 1B would require modifying the BART overcrossing structure at this interchange to widen southbound I-680 and the Southbound I-680/Westbound SR-24 Connector. Specifically, this alternative would have required replacing two existing BART columns (Pier 10 and Pier 11) with straddle bents to accommodate a new, northbound, barrier-separated express lane through the I-680/SR-24 Interchange.

BART has been assumed eligible for listing on the National Register of Historic Places under Criterion A and on the California Register of Historic Resources under Criterion 1 for its association with transportation history in the San Francisco Bay Area (JRP Historical Consulting, 2023). This alternative would have required replacing the entire BART overcrossing structure and tracks to the Walnut Creek Station to comply with the latest BART facility standards, potentially adversely affecting this historic property.

The BART overcrossing structure currently has footings below the existing freeway. Alternative 1B would likely require full and partial closures of I-680 and the BART tracks during construction, resulting in long-term adverse transportation impacts during construction. Further, the curvature of southbound and northbound I-680 would be constrained and non-standard shoulder widths would be required, resulting in an operational design speed of 35 mph, which is a reduction from the existing highway speed of 45 mph. Therefore, Alternative 1B was considered but eliminated from detailed evaluation because it is undesirable from a design perspective, carries the risk of design approval from BART, and results in substantial construction impacts to traffic and BART operations. This alternative also did not avoid significant environmental impacts.

Alternative 1C, which is being carried forward for evaluation, is a refined version of Alternative 1B that avoids impacts to the existing BART columns.

1.4.6.3 Collector-Distributor Road (From PSR-PDS)

A separated, three-lane, collector-distributor road was proposed during PSR-PDS. This road would start on northbound I-680 from the northbound North Main Street off-ramp and terminate just north of the existing northbound Truck Scale Facility. The intent of the collector-distributor road was to separate the heavy Lawrence Way on-ramp and Treat Boulevard off-ramp demand from the freeway mainline. Vehicles exiting to North Main Street, Treat Boulevard, and the Truck Scale Facility would use the off-ramp just south of the North Main Street Interchange. The Lawrence Way on-ramp would then merge into the collector-distributor road and the collector-distributor road would enter northbound I-680 just north of the existing northbound Truck Scale Facility. Through further investigation of the geometrics and existing physical constraints between North Main Street and Treat Boulevard, several substantial challenges were identified for this collector-distributor road. The collector-distributor road was ultimately eliminated from further consideration because it would cause substantial impacts to the existing Truck Scale Facility and would likely require the removal or relocation of the Truck Scale Facility. This feature is also less desirable from a design perspective than the braided ramps that were ultimately incorporated into Alternatives 2, 3, and 5 because it resulted in inferior bottleneck and system performance measures, decreasing travel times by more than 10 minutes and reducing unserved demand by nearly 1,800 vehicles from 2 p.m. to 8 p.m.

1.4.6.4 Alternative 4

Alternative 4 had geometry and improvements similar to Alternative 5. However, Alternative 4 would convert a general-purpose lane south of SR-242 to HOV and would not convert the existing HOV lane north of SR-242 to an express lane. Like Alternatives 2 and 5, this alternative would reduce, but not close, the gap in managed lanes on northbound I-680. Alternative 4 would also reduce I-680's capacity, thus avoiding increasing VMT and significant transportation impacts. Preliminary traffic analysis was conducted for Alternative 4 during the PA/ED phase. The traffic analysis determined that Alternative 4 would result in increased congestion on northbound I-680 compared to the No-Build Alterative. Alternative 4 operationally performed worse than No-Build in freeway speeds, travel time, VHD, vehicle throughput, and freeway LOS. Alternative 4 adversely impacts the existing bottlenecks north of SR-24, with queues spilling back to the Oak Road bottleneck, which extends back as far as the study area limits, resulting in extensive congestion on northbound I-680. Therefore, the Project Development Team eliminated this alternative from consideration because it failed to meet most of the Project's basic objectives.

1.4.6.5 Design Option A

An approximate 2.75-mile ramp buffer from PM R6.15 to R8.9 was included as a design option for Alternatives 1C, 2, and 3 during the preparation of the technical studies for

PA/ED. The proposed buffer would have included a striped, double-white line restricting access to the express lane between the northbound Sycamore Valley Road off-ramp and northbound El Pintado Road on-ramp. During preparation of the technical studies for the Project, the Project Study Limits on I-680 were extended temporarily from Livorna Road south to Fostoria Way (PM R4.4) to accommodate an overhead sign structure at the start of the proposed buffer and highway lighting in advance of the buffer (see Figure 1-10). The buffer was explored to address potential traffic congestion and weaving that may occur in this area. This design option would not have resulted in an increase in construction duration or required additional pavement widening, structural modifications, or ROW. Based on traffic modeling results, Design Option A was eliminated from consideration because more detailed traffic modeling did not show that the buffer would improve congestion or weaving, and the Project Study Limits and PM limits were reduced.

1.5 PERMITS AND APPROVALS NEEDED

The following permits, licenses, agreements, and certifications (PLAC) are required for Project construction (see Table 1-14):

Table 1-14. Permits and Approvals

Agency	Permit/Approval	Status
United States Fish and Wildlife Service (USFWS)	Section 7 Consultation for threatened and endangered (terrestrial) species	Concurrence letter from USFWS was received, dated May 7, 2025, following informal consultation (see Appendix F.6).
U.S. Army Corps of Engineers (USACE)	Preliminary Jurisdictional Determination for jurisdictional wetlands and waters of the United States Section 404 Permit for filling or dredging waters of the United States	A preliminary jurisdictional delineation application was submitted to USACE for concurrence on October 12, 2023, and resubmitted on February 15, 2024. Preliminary jurisdictional determination was received, dated September 12, 2024 (see Appendix F.4). Nationwide Permit 14 pre-construction notification would be submitted during the design phase.
California Department of Fish and Wildlife (CDFW)	Section 1602 Agreement for Streambed Alternation Section 2080.1 Agreement for Threatened and Endangered Species	Applications for Section 1602 will be submitted to CDFW after Final Environmental Document approval, during the design phase. Incidental take of CDFW listed species is not currently anticipated.

Agency	Permit/Approval	Status
San Francisco Bay Regional Water Quality Control Board (RWQCB)	Clean Water Act Section 401 Water Quality Certification or Waste Discharge Requirements (WDR) National Pollution Discharge Elimination System (NPDES)	Water Quality Certification or WDR will be sought from RWQCB during the final design phase. NPDES application will be submitted in the design phase, prior to construction. Notice of Intent and Storm Water Pollution Prevention Plan will be prepared and submitted prior to construction.
State Historic Preservation Officer (SHPO)	National Historic Preservation Act (NHPA) Section 106 consultation	Concurrence letter from SHPO received, dated April 17, 2024 (see Appendix F.3).
Air Quality Conformity Task Force	Project of Air Quality Concern Determination	Task Force determined the Project was not a project of air quality concern on December 19, 2023 (see Appendix F.1).
Federal Highway Administration (FHWA)	Clean Air Act Conformity Determination	Air Quality Conformity Application was submitted to FHWA following public review of the Draft EIR/EA. FHWA approval received via letter, dated June 23, 2025 (see Appendix F.1).
Official(s) with Jurisdiction	Section 4(f) *De Minimis* Concurrences	Notification letter was sent to SHPO for historic sites Caltrans *de minimis* impact determination for the Bay Area Rapid Transit property as part of the Section 106 consultation. Concurrence was received from East Bay Parks regarding the *de minimis* impact determination for the Iron Horse Regional Trail and the Contra Costa Canal Trail/ Briones to Mount Diablo Regional Trail, dated October 30, 2024 (see Appendix A).
California Transportation Commission (CTC)	CTC vote to approve Project funds	Following Caltrans' approval of the Final Environmental Document and posting the Notice of Determination with the State Clearinghouse, CTC approval will be required to allocate any CTC-managed funding for the Project.
Bay Area Rapid Transit (BART)	Construction Permit/Plan Review	Additional coordination with BART will be conducted and an application will be submitted during final design.
California Department of Transportation (Caltrans)	Encroachment Permit(s)	Encroachment permits would be needed for investigations conducted during the design phase and for construction activities within Caltrans ROW.

Agency	Permit/Approval	Status
Contra Costa County Public Works and other Local Agencies	Encroachment Permit(s) and/or Right(s) of Entry	Encroachment permit(s) and/or right(s) of entry would be needed for investigations conducted during the design phase and/or construction activities within County or City ROW.

Chapter 2 Affected Environment, Environmental Consequences and Avoidance, Minimization, and Mitigation Measures

This chapter addresses the proposed Project's environmental impacts. The environmental resource discussions presented in this chapter are based on the technical studies cited at the beginning of each discussion. An evaluation of the proposed Project, consistent with the California Environmental Quality Act (CEQA) checklist criteria, is provided in Chapter 3. Avoidance, minimization, and/or mitigation measures are discussed in the following sections and summarized in Appendix C, *Avoidance, Minimization, and Mitigation Summary*.

For the proposed Project, the CEQA baseline for all resource areas is generally 2020, when environmental studies commenced. The National Environmental Policy Act (NEPA) baseline for comparing environmental impacts is the No-Build Alternative.

2.0 TOPICS CONSIDERED BUT DETERMINED NOT TO BE RELEVANT

As part of the scoping and environmental analysis carried out for the Project, the following environmental issues were considered, but no adverse impacts were identified. As a result, there is no further discussion about these issues in this document.

2.0.1 Coastal Zone

The Project is not located within the coastal zone or San Francisco Bay Conservation and Development Commission jurisdiction. Therefore, the Project would not have a foreseeable effect on coastal zone use or resources.

2.0.2 Wild and Scenic Rivers

No wild and scenic rivers are located in or adjacent to the Project Study Limits. Therefore, the Project would not affect wild and scenic rivers.

2.0.3 Farmlands/Timberlands

None of the lands within or immediately adjacent to the Project Study Limits are designated as important farmland (i.e., prime farmland, unique farmland, or farmland of statewide or local importance) (California Department of Conservation, 2016). The California Department of Conservation identifies the Sugarloaf Open Space and several unincorporated parcels north of State Route (SR) 4 as grazing land. These parcels are not designated for agricultural land use in either the City of Walnut Creek's *General*

Plan Land Use Map (2023) or Contra Costa County's *General Land Use Plan Map* (Contra Costa County Department of Conservation, 2021). The Project would not convert any important farmland or conflict with current land use designations, including farmlands.

No timberlands exist in or adjacent to the Project Study Limits; therefore, the Project would not affect timberlands.

2.0.4 Relocations and Real Property Acquisition

The Project would require permanent and temporary slivers of right-of-way (ROW), as described in Section 1.4.2, *Unique Features of Build Alternatives*. However, the Project would not result in the permanent or temporary relocation or displacement of any home or business. Refer to Table 2.1.1-3, *Potential Right-of-Way Acquisitions by Build Alternative*, in Section 2.1.1, *Existing and Future Land Use*, for more information regarding potential ROW. ROW estimates are preliminary and are subject to final design, coordination with utility providers, and negotiations with landowners.

During the public comment period for the Draft Environmental Impact Report/ Environmental Assessment, the City of Walnut Creek expressed concern regarding the impact the partial acquisition of Corporation Yard would have on ongoing and future operations of the City of Walnut Creek's Corporation Yard at 511 Lawrence Way and requested to be made whole (Comment A-05, in Appendix G, *Comment Letters and Responses*).

Alternative 2 has been selected as the preferred alternative. As shown in Table 2.1.1-3, *Potential Right-of-Way Acquisitions by Build Alternative*, all Build Alternatives except Alternative 1C, would require a temporary construction easement (approximately 6,780 square feet) and a permanent partial acquisition (approximately 13,631 square feet) of 511 Lawrence Way for construction of braided ramps at Treat Boulevard. Per the City of Walnut Creek's comment letter, the Corporation Yard houses and supports a wide array of functions for the City's Public Works Department, including managing its vehicle fleet and repair of its streets and park infrastructure. The Corporation Yard is an essential services facility used to store all equipment, materials, and fuel used to respond to natural and human-caused disaster events. It also serves as a staging area for public safety deployment by the City of Walnut Creek Police Department. All ROW acquisitions and utility relocations would be further defined during final design in coordination with landowners and utility service providers. California Department of Transportation (Caltrans) and Contra Costa Transportation Authority (Project Sponsor) will continue to work with the City of Walnut Creek to minimize and avoid permanent and temporary impacts on operations at the Corporation Yard during final design. At this time, Caltrans does not anticipate any relocations or displacements will be required.

2.1 HUMAN ENVIRONMENT

2.1.1 Existing and Future Land Use

2.1.1.1 Affected Environment

This following discussion is based on the proposed Project's *Community Impact Assessment* (HDR Engineering, Inc., 2023), which was completed in November 2023.

The Community Impact Study Area is depicted in Figure 2.1.1-1. The Community Impact Study Area was defined as the area within 0.5 mile of the prior Project Study Limits (R4.4/24.5; see Figure 1-10), which were reduced in October 2023. The Community Impact Study Area was expanded to the south to include a potential buffer area (i.e., Design Option A) that was removed from consideration.

The Community Impact Study Area is completely within Contra Costa County and passes through the town of Danville and the cities of Martinez, Concord, Pleasant Hill, Walnut Creek, Lafayette, and San Ramon. In addition, the Community Impact Study Area includes the following census designated places (CDP): Vine Hill, Mountain View, Pacheco, Contra Costa Center, Acalanes Ridge, Saranap, San Miguel, Castle Hill, and Alamo (see Figure 2.1.1-1).

Within the Community Impact Study Area, approximately 55 percent of the land use is residential (see Table 2.1.1-1), according to the Metropolitan Transportation Commission's (MTC) latest land use dataset (Metropolitan Transportation Commission, 2021). The rest of the Community Impact Study Area has a more even distribution of land uses, with the second-most prevalent land use designated as commercial (almost 13 percent), and the third-most being education/public use (roughly 10 percent). A review of the land use maps for each jurisdiction within the study area shows that they are generally consistent with the corresponding zoning designations.

Table 2.1.1-1. Existing Land Use within the Community Impact Study Area

Land Use Type	Area (Acres)	Percentage (%)
Agriculture/Resource Extraction	328.04	2.3%
Commercial	1812.35	12.8%
Education/Public/Semi-Public	1463.82	10.3%
Industrial	1094.90	7.7%
Mixed Use	186.16	1.3%
Mixed Use: Agriculture/Resource & Parks/Open Space	0.01	0%
Mixed Use: Other	0.02	0%
Other/Unknown	274.49	1.9%
Parks/Open Space	1199.49	8.4%
Residential	7852.22	55.3%
Total	14211.49	100%

Source: (Metropolitan Transportation Commission, 2021)

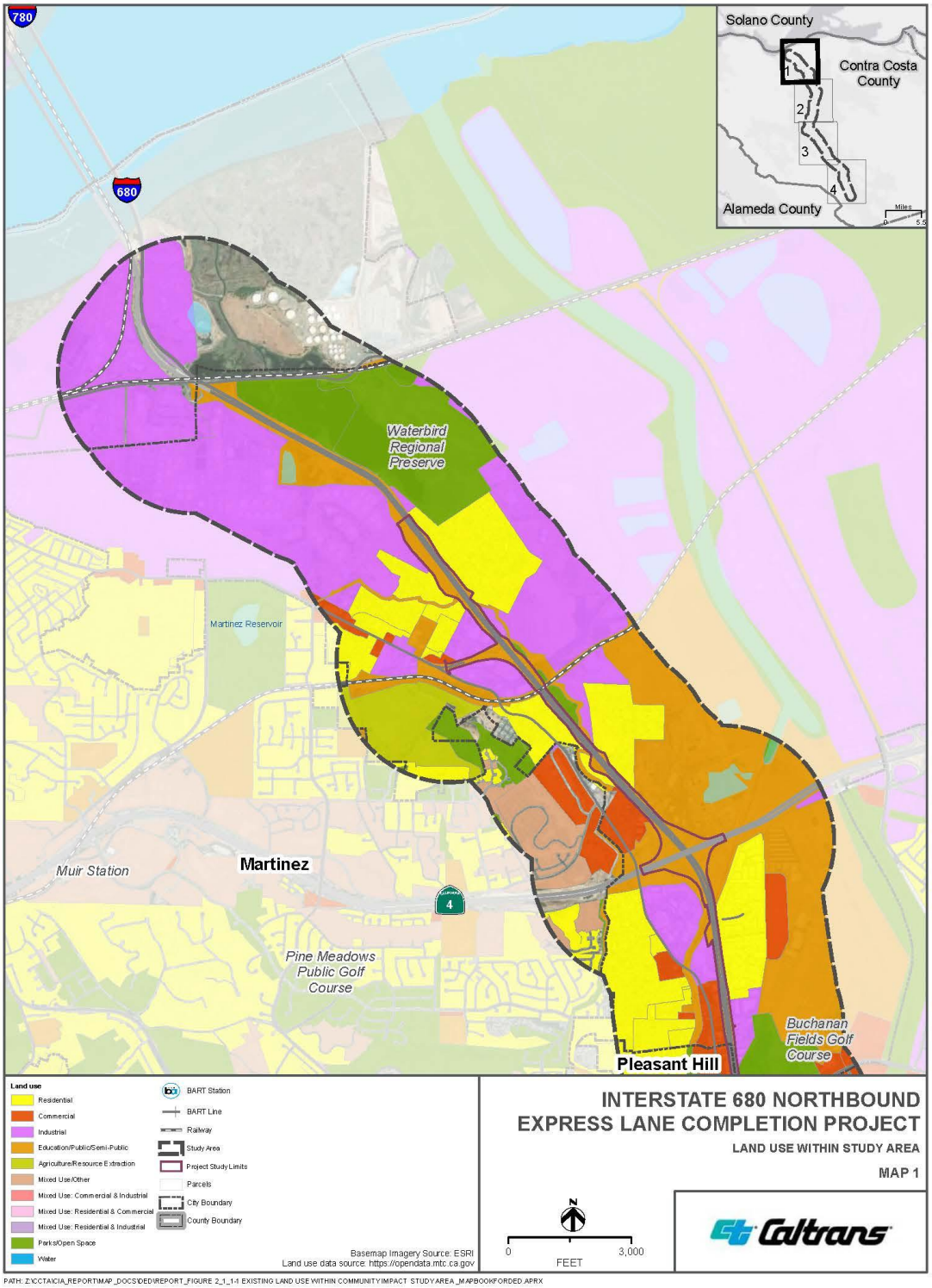


Figure 2.1.1-1. Existing Land Use within Community Impact Study Area (Map 1 of 4)

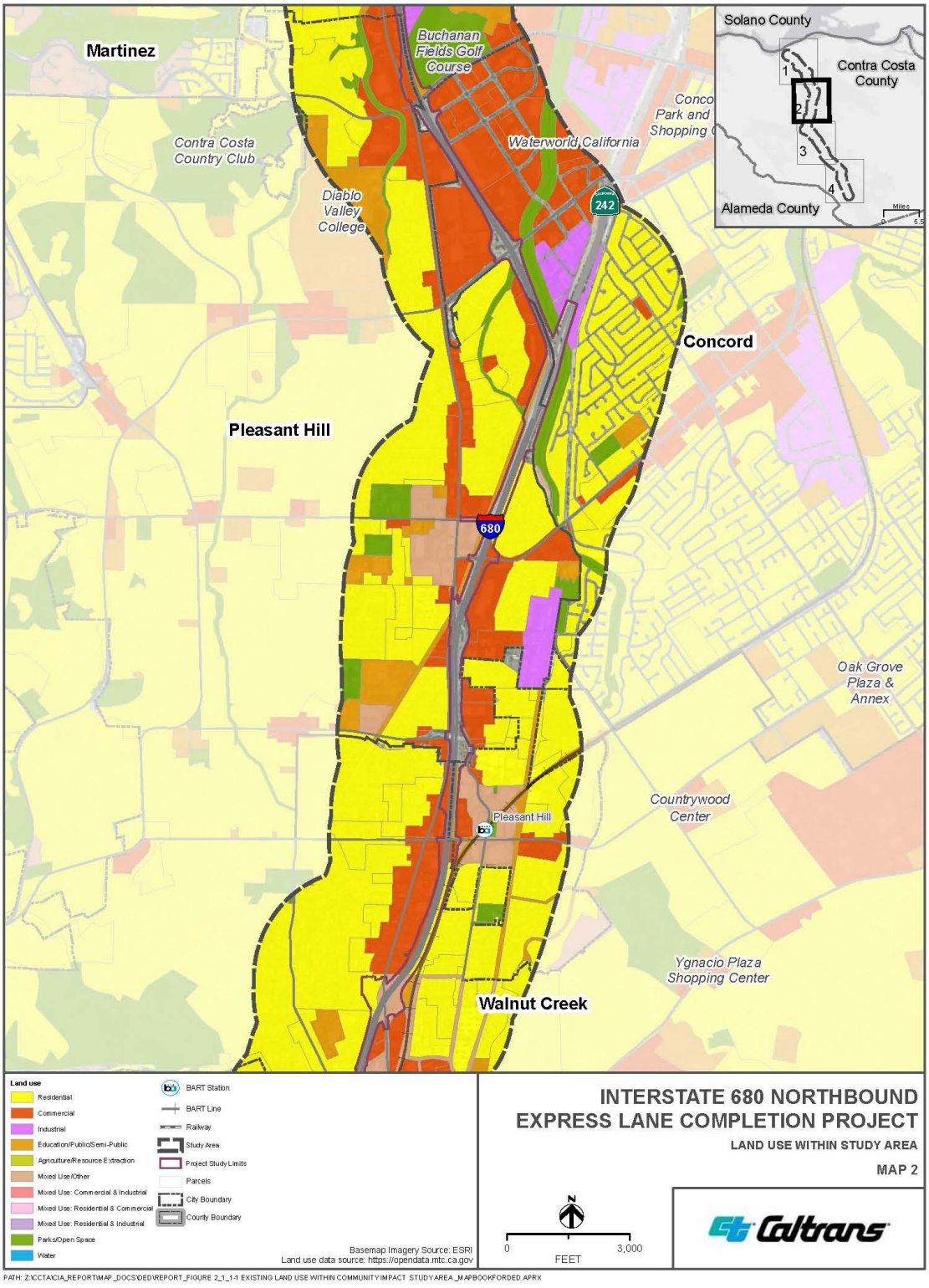


Figure 2.1.1-1. Existing Land Use within Community Impact Study Area (Map 2 of 4)

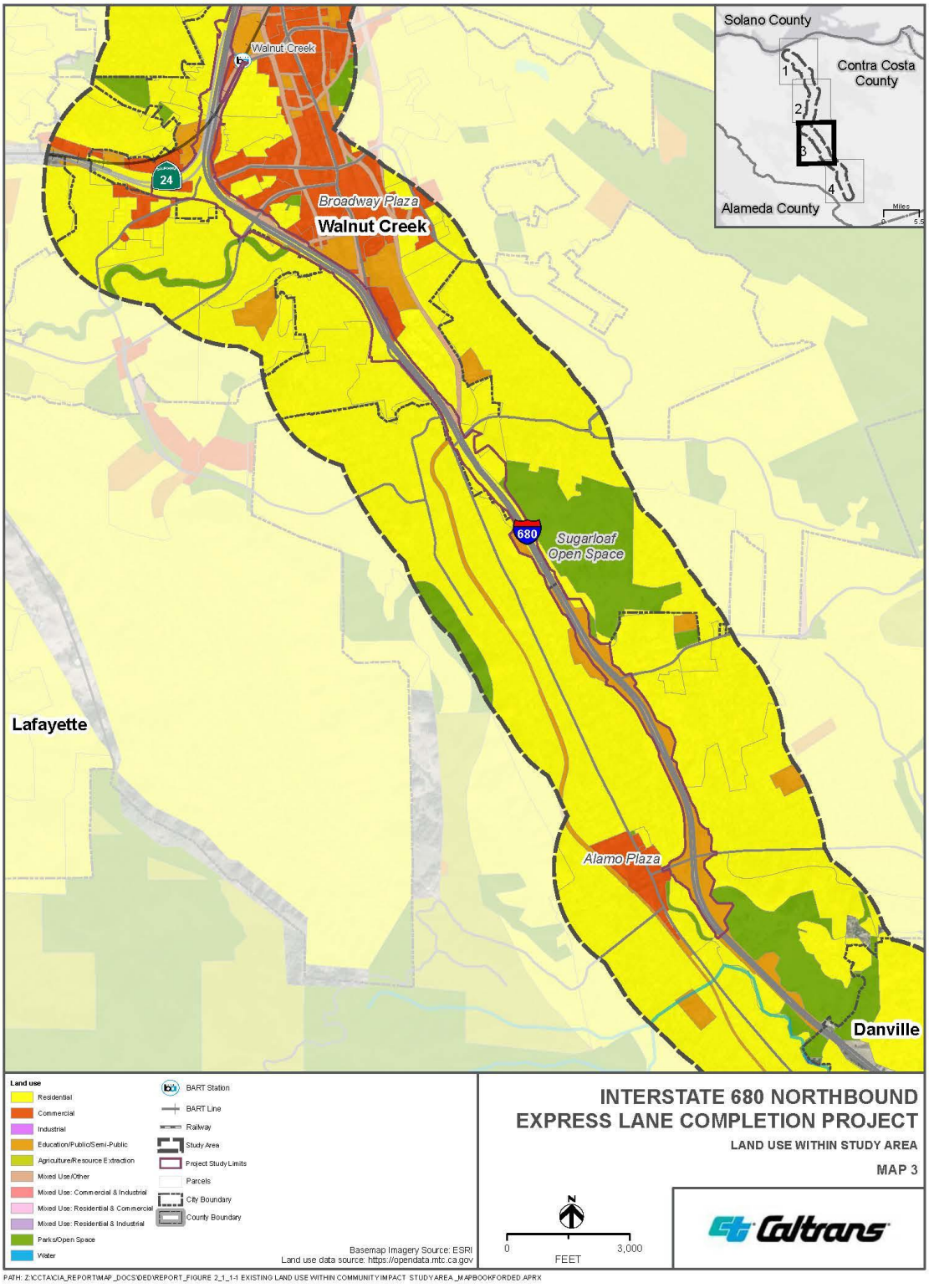


Figure 2.1.1-1. Existing Land Use within Community Impact Study Area (Map 3 of 4)

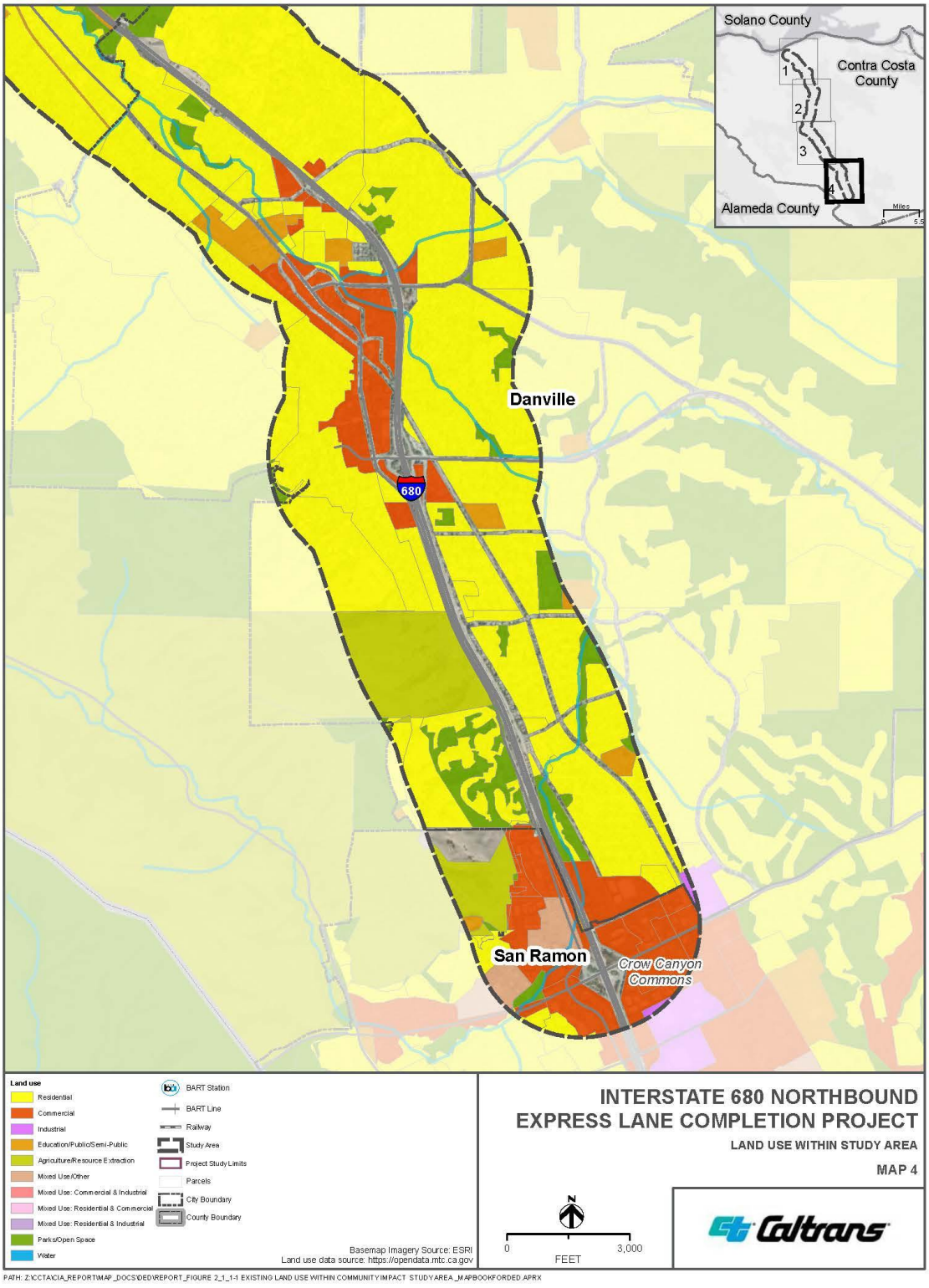


Figure 2.1.1-1. Existing Land Use within Community Impact Study Area (Map 4 of 4)

Development Trends

Future Land Uses

Plan Bay Area 2050 is the Bay Area's long-range strategic plan focused on the interrelated elements of housing, the economy, transportation, and the environment (Association of Bay Area Governments and Metropolitan Transportation Commission, 2021). According to *Plan Bay Area 2050*, best estimates suggest the Bay Area's population will rise from nearly 8 million to over 10 million residents between 2020 and 2050, reflecting a 25 percent increase.

California Department of Finance (CDF) forecasts indicate that Contra Costa County is expected to grow consistently by at least 1 percent each year (California Department of Finance, 2019). Additional population and employment growth within the Community Impact Study Area is expected to take place through the natural increase and redevelopment of existing land uses or infill development of vacant parcels.

Land uses within the Community Impact Study Area are already established, with limited opportunity for a new, unplanned, large-scale development. Due to the lack of undeveloped vacant private land in the Community Impact Study Area, there are limited opportunities for large-scale new development to occur in the study area.

Planned Future Development Projects

Table 2.1.1-2 provides a list of planned future development projects within the Community Impact Study Area. The information in Table 2.1.1-2 was obtained by reviewing CEQAnet (Governor's Office of Planning and Research, 2023) as well as planning documents from Contra Costa County, East Bay Regional Park District, MTC, and the cities of Concord, Martinez, Pleasant Hill, San Ramon, and Walnut Creek and Town of Danville.

Table 2.1.1-2. Planned Future Development Projects

Name	Jurisdiction	Description of Project	Status
Oak Park Properties Specific Plan	City of Pleasant Hill	*The City of Pleasant Hill Specific Plan* contemplates two development projects (the Civic project and the Residential project) within the *Specific Plan* area (plan area) boundaries. The Civic project would include construction of library facilities, a park, vehicular parking, roadway improvements, the creation of a new floodplain system with water detention basins, upgrading three existing	**Proposed.** The *Specific Plan* was adopted by the City of Pleasant Hill City Council on May 4, 2020.

Name	Jurisdiction	Description of Project	Status
		outfalls to Grayson Creek, and the creation of a new pedestrian trail immediately west of the Grayson Creek Corridor. The Residential project would include demolition of the vacant administrative offices, the County library building, the paved parking lot, trees, and landscaping for development of 34 single-family dwelling units, seven accessory dwelling units, and a new pocket park.	
State Route (SR) 4 Capital Preventative Maintenance Project	California Department of Transportation (Caltrans)	Caltrans proposes to resurface existing pavement, upgrade metal beam guard rails, improve drainage, and replace/upgrade curb ramps to meet Americans with Disabilities Act standards. The purpose is to preserve and extend the service life of pavement structures, improve motorist safety, and meet Americans with Disabilities Act standards.	**Proposed.** The Notice of Exemption for a Categorical Exemption was posted on June 28, 2019.
I-680 Roadway Repair	Caltrans	Roadway repairs will occur at six locations along Interstate 680 (I-680) from post mile (PM) 22.19 to 24.25.	**Proposed.** The Notice of Exemption for a Categorical Exemption was posted on June 24, 2022.
Restore Pavement	Caltrans	Restore uneven pavement, cold planning, and hot mix asphalt (HMA) repaving at PM 8.6 on Route 680 in the town of Danville, County of Contra Costa County.	**Proposed.** The Notice of Exemption for a Categorical Exemption was posted on March 22, 2022.
Bridge Preservation Project	Caltrans	Work will include placing polyester concrete deck overlay, treating bridge deck with methacrylate, applying polyurethane under slabs to remove offset, repairing spalls, repairing asphalt concrete approaches, replacing joint	**Proposed.** The Notice of Exemption for a Categorical Exemption was posted on March 15, 2022.

Name	Jurisdiction	Description of Project	Status
		seals, and upgrading drainage systems on I-680 between PM 12.61 and PM 24.26.	
Bridge Preservation Project	Caltrans	Work will include overlaying polyester on bridge decks, removing and replacing rail work at six bridges (Bridge Numbers 28-0221, 28-0222, 28-0199, 28-0200, 28-0166, and 28-0162). All removed delineation will be replaced.	**Proposed.** The Notice of Exemption for a Categorical Exemption was posted on March 8, 2022.
Bridge Preservation	Caltrans	Cleaning and placing methacrylate on the deck of bridge 28-0274 on I-580. Paint bridge ID at both approaches/abutments. Methacrylate will also be placed on the deck of Bridge 28-0128R on I-680.	**Proposed.** The Notice of Exemption for a Categorical Exemption was posted on July 6, 2021.
Pavement Settlement	Caltrans	Repair pavement settlement at Bollinger Canyon Road overpass toward southbound I-680, PM 2.89 in San Ramon, Contra Costa County.	**Proposed.** The Notice of Exemption for a Categorical Exemption was posted on June 21, 2021.
Corridor & Interchange Improvements Contra Costa County I-680	Caltrans	Implement interchange improvements at SR-4, as well as new auxiliary lanes between Rudgear Road and El Cerro Boulevard and between Bollinger Canyon Road and Alcosta Boulevard.	**Under Construction.** Phase 3 construction is complete.
Corridor & Interchange Improvements SR-4 Contra Costa County	Caltrans	Implement Integrated Corridor Mobility between I-80 and SR-160 and operational improvements between Port Chicago Highway and San Marcos Boulevard/Willow Pass Road.	**Built.** According to the project schedule, construction and system integration began in 2017 and was completed by 2020.
Corridor & Interchange Improvements SR-242 Contra Costa County	Caltrans	Implement interchange improvements at Clayton Road and SR-242.	**Proposed.** Anticipated for completion between 2036 and 2050. The project is on hold while funding for future phases is being identified.

Name	Jurisdiction	Description of Project	Status
15-Minute Bay Area Rapid Transit (BART) Feeder Network	Central Contra Costa County Transit Authority's (CCCTA d/b/ "County Connection")	Make County Connection services a viable alternative to driving a car. The system needs to consider increasing frequency during the peak commute periods.	**Proposed.** This project was outlined as a potential project in CCCTA *2016–2025 Short Range Transit Plan*.
Civil Infrastructure for Open Road Tolling Conversion	Caltrans and Bay Area Toll Authority	Proposes to convert existing toll facilities to open road tolling systems at the Antioch Bridge, Benicia-Martinez Bridge, and Carquinez Bridge toll facilities.	**Proposed.** Final design phase anticipated to begin in 2025.
I-680 Corridor Service Improvements	Contra Costa Transportation Authority (CCTA)	Enhanced transit service within the I-680 corridor, which includes new park and ride facilities constructed near I-680, more direct and local bus services between park and ride facilities and BART stations, the addition of auxiliary lanes on I-680 to allow buses to operate along the shoulders and bypass peak period congestion, and increased school bus service.	**Proposed.** This project was outlined as a potential project in CCCTA's *2016–2025 Short Range Transit Plan*. Pilot testing for Part Time Transit Lane is anticipated to begin in 2025.
Iron Horse/BART Connector South	East Bay Regional Park District, Contra Costa County	Provide connection from BART Connector South Station to Iron Horse Regional Trail.	**Planned.** Planned project within the *2017 Countywide Transportation Plan, Central County Action Plan*.
Iron Horse Trail to Walnut Creek BART North	East Bay Regional Park District, Contra Costa County	Provide connection from BART Walnut Creek Station to Iron Horse Regional Trail.	**Planned.** Planned project within the 2017 Countywide Transportation Plan's Central County Action Plan.
Bayview Residential Project	Contra Costa County	The project proposes 144 single-family homes and associated internal roadways on an approximately 78-acre project site in the Vine Hill/Pacheco Boulevard area. The project also proposes four open space parcels, one of which is proposed as a park.	**Approved.** The project was approved by the County Board of Supervisors on April 26, 2022.

Name	Jurisdiction	Description of Project	Status
		To accomplish this, the applicant is requesting a General Plan Amendment from Heavy Industrial (HI) to Residential (SH), and Open Space (OS). The project is also requesting to Rezone the project site from Heavy Industrial (H-I) to Planned Unit Development (P-1).	
Martinez Refinery Renewable Fuels Project	Contra Costa County	On November 1, 2020, Tesoro Refining & Marketing Company LLC, an indirect, wholly owned subsidiary of Marathon Petroleum Corporation, submitted an application for a Land Use Permit to implement the Martinez Refinery Renewable Fuels Project. The permit would allow the conversion of Marathon's Martinez Refinery facility from the processing of crude oil to the processing of renewable feedstocks. The feedstocks would be processed into renewable diesel, naphtha, propane, and treated fuel gas.	**Approved.** The County Board of Supervisors unanimously approved the project at their May 3, 2022, hearing.
Oak Road Townhouse Condominiums	Contra Costa County	The 5.94-acre project site consists of eight parcels and is located at 2740 Jones Road, southeast of the intersection of I-680 and Treat Boulevard, within unincorporated Contra Costa County and adjacent to Walnut Creek. The proposed project includes rezoning of the project site from Multiple-Family Residential (M-17 and M-29) and Single-Family Residential (R-15) to a Planned Unit District (P-1) and approval of a vesting tentative map reconfiguring the current eight parcels into 19 new residential	**Proposed.** The Final EIR and Mitigation Monitoring Report Program were posted on January 12, 2022.

Name	Jurisdiction	Description of Project	Status
		parcels. The proposed project would involve a development plan to allow the demolition of all existing improvements currently present on-site, including buildings, foundations, asphalt, concrete, fence poles, and landscaping.	
Spieker Senior Continuing Care Community Project	Contra Costa County	The Spieker Senior Continuing Care Community Project includes development of a self-contained continuing care retirement community, offering continuing care contracts that provide for housing, resident services, and long-term care. The Project Site consists of two existing parcels containing approximately 30.4 acres, situated in the unincorporated Walnut Creek area at the eastern end of Seven Hills Ranch Road.	**Approved.** The project was scheduled and heard before the County Board of Supervisors on November 29, 2022, and the Board approved the project unanimously.
I-680/Treat Boulevard Bicycle & Pedestrian Improvements	Contra Costa County	The project would provide a plan that identifies improvements to serve bicyclists and pedestrians using the I-680/Treat Boulevard corridor between the Iron Horse Trail, through the I-680 Overcrossing ("Overcrossing") near the Contra Costa Centre/Pleasant Hill BART Station area and extending west to Geary Road/North Main Street in Walnut Creek. The I-680/Treat Boulevard Overcrossing is one of the main arteries into the Contra Costa Centre/Pleasant Hill BART Station area from areas of Walnut Creek west of the freeway.	**Complete.** The County Board of Supervisors approved the plan on May 1, 2018. The final plan is complete and available to the public.

Name	Jurisdiction	Description of Project	Status
Treat Boulevard Corridor Improvements	Contra Costa County	The project includes bicycle and pedestrian infrastructure enhancements along the Treat Boulevard Corridor between North Main Street and Jones Road and along North Main Street from Treat Boulevard to Lesnick Lane.	**Proposed.** Notice of exemption was completed in February 2025. Construction is anticipated to begin in 2026.
Iron Horse Corridor Active Transportation Study	Contra Costa County	This Study explored opportunities and constraints for further developing the active transportation features within the Iron Horse Corridor.	**Complete.** The final study was posted on the County's website in June 2020.
Amare Apartment Homes Project	City of Martinez	The project is located within the Martinez in Contra Costa County. The project site is approximately 6.06 acres and located between Arnold Drive and SR-4 on assessor parcel numbers (APN) 161-400-009 and 161-400-010. The proposed project would involve the construction of six buildings that include 104 one-bedroom units and 79 two-bedroom units for a total of 183 residential dwelling units. In addition, the proposed apartment complex would include on-site amenities, such as a workout facility, business center, children's play area, outdoor kitchen area and parking areas.	**Approved.** On October 11, 2022, following a public hearing, the Planning Commission certified the Final Environmental Impact Report (FEIR), adopted the Statement of Overriding Considerations, and approved the Mitigation Monitoring and Reporting Program (MMRP) for the project. Following action on the Final EIR, the Planning Commission approved the Design Review Permit and Density Bonus applications, subject to conditions of approval.
Sunrise Self-Storage	City of Martinez	The project site is located between Pacheco Boulevard and Sunrise Drive on the eastern boundary of Martinez. The site is located approximately 700 feet (0.13 mile) west of Highway 680 and approximately 2,370 feet (0.45 mile) north of Highway 4. The project	**Approved.** The Sunrise Self-Storage Project was approved by the Martinez Planning Commission at a regular meeting held on October 26, 2021.

Name	Jurisdiction	Description of Project	Status
		site consists of five parcels: APN 161-021-005, 161-021-006, 161-021-007, 161-021-008, and 161-021-009. The proposed project would develop the project site with a new 160,450-square-foot self-storage facility.	
Walnut Creek BART Transit Village	City of Walnut Creek	The project will construct 596 residential apartment units and a 30,000-square-foot, commercial (Phases 2 and 3) parking garage for 1,500 vehicles at 200 Ygnacio Valley Road	**Under Construction.** Phase 1 is complete. Phase 2 is currently under construction
1910 Noma	City of Walnut Creek	Proposed development of a 0.97 net-acre property with a six-story, mixed-use building consisting of 135 residential units and approximately 7,000 square feet of commercial space on the ground floor at 1910 North Main Street.	**Proposed.** The project is currently under review by the City of Walnut Creek.
1380 N. California	City of Walnut Creek	A new six-story, mixed use building consisting of 70 apartment units, 20 hotel rooms, above ground level retail (16,323 square-foot), and a three-level basement garage at 1380 N. California.	**Under Construction.** The project is anticipated to be complete by early 2023.
Harb MF Residential	City of Pleasant Hill	Major subdivision, new multi-family residential complex, density bonus at 230-240 Cleaveland Road.	**Proposed.** The project is currently under review by the City of Pleasant Hill.
Blake-Griggs Multi-Family Development	City of Pleasant Hill	General Plan amendment and related entitlements for a 189-unit multi-family project at 85 Cleaveland Road.	**Approved.** The project was approved by the City Council on March 16, 2021. The project is pending post approval follow-up.
Kamali Townhomes	City of Pleasant Hill	Eight-unit residential project at 170 Cleaveland Road.	**Proposed.** The project application is currently incomplete.

Name	Jurisdiction	Description of Project	Status
Starbucks w/ Drive-Thru	City of Pleasant Hill	Permits for a new Starbucks at 999 Contra Costa Boulevard.	**Approved.** The project was approved by the Planning Commission and is pending post approval follow up.
Chick fil-A	City of Concord	Demolition of existing Claim Jumper and construction of 4,947-square-foot drive-thru restaurant within the Willows Shopping Center at 1981 Diamond Boulevard.	**Under Construction.** The Planning Commission approved the project on December 21, 2022.
Dialysis Center	City of Concord	The project would construct a 17,268 square-foot medical office building and associated site improvements for use as a Medical Services Facility (DaVita dialysis center) located at 1225 Willow Pass Road.	**Completed.** The latest Design Review Board Staff Report is dated August 13, 2020.
Autopia Car Wash	City of Concord	Construct a new 3,669 square-foot, full-service carwash and detail center.	**Completed.**
Concord Senior Housing	City of Concord	The project would construct 63 senior affordable units within a six-story building.	**Under Construction.**
375 & 359 West El Pintado Road Senior Housing Project	Town of Danville	The project would include development of a 57-unit senior housing community at 375 and 359 West El Pintado Road in the Town of Danville. The senior housing community would include one-, two-, and three-bedroom units; landscaping improvements; parking area; and on-site mitigation area creation. This is an Addendum to the 2018 certified 375 West El Pintado Road Residential Project EIR.	**Approved.** In December 2018, the Danville Town Council approved the 375 West El Pintado Road Residential Project and the associated project EIR. An EIR addendum was prepared in June 2022 and posted to CEQAnet in July 2022.
Burger King Remodel	City of San Ramon	The Applicant is proposing to update the exterior and alter the drive through approach area at the Burger King located at 3240 Crow Canyon Road.	**Application Under Review**

Name	Jurisdiction	Description of Project	Status
3181 Crow Canyon Place	City of San Ramon	Addition of 257 outdoor seating spaces	**Application Under Review**
2010 Crow Canyon Place	City of San Ramon	Application for a Planning submittal for the telecommunications facility located at 2010 Crow Canyon Place. There will be a new generator installed in the existing lease to an existing wireless facility.	**Application Under Review**
Iron Horse Village Development Project	City of San Ramon	Request for a Development Plan, Major Subdivision, Tree Removal Permit, and Environmental Review applications for a new, 117-residential-unit development proposal, including the following: • Demolish approximately 212,000 square-feet of existing office buildings and associated parking lot and landscape; • Construct 86 single-family, detached condominium units (with an option for up to 64 attached Junior Accessory Dwelling Units [JADU]); • Construct 31 multi-family townhome units (including 8 live/work units); • Subdivide the project area with a Vesting Tentative Map for Condominium Purposes	**Application Under Review**
Camp Bow Wow Development	City of San Ramon	Request for development entitlements to construct a new 8,280 square-foot, single-story building with a 21-space parking lot and landscape on an existing 0.60-acre vacant parcel at 2040 Faria Preserve Parkway. The tenant would	**Under Construction.** The Building Permit was issued in 2019.

Name	Jurisdiction	Description of Project	Status
		be a new Animal Services – Boarding/Training land use (Camp Bow Wow) for up to 86 dogs at any one time. The project also includes a Minor Exception to reduce the perimeter landscape width and a Minor Exception to allow a 5-foot-high retaining wall.	
2590 San Ramon Valley	City of San Ramon	Request for approval for a new 40-foot-tall wireless telecommunications facility at the public storage facility at 2590 San Ramon Valley Boulevard	**Approved.** The project was approved in January 2022.
Home Depot Tool Rental Center	City of San Ramon	Request for approval of a Development Plan Amendment, Minor Use Permit, and Architectural Review applications to construct an approximately 4,473-square-foot building addition and an approximately 1,294-square-foot enclosure for a new tool rental center operation, including the rental of tools, equipment, and trucks, at 2750 Crow Canyon Road. The project also includes a new Minor Use Permit to replace a previously approved outdoor storage area Minor Use Permit.	**Approved.** The project was approved in April 2022.
2671 Crow Canyon Road	City of San Ramon	Request for approval to convert an existing office building to a 10,225-square-foot day care for up to 165 students. Project proposal includes modifications to the parking lot to accommodate the proposed land use and traffic circulation.	**Approved.** The project was approved in April 2022.
2001 Omega Road	City of San Ramon	T-Mobile Minor Modification	**Approved.** The project was approved in April 2022.

Name	Jurisdiction	Description of Project	Status
2416 San Ramon Valley Boulevard 200	City of San Ramon	Application for a business that would provide semipermanent makeup that will be tattooed on the face, brows, eyeliner, and lips.	**Approved.** The project was approved in April 2022.
2770 Old Crow Canyon Road	City of San Ramon	Minor Use Permit Application for Parking Reduction.	**Approved.** The project was approved in July 2022.
3130 Crow Canyon Place	City of San Ramon	New Dish Telecommunications Facility	**Approved.** The project was approved in August 2022.
The Preserve Development	City of San Ramon	Request for a vesting tentative map, architectural review, and development plan amendment for a 600-unit residential subdivision.	**Under Construction.** The Building Permit was issued in October 2012.
San Ramon Apartments	City of San Ramon	A mixed-use development consisting of 169 apartment units with 6,146 square feet for commercial uses.	**Approved.** The project was approved in February 2015.
Promenade at the Preserve	City of San Ramon	Request for a Development Plan application for a 40-unit, single-family residential development and a 122-unit, multi-family development on a 10.6-acre parcel.	**Approved.** The Build Permit was issued in September 2018.
BR 6 Residential Development	City of San Ramon	Proposal to demolish three existing office buildings and develop a new 404-unit, for-sale residential project on a 31-acre site located at 2400-2440 Camino Ramon.	**Approved.** The project was approved in January 2021.
TTLC Townhomes	City of San Ramon	Proposal to construct 57 dwelling units within six multi-family buildings of varying sizes on an existing 2.46-acre lot located at 500 Deerwood Road.	**Approved.** The project was approved in January 2021.
47-Unit Town Home Project	City of San Ramon	Proposal to construct 47 condo units within eight multi-family buildings of varying sizes on an existing 3.57-acre lot located at 2701 Hooper Drive.	**Approved.** The project was approved in April 2021.

Name	Jurisdiction	Description of Project	Status
City of San Ramon General Plan 2040 Update	City of San Ramon	*General Plan 2040* Update	**In Review.** The General Plan has been under review since June 2021.
North Camino Ramon Specific Plan Amendment	City of San Ramon	Request by the Applicant (Crow Canyon Commons Shopping Center Property Owner – Federal Realty Crow Canyon, LLC) to amend the *North Camino Ramon Specific Plan* to allow the Crow Canyon Commons Shopping Center, located at 3181 Crow Canyon Place, up to 40 percent non-retail land uses.	**In Review.** This application has been under review since January 2022.
Coordinated Adaptive Ramp Metering Project	Caltrans	The Coordinated Adaptive Ramp Metering (CARM) project will implement an adaptive ramp metering system on northbound I-680 between Alcosta Boulevard and Olympic Boulevard initially, and a future phase will expand that to both directions of I-680 in Contra Costa to proactively manage recurrent and non-recurrent congestion.	**Proposed.** The project is currently in the Environmental Document & Project Approval stage, which is anticipated to be complete by June 2023.
I-680 Ramp Metering	Caltrans	State Highway Operation and Protection Program project to install ramp metering equipment and ramp improvements along I-680 from I-580 through Contra Costa.	**Proposed.** The project is currently in final design. Construction completion is currently anticipated for 2028.
Northbound State Route 242 Rehabilitation Project Concord,	Caltrans	Caltrans District 4 will replace 3,500 linear feet of concrete paving in both lanes 2 and 3 of northbound SR-242 in Concord.	**Completed.** Construction for the project was completed in July 2021.
State Route 4 Operational Improvements: Interstate 680 to Bailey Road	Caltrans	The SR-4 Operation Improvements Project includes a continuation of a High-Occupancy Vehicle (HOV) lane on eastbound	**Proposed.** Project Study Report/Project Development Support was approved in May 2017. The project is in the Project Approval &

Name	Jurisdiction	Description of Project	Status
		SR-4 from the Northbound I-680 on-ramp to the start of the existing HOV lane just east of SR-242, as well as the addition of several sections of mixed flow lanes on eastbound and westbound SR-4 between SR-242 and Bailey Road. The project will be constructed in two phases.	Environmental Document Phase. However, the project is currently on hold until next steps to address SB 743 are determined.
Iron Horse Trail Pedestrian Overcrossing Project	East Bay Regional Park District, Contra Costa County	The City of San Ramon, in cooperation with Contra Costa Transportation Authority (CCTA) and Caltrans, constructed a pedestrian and cyclist overcrossing along the existing Iron Horse Trail alignment at Bollinger Canyon Road. The project will improve safety and air quality by reducing at-grade crossing conflicts between pedestrians, cyclists, and motorists and improve motor vehicle traffic by reducing idling at the intersection. The overcrossing consists of a cable-stayed main span with a central support and removed the left turn lane on the side of Bollinger Canyon Road where the trail crossing is located.	**Completed.** The Iron Horse Trail Bicycle and Pedestrian Overcrossing at Bollinger Canyon Road officially opened to the public on Saturday, July 19, 2025.

Sources: (City of Concord, 2023); (City of Martinez, 2023); (City of Pleasant Hill, 2023); (City of Walnut Creek, 2023b); (Town of Danville, 2023); (City of San Ramon, 2022); (City of San Ramon, 2025); (Contra Costa County , 2023); (Contra Costa Transportation Authority, 2023); (Governor's Office of Planning and Research, 2023); (Association of Bay Area Governments and Metropolitan Transportation Commission, 2013); (Central Contra Costa Transit Authority, 2016); (Transportation Partnership and Cooperation, 2017);(Contra Costa Transportation Authority, 2017); City of Concord Letter (June 24, 2024, Comment A-06 [Appendix G, *Comment Letters and Responses*])

Notes: BART = Bay Area Rapid Transit; I-680 = Interstate 680; MTC = Metropolitan Transportation Commission; SR = State Route

[1.] The former Concord Naval Weapons Station is outside the Community Impact Study Area. The City of Concord is looking to potentially redevelop a portion of the site, referred to as “Concord Community Reuse Project.” East Bay Regional Park District is also planning to create a new park on the site, called “Thurgood Marshall Regional Park – Home of the Port Chicago 50.”

2.1.1.2 Environmental Consequences

No-Build Alternative

The No-Build Alternative would maintain the current configurations of I-680 in the Community Impact Study Area. Under the No-Build Alternative, the proposed Project would not be constructed, and no impacts on land use would occur.

Build Alternatives (Alternatives 1C, 2, 3, and 5)

The Project Study Limits are located in incorporated cities and unincorporated communities, and the Project would not open new areas to development or lead to changes in density. This analysis evaluates existing land uses that would be converted to transportation uses for I-680 in the Community Impact Study Area. The analysis is based on the most current General Plan Land Use maps available from each jurisdiction.

Most of the proposed Project improvements would occur within State right-of-way (ROW). Table 2.1.1-3 identifies the potential ROW acquisitions that may be needed for each Build Alternative based on the final Project design. None of the Build Alternatives would require the full acquisition of any parcel; thus, no permanent or temporary residential or business relocations or displacements would occur as a result of the Project under the Build Alternatives. However, all Build Alternatives would require permanent partial acquisitions and temporary construction easements (TCE), consisting of narrow slivers of ROW, from publicly owned parcels along I-680. In addition, Alternatives 1C and 3 would require a TCE and permanent easements from private parcels (partial acquisition). Alternatives 2 and 5 would not require a TCE or permanent easements from private parcels. All permanent ROW acquisitions would occur in Walnut Creek.

TCEs would not result in a change in land use or zoning, because only a limited work area would be required for a limited period of time at any one location. Following completion of construction, TCE parcels would be restored to a condition as good or better than pre-project conditions. Construction would have no effect on the current zoning and land use designations of the TCE parcels or affect future land use or zoning. Because the affected parcels would be restored, no permanent change to any land use would result.

All permanent acquisitions (i.e., permanent easement or partial acquisition) would not affect the land use designation or zoning for the remainder of the properties. In addition, indirect impacts (e.g., changes in regional development and growth-related changes) to land use patterns are not anticipated with implementation of the Build Alternatives because impacts would be largely contained within existing ROW. All Build Alternatives have been designed to avoid impacts to existing built land uses, to the extent practicable, while adhering to design and operational criteria to maintain a safe roadway. During final design, efforts would be undertaken to further minimize construction and operation impacts to existing and planned land uses. Therefore, the

Build Alternatives would not result in major changes to the land use or zoning of any parcels in the Community Impact Study Area.

The proposed Project is compatible with the existing pattern of land use and development in the Community Impact Study Area. Proposed Project elements are consistent with adopted land use plans, policies, and regulations of the applicable local and regional jurisdictions. Therefore, the proposed Project would not result in any temporary or permanent adverse direct or indirect impacts related to land use, and no avoidance, minimization, or mitigation measures are required.

2.1.1.3 Summary

Alternative 2 has been selected as the preferred alternative. As described above, Alternative 2 would not result in adverse impacts on land use. No avoidance, minimization, or mitigation is required.

2.1.1.4 Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, or mitigation is required.

Table 2.1.1-3. Potential Right-of-Way Acquisitions by Build Alternative

Location		Property Info							Right-of-Way [a] (Square feet)		
PM	NB/ SB	Alt [b]	Owner	Address	City	Type	APN	Land Use	TCE	Permanent Easement	Partial Acquisition
12.7	NB	1C, 2, & 3	City of Walnut Creek. FC District	Rudgear Road	Walnut Creek	Local Road, Flood Channel	-	-	15,083	-	1,004
14.1	SB	1C & 3	Private	1236 Clover Lane	Walnut Creek	Parcel	184-033-008	SFM	813	-	-
14.1	SB	1C & 3	City of Walnut Creek	Clover Lane	Walnut Creek	Local Road	-	-	258	-	-
14.3	SB	1C & 3	Central Contra Costa Sanitary District	1250 Springbrook Road	Walnut Creek	Parcel	177-270-030	PU	715	1,772	88
14.4	NB	1C & 3	BART	Oakvale Road	Walnut Creek	Parcel	177-260-017	PU	-	26,378	1,225
14.6	NB	1C & 3	Private	1666 Terrace Road	Walnut Creek	Parcel	177-240-022	MFL	-	503	-
14.6	NB	1C & 3	Private	Vista Hermosa	Walnut Creek	Parcel	177-340-034	MFL	-	695	-
15.7	NB	2, 3, & 5	City of Walnut Creek	511 Lawrence Way	Walnut Creek	Parcel	173-014-005	MU-D	6,780	-	13,631
16	NB	2, 3, & 5	BART, FC District	Jones Road	Walnut Creek	BART ROW, Flood Channel	-	-	9,687	-	6,457
R18.2	NB	1C, 2, & 3	City of Pleasant Hill	Sherman Drive	Pleasant Hill	Local Road	-	SFHD	2,354	-	-

Sources: (HDR Engineering, Inc., 2023); (City of Walnut Creek, 2023a); (City of Pleasant Hill, 2022)
Notes: Alt = Alternative, APN = Assessor Parcel Number, AS-CM = Automobile Sales/Service and Custom Manufacturing District, BART = Bay Area Rapid Transit, FC District = Contra Costa County Flood Control and Water Conservation District, MFL = multiple-family low; MU-D = Mixed Use Downtown; NB = northbound, N/A = Not Applicable, PM = post mile, PU = Public/Semi Public, ROW = right-of-way, SFM = single-family medium, SB = southbound, SFHD = Single Family High Density, TCE = temporary construction easement
[a] ROW estimates are preliminary and subject to final design and negotiations with landowners.
[b] Alternative 2 is the preferred alternative.

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2.1.2 Consistency with State, Regional, and Local Plans and Programs

2.1.2.1 Affected Environment

This following discussion is based on the proposed Project's *Community Impact Assessment* (HDR Engineering, Inc. 2023), which was completed in November 2023. This section addresses the proposed Project's consistency with applicable adopted transportation and land use plans and programs.

The Community Impact Study Area, as shown in Figure 2.1.1-1 of Section 2.1.1, *Existing and Future Land Use*, was used to assess land use plan and program regulatory consistency within the proposed Project's selected geographic boundary.

State Programs

California Scenic Highway Program

The California Department of Transportation (Caltrans) manages the California Scenic Highway Program, which aims to protect and enhance the natural scenic beauty of California highways and adjacent corridors through special conservation treatments (California Department of Transportation, 2023b). The California Scenic Highway System includes a list of highways that are either eligible for designation as State scenic highways or have been officially designated. These highways are identified in Section 263 of the Streets and Highways Code and can be found under the Scenic Highway System List (California Department of Transportation, 2023b). Interstate 680 (I-680) is an Officially Designated State Scenic Highway between State Route (SR) 24 in Walnut Creek and Mission Boulevard in Fremont.

Classified Landscaped Freeways Program

Caltrans manages the Classified Landscaped Freeways Program. A classified landscaped freeway is a section of freeway with ornamental vegetation planting that meets the criteria established by the California Code of Regulations, Outdoor Advertising Regulations, Title 4, Division 6. This designation is used in the control and regulation of outdoor advertising displays (California Department of Transportation, 2023a). Sections of I-680 in Contra Costa County between the following post miles (PM) are Classified Landscaped Freeway, which primarily assists in the regulation of outdoor advertising placement:

- PM R3.90 to 9.05
- PM R9.22 to R12.05
- PM R12.16 to 20.54
- PM 21.19 to 21.71

- PM 22.48 to 22.81
- PM 24.47 to 24.95
- PM 24.55 to 25.01

Regional Plans and Programs

Transportation Improvement Program

The Metropolitan Transportation Commission's (MTC) Transportation Improvement Plan (TIP) lists the near-term transportation projects, programs, and investment priorities of the region's surface transportation system that have a federal interest, along with locally and State-funded projects that are regionally significant (Metropolitan Transportation Commission, 2022). The TIP signifies the start of implementation for the programs and policies approved in the Bay Area's Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), *Plan Bay Area 2050*. It does this by identifying specific projects over a 4-year timeframe that would help move the region toward its transportation vision.

The proposed Project is included in the 2025 TIP as Project ID CC-170017. The State approved the 2025 Federal Statewide Transportation Improvement Program (FSTIP) on November 15, 2024. The Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) approved the FSTIP in December 2024. The Project is currently described in the 2025 TIP as follows:

> *Contra Costa County : I680 NB from Livorna Rd to Arthur Rd : 1) From Livorna Rd to SR-242: Extend Managed Lane; 2) From SR-242 to Arthur Rd: Convert Existing HOV Lane to Express Lane; 3) From N Main St to Treat Blvd: operational improvements; and 4) Various locations along NB I-680: Install limited access buffers.*

Plan Bay Area 2050

The proposed Project is included in the Association of Bay Area Governments' (ABAG) and MTC's *Plan Bay Area 2050*, the RTP/SCS for the nine-county San Francisco Bay Area (Association of Bay Area Governments and Metropolitan Transportation Commission, 2021). *Plan Bay Area 2050* was adopted on October 21, 2021. The proposed Project is an element of the Express Lanes Regional Program (21-T12-116).

Plan Bay Area 2050 provides the following description for this program:

> *This program includes funding to implement express lanes through HOV lane conversions on I-80 (ALA, CC), I-280 (SCL), I-680 (CC), I-880 (SCL), US-101 (SCL), SR-4 (CC), SR-84 (ALA), SR-85 (SCL), SR-87 (SCL), and SR-92 (ALA); partial HOV lane conversions on I-80 (SOL), I-280 (SF), I-680 (CC), and US-101 (SF); freeway lane conversions on I-80 (SOL), I-280 (SCL), I-580 (ALA), I-680 (SCL), and I-880 (ALA); new lanes on I-80 (SOL), I-680 (ALA, CC), I-880 (ALA),*

and US-101 (SM); new dual lanes with HOV lane conversions on SR-85 (SCL); and new dual lanes on US-101 (SCL).

Connecting the Bay Area: Express Lanes Network 2021 Strategic Plan

Connecting the Bay Area: Express Lanes Network 2021 Strategic Plan describes how MTC seeks to implement a system of managed lanes in the San Francisco Bay Area that is not only cost-effective and self-supporting, but also helps achieve the regional goals of reducing greenhouse gas emissions, supporting transit priority, promoting use of transit and other high-occupancy modes, and advancing equity throughout the region in accordance with *Plan Bay Area 2050* and MTC's Equity Platform (Metropolitan Transportation Commission, 2021). The proposed Project is identified in the network recommendation partly as a new construction and a high-occupancy vehicle (HOV) conversion and is selected for inclusion in *Plan Bay Area 2050*.

County Plans

2017 Countywide Transportation Plan

As the designated congestion management agency for Contra Costa County, the Contra Costa Transportation Authority (CCTA) is required to adopt, and update periodically, a Countywide Transportation Plan (CTP) that serves as a long-range plan of at least 20 years into the future with specific details regarding the strategies and investments to maintain, manage, and improve the region's transportation network (Contra Costa Transportation Authority, 2017). CCTA adopted its first CTP in 1995. The first major update occurred in 2000, and a comprehensive update tied to the sales tax renewal was adopted in 2004. In 2009, as Measure J began to go into effect, the 2009 CTP, the third major update, was adopted. The 2017 CTP represents the fourth and most recent major update to the plan. The CTP provides the overall direction and a coordinated approach for achieving and maintaining a balanced and functional transportation system within Contra Costa with goals, strategies, and specific projects and other actions for achieving CCTA's vision for Contra Costa and its transportation system.

Measure J Expenditure Plan and 2022 Strategic Plan

Measure J provides for the continuation of Contra Costa County's half-cent transportation sales tax from April 2009 through March 31, 2034. CCTA worked for over 2 years, along with local governments, organizations, and residents, to develop the *Measure J Expenditure Plan*, which specifies how the funds will be spent (Contra Costa Transportation Authority, 2011). The Expenditure Plan, which received the support of every Contra Costa city and town, as well as the County Board of Supervisors, includes funding for I-680 Carpool Lane Gap Closure/Transit Corridor Improvements. Strategic plans are developed every 2 years with the latest being the *2022 Measure J Strategic Plan* (Contra Costa Transportation Authority, 2022). The proposed Project is project number 8009.02 in the *2022 Measure J Strategic Plan* and is identified as Strategy

Number 2 for the INNOVATE 680 Program. CCTA provides the following scope for the proposed Project in the *2022 Measure J Strategic Plan*:

> *Eliminate the gap in existing carpool lanes in the Northbound (NB) direction and convert to an express lane to increase efficiency.*

Measure J also contains a Growth Management Program that is designed to help Contra Costa County plan for and accommodate the continued increases in population, households, and jobs that are expected to occur within the County through the year 2035 (Contra Costa Transportation Authority, 2021).

Central County Action Plan for Routes of Regional Significance

The Central County Action Plan for Routes of Regional Significance (Central County Action Plan) was adopted by the Transportation Partnership and Cooperation (TRANSPAC) on September 20, 2017, and addresses the key transportation issues that Central County will face by 2040 (Transportation Partnership and Cooperation, 2017). TRANSPAC is composed of representatives from the Cities of Walnut Creek, Pleasant Hill, Clayton, Concord, Martinez, and unincorporated areas of Contra Costa County. The Central County Action Plan identified the completion of HOV lanes on I-680 as a major priority. The new Central County Action Plan is currently being drafted. As of March 2023, the draft Central County Action Plan has been reviewed and accepted by the Regional Transportation Planning Agencies in the County and forwarded to CCTA for acceptance and inclusion in the draft CTP.

Tri-Valley Transportation Plan and Action Plan for Routes of Regional Significance

The Tri-Valley Transportation Plan and Action Plan for Routes of Regional Significance (TVTC Action Plan) was adopted by the Tri-Valley Transportation Council (TVTC) in September 2017 and addresses the key transportation issues that the Tri-Valley area will face by 2040 (Tri-Valley Transportation Council, 2017). TVTC is made up of the cities of Dublin, Livermore, Pleasanton, and San Ramon; the Town of Danville; and Alameda and Contra Costa Counties. The TVTC Action Plan identified the need to add HOV and Express Lanes to I-680 to reduce travel times for rideshares and transit patrons and to enhance mobility during off-peak hours. The new TVTC Action Plan is currently being drafted. As of March 2023, the draft TVTC Action Plan has been reviewed and accepted by the Regional Transportation Planning Agencies in the County and forwarded to CCTA for acceptance and inclusion in the draft CTP.

Contra Costa County General Plan

The *Contra Costa County General Plan* was last adopted in 2005 and, as of March 2023, is in the process of being updated to be the *Contra Costa County General Plan 2040* (Contra Costa County, 2023). The Transportation Element's Draft Goals, Policies, and Actions include several policies specifically aimed at support for HOV/High-occupancy Toll (HOT) lanes, or express lanes. The strategy to implement HOV lanes is discussed as part of the Plan's Transportation Element.

Local Plans

City of Martinez General Plan 2035

On November 2, 2022, the City of Martinez adopted the *2035 General Plan*, superseding the *1973 General Plan*. The Martinez *2035 General Plan* contains a set of public goals and policies to guide the future development and maintenance of the physical environment in Martinez. The plan has identified several goals and policies in the Circulation Element and the Growth Management Element related to the improvement of streets and highway circulation in Martinez (City of Martinez, 2023).

City of Concord 2030 General Plan

The *Concord 2030 General Plan* was adopted in October 2007 and amended in November 2010, January 2012, and July 2012 and includes several policies aimed at improving transportation in Concord (City of Concord, 2012). The Transportation and Circulation Element and the Growth Management Element have policies that support the proposed Project.

City of Pleasant Hill General Plan

The *Pleasant Hill General Plan* was adopted in July 2003, and the Circulation Element was last amended in April 2015 (City of Pleasant Hill, 2015). The City is currently undergoing a General Plan update that will address the issues facing the City up to 2040. Several goals and policies in the Circulation Element and Growth Management Element are related to the proposed Project.

City of Walnut Creek 2025 General Plan

Walnut Creek's *2025 General Plan* was originally adopted in 2006 and most recently amended on October 13, 2020 (City of Walnut Creek, 2020). The plan's Transportation Element includes several policies aimed at improving transportation in the city.

City of Lafayette General Plan

Lafayette's *General Plan* was adopted on October 28, 2002, and most recently amended on November 13, 2012 (City of Lafayette, 2012). The plan's Circulation Element includes goals, policies, and programs related to the proposed Project.

Town of Danville 2030 General Plan

The *Town of Danville 2030 General Plan* was adopted on March 19, 2013, and the plan's Mobility Element includes several policies aimed at improving transportation in Danville (Town of Danville, 2013).

City of San Ramon General Plan 2035

The *City of San Ramon General Plan 2035* articulates a long-term vision for the City. The plan was adopted on April 28, 2015, and the latest amendment was effective October 2019 (City of San Ramon, 2019). There are several guiding policies and implementing policies in the Traffic and Circulation Element, as well as in the Growth Management Element, that relate to the proposed Project.

Contra Costa Countywide Bicycle and Pedestrian Plan

The proposed improvements along northbound I-680 would coincide with several existing and proposed bicycle and pedestrian facilities, including the Iron Horse Regional Trail and the Contra Costa Canal Trail/Briones to Mount Diablo Regional Trail. CCTA adopted the Contra Costa Countywide Bicycle and Pedestrian Plan (CBPP) in July 2018 to support and encourage walking and bicycling in the County (Contra Costa Transportation Authority, 2018). The CBPP builds on and expands the CTP's goals, policies, and strategies.

East Bay Regional Park District Master Plan 2013

The *East Bay Regional Park District (EBRPD) Master Plan 2013* (EBRPD Master Plan) defines the EBRPD's overall mission and vision (East Bay Regional Park District, 2013). The EBRPD Board of Directors approved the *EBRPD Master Plan* on July 16, 2013. The *EBRPD Master Plan* contains policies and descriptions of the programs in-place regarding resource conservation, management, interpretation, public access, and recreation. The policies contained in the *EBRPD Master Plan* guide the stewardship and development of the parks. The goal is to maintain a careful balance between the need to protect and conserve resources and the need to provide opportunities for recreational use of the parklands, both in the present and in the future.

2.1.2.2 Environmental Consequences

Table 2.1.2-1 summarizes the consistency of the No-Build and Build Alternatives with applicable plans and policies.

No-Build Alternative

The No-Build Alternative would maintain the current configurations of I-680 in the Study Area. Under the No-Build Alternative, the proposed Project would not be constructed, and no impacts on consistency with State, regional, and local plans and programs would occur. The No-Build Alternative would be inconsistent with various goals and policies from adopted plans as identified in Table 2.1.2-1. Therefore, temporary or permanent adverse direct or indirect impacts would occur under the No-Build Alternative.

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

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
California Scenic Highway Program					
Goal: The goal of the California Scenic Highway Program is to preserve and enhance the natural beauty of California.	**Not Applicable.** The No-Build Alternative would not result in any changes to existing conditions. Therefore, this goal would not be applicable.	**Consistent.** As discussed in Section 2.1.9, *Visual/Aesthetics*, I-680 is an Officially Designated State Scenic Highway between SR-24 in Walnut Creek and Mission Boulevard in Fremont. The proposed Project under all Build Alternatives would not directly impact distant scenic resources but would directly impact vegetation adjacent to the highway. However, as discussed in Section 1.4.1.6, *Standardized Project Measures*, of this EIR/EA, replacement planting would occur in areas where planting is removed by construction activities.	**Consistent.** Alternative 2 would be the same as Alternative 1C.	**Consistent.** Alternative 3 would be the same as Alternative 1C.	**Consistent.** Alternative 5 would be the same as Alternative 1C.
Classified Landscaped Freeways Program					
Goal: The goal of the Classified Landscaped Freeways designation is to control and	**Not Applicable.** The No-Build Alternative would not result in any changes to	**Consistent.** As discussed in Section 2.1.9, *Visual/Aesthetics*, sections of I-680 are Classified Landscaped Freeway in	**Consistent.** Alternative 2 would be the same as Alternative 1C.	**Consistent.** Alternative 3 would be the same as Alternative 1C.	**Consistent.** Alternative 5 would be the same as Alternative 1C.

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
regulate outdoor advertising displays.	existing conditions. Therefore, this goal would not be applicable.	Contra Costa County. There are two locations in Walnut Creek where the proposed Project under all Build Alternatives would remove vegetation at the edge of the highway that are within zones classified as Landscaped Freeways. In general, the loss of Classified Landscaped Freeway would be high. However, the City of Walnut Creek prohibits billboards within the city limits. Further, as discussed in Section 1.4.1.6, *Standardized Project Measures*, of this EIR/EA, replacement planting would occur in areas where planting is removed by construction activities.			
Transportation Improvement Plan					
Policy Guideline: Each project in MTC's TIP submitted to Caltrans must be consistent with and reflect investment priorities established in the most recently adopted metropolitan	**Inconsistent.** The No-Build Alternative would not result in any changes to existing conditions and would not implement the	**Consistent.** The proposed Project was identified in the 2023 TIP and 2025 TIP as Project ID CC-170017. The design concept in the TIP was revised following selection of Alternative 2 as the preferred alternative to include braided ramps.	**Consistent.** Alternative 2 is consistent with the design concept and timely implementation of the Project as reflected in the	**Consistent.** Alternative 3 would be the same as Alternative 2.	**Consistent.** Alternative 5 converts general-purpose lanes to express lanes without widening. CCTA and MTC would work to update the TIP

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
transportation plan, in accordance with MAP-21. Each TIP project must show consistency with the project's design concept, and timely implementation as reflected in the adopted RTP/SCS.	project as reflected in MTC's 2023 TIP or *Plan Bay Area 2050*.		2025 TIP and *Plan Bay Area 2050*.		should this alternative be selected. Alternative 5 will be consistent with the TIP once updated.
Plan Bay Area 2050					
Build a Next-Generation Transit Network – T12. Build an integrated regional express lanes and express bus network. Complete the buildout of the regional express lanes network to provide uncongested freeway lanes for new and improved express bus services, carpools and toll-paying solo drivers.	**Inconsistent.** Because the No-Build Alternative would not result in any changes to existing conditions, this alternative would not achieve the transportation improvements projected to result under the Build Alternatives and would be inconsistent with this goal.	**Consistent.** Alternative 1C is consistent with Express Lanes Regional Program (21 T12-116) design concept and implementation stated in *Plan Bay Area 2050* because it would implement express lanes through HOV conversion and new lanes in Contra Costa County. Alternative 1C would close a 7.5-mile gap in managed lanes on northbound I-680 and directly contribute to the buildout of the regional express lanes network.	**Consistent.** Alternative 2 would contribute to the build out of the express lanes in the region. Although a 2-mile gap would remain at the SR-24 Interchange, Alternative 2 would reduce the gap in manage lanes on northbound I-680.	**Consistent.** Alternative 3 would be the same as Alternatives 1C and 2.	**Consistent.** Alternative 5 would be similar to Alternative 2. However, Alternative 5 would convert general-purpose lanes to express lanes without a new lane. As described above, CCTA and MTC would update the TIP should this alternative be selected.

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
Connecting the Bay Area: Express Lanes Network 2021 Strategic Plan					
Goal: Manage congestion and bring reliability to the traveling public.	**Inconsistent.** Because the No-Build Alternative would not result in any changes to existing conditions, this alternative would not achieve the transportation improvements projected to result under the Build Alternatives and would be inconsistent with this goal.	**Consistent.** Alternative 1C would reduce congestion on northbound I-680 and bring reliability to the traveling public as described in Section 2.1.8, *Traffic and Transportation/Pedestrian and Bicycle Facilities*.	**Consistent.** Alternative 2 would be the same as Alternative 1C.	**Consistent.** Alternative 3 would be the same as Alternative 1C.	**Consistent.** Alternative 5 would be the same as Alternative 1C.
Goal: Increase person throughput by creating a seamless network that incentivizes the use of transit, vanpools, and carpools.	**Inconsistent.** Because the No-Build Alternative would not result in any changes to existing conditions, this alternative would not achieve the transportation improvements projected to result under the	**Consistent.** Alternative 1C would increase person throughput along northbound I-680 compared to the No-Build Alternative by design year (2047) (DKS Associates, 2023). All eligible vehicles, including HOVs and buses, would be able to use express lanes, thereby encouraging the use of transit, vanpools, and carpools.	**Consistent.** Alternative 2 would be similar to Alternative 1C.	**Consistent.** Alternative 3 would be similar to Alternative 1C.	**Somewhat Consistent.** Alternative 5 would reduce person throughput on northbound I-680 compared to the No-Build Alternative in the morning peak period. However, Alternative 5 would increase person

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
	Build Alternatives and would be inconsistent with this goal.				throughput in the afternoon peak period and encourage the use of transit and HOV vehicles.
Goal: Minimize greenhouse gas emissions.	**Inconsistent.** Because the No-Build Alternative would not result in any changes to existing conditions, this alternative would not achieve the transportation improvements projected to result under the Build Alternatives and would be inconsistent with this goal.	**Consistent.** Alternative 1C would improve traffic flow and decrease congestion along I-680, thus reducing greenhouse gas emissions from stop-and-go traffic. Further, Alternative 1C would add and improve HOV and Express Lane travel options along northbound I-680. All eligible vehicles, including HOVs and buses, would be able to use express lanes, thereby incentivizing the use of transit, vanpools, clean air vehicles, and carpools. This would also reduce overall automobile use and minimize automobile-related greenhouse gas emissions. Therefore, Alternative 1C would be consistent with this goal.	**Consistent.** Alternative 2 would be the same as Alternative 1C.	**Consistent.** Alternative 3 would be the same as Alternative 1C.	**Consistent.** Alternative 5 would be the same as Alternative 1C.
Goal: Focus on equity to improve	**Not Applicable.** The No-Build	**Consistent.** Alternative 1C would address existing	**Consistent.** Alternative 2 would	**Consistent.** Alternative 3 would	**Consistent.** Alternative 5 would

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
transportation access and affordability, especially for Communities of Concern	Alternative would not result in any changes to existing conditions. Therefore, this goal would not be applicable.	transportation problems along northbound I-680 regarding congestion, system continuity, and operational improvements. The benefits of the proposed Project under Alternative 1C would be realized by all users. The Project includes a public engagement program that incorporates plain, simple language, and information is translated into non-English languages, as per CCTA's Limited English Proficiency (LEP) Program.	be the same as Alternative 1C.	be the same as Alternative 1C.	be the same as Alternative 1C.
Goal: Deliver Bay Area Express Lanes Network in a timely manner.	**Inconsistent.** Because the No-Build Alternative would not result in any changes to existing conditions, this alternative would not achieve the transportation improvements projected to result under the Build Alternatives and would be	**Consistent.** By closing the gap in express lanes, Alternative 1C would deliver the Bay Area Express Lanes Network in a timely manner and be consistent with this goal.	**Consistent.** Alternative 2 would be the same as Alternative 1C, except it reduces the gap in managed lanes.	**Consistent.** Alternative 3 would be the same as Alternative 1C.	**Consistent.** Alternative 5 would be the same as Alternative 2.

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
	inconsistent with this goal.				
Goal: Be responsible in the use of public funds.	**Not Applicable.** The No-Build Alternative would not result in any changes to existing conditions. Therefore, this goal would not be applicable.	**Consistent.** The proposed Project is identified in the 2023 TIP as Project ID CC-170017 and ABAG and MTC's *Plan Bay Area 2050* as Project ID 21-T12-116. The proposed Project is consistent with the design concept and timely implementation as reflected in ABAG and MTC's adopted *Plan Bay Area 2050*. Further, the proposed Project under Alternative 1C would address existing transportation problems along northbound I-680 regarding congestion,	**Consistent.** Alternative 2 would be the same as Alternative 1C.	**Consistent.** Alternative 3 would be the same as Alternative 1C.	**Consistent.** Alternative 5 would be the same as Alternative 1C.

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
		system continuity, and operational improvements. Therefore, Alternative 1C would result in the responsible use of public funds.			
2017 Countywide Transportation Plan					
Goal 1: Support the efficient, safe, and reliable movement of people and goods using all available travel modes. **Strategy 1.1:** Increase the efficiency of highways and arterial roads through capital investment, operational enhancements, and use of technology. This will include funding for capital projects that will increase efficiency on highways and roadways, such as by interchange improvements to reduce weaving and congestion at the I-680 and SR-4 interchange,	**Inconsistent.** Because the No-Build Alternative would not result in any changes to existing conditions, this alternative would not achieve the transportation improvements projected to result under the Build Alternatives and would be inconsistent with this goal and these strategies.	**Consistent.** Alternative 1C would eliminate the gap in managed lanes on I-680. Alternative 1C would add and improve HOV and express lane travel options along northbound I-680. All eligible vehicles, including HOVs and buses, would be able to use express lanes, thereby incentivizing the use of transit, vanpools, and carpools. These improvements would improve traffic flow and decrease congestion along I-680. Further, coordination is ongoing between the multiple regional and local government agencies involved in the proposed Project to improve traffic conditions on I-680	**Consistent.** Alternative 2 would be the similar to Alternative 1C. However, Alternative 2 would reduce but not eliminate the gap in managed lanes.	**Consistent.** Alternative 3 would be the same as Alternative 1C.	**Consistent.** Alternative 5 would be the same as Alternative 2.

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
and operational improvements proposed by the INNOVATE 680 project for transit investment and congestion relief through enhanced bus service and use of technology to support connected and autonomous vehicles.		throughout the jurisdictions located in the Project Study Limits, consistent with the INNOVATE 680 Program. Therefore, Alternative 1C would support the efficient, safe, and reliable movement of people and goods using all available travel modes, including HOVs, non-carpool drivers, and transit.			
Strategy 1.2: Engage in partnerships with jurisdictions, stakeholders, and other agencies to identify and implement strategies for managing congestion and increasing multimodal mobility. […] In the future, the Authority will continue to engage with our partners and a diverse group of stakeholders to […][expand] express lanes on I-680 and elsewhere.					
Strategy 1.3: Eliminate gaps in the existing					

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
highway, arterial, and trails systems, especially those in the regional HOV lane and express lane network. […] Plans to eliminate I-680 gaps are well underway; I-680 express lanes in the northbound direction are about to open, and engineering for southbound express lanes is under way.					
Strategy 1.4: Improve the highway and arterial system to influence the location and nature of anticipated growth in accordance with the General Plans of local jurisdictions and consistent with the Authority's adopted CTP.					

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
Goal 2: Manage growth to sustain Contra Costa's economy, preserve its environment and support its communities. **Strategy 2.1:** Continue to require cooperative transportation and land use planning among Contra Costa County, cities, towns, and transportation agencies.	**Inconsistent.** Based on future projections on traffic demands and growth, the No-Build Alternative would result in further deterioration and result in increased congestion, vehicle delays, safety concerns, vehicle operating costs, and vehicle emissions. The No-Build Alternative would be inconsistent with this goal and strategy.	**Consistent.** Alternative 1C includes capacity enhancements along northbound I-680 that are intended to respond to expected demand and growth for the region and to improve current operations. Alternative 1C would not induce growth. The Project has been developed cooperatively with local jurisdictions within Contra Costa County.	**Consistent.** Alternative 2 would be the same as Alternative 1C.	**Consistent.** Alternative 3 would be the same as Alternative 1C.	**Consistent.** Alternative 5 would be the same as Alternative 1C.
Goal 3: Expand safe, convenient and affordable alternatives to the single-occupant vehicle. **Strategy 3.5:** Promote the formation of more carpools and vanpools,	**Inconsistent.** Because the No-Build Alternative would not result in any changes to existing conditions, this alternative would not achieve the	**Consistent.** Alternative 1C would encourage HOV and transit service use on northbound I-680.	**Consistent.** Alternative 2 would be the same as Alternative 1C.	**Consistent.** Alternative 3 would be the same as Alternative 1C.	**Consistent.** Alternative 5 would be the same as Alternative 1C.

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
and greater use of transit, bicycling, and walking.	transportation improvements projected to result under the Build Alternatives and would be inconsistent with this goal and strategy.				
Measure J					
Goal: Support the construction and improvement of state highways, the construction, maintenance, improvement, and operation of local streets, roads, and highways, and the construction, improvement, and operation of public transit systems, including paratransit services, and for specific efforts supporting such investments.	**Inconsistent.** Because the No-Build Alternative would not result in any changes to existing conditions, this alternative would not achieve the transportation improvements projected to result under the Build Alternatives and would be inconsistent with this goal.	**Consistent.** The proposed Project under all Build Alternatives is included in the Measure J Expenditure Plan and 2022 Strategic Plan and would support the improvement of northbound I-680 within the Community Impact Study Area.	**Consistent.** Alternative 2 would be the same as Alternative 1C.	**Consistent.** Alternative 3 would be the same as Alternative 1C.	**Consistent.** Alternative 5 would be the same as Alternative 1C.

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
Central County Action Plan for Routes of Regional Significance					
Goal 2: Support the enhancement and expansion of an efficient transit system, **Action 2-B:** Support the efforts of CCTA to evaluate congestion relief strategies along the I-680 corridor, including transit options and new technologies.	**Inconsistent.** Because the No-Build Alternative would not result in any changes to existing conditions, this alternative would not achieve the transportation improvements projected to result under the Build Alternatives and would be inconsistent with this goal and action.	**Consistent.** Alternative 1C would add and improve express lane travel options along northbound I-680. A purpose of the proposed Project is to relieve congestion along the I-680 corridor. All eligible vehicles, including buses, would be able to use express lanes, thereby supporting the enhancement of a more efficient transit system. Further, the proposed Project under Alternative 1C is part of the INNOVATE 680 Program.	**Consistent.** Alternative 2 would be the same as Alternative 1C.	**Consistent.** Alternative 3 would be the same as Alternative 1C.	**Consistent.** Alternative 5 would be the same as Alternative 1C.
Goal 8: Work to improve freeway flow. **Action 8-A:** Continue to monitor and evaluate operational improvements at freeway interchanges on I-680, SR-242, SR-24, and SR-4	**Inconsistent.** Because the No-Build Alternative would not result in any changes to existing conditions, this alternative would not achieve the transportation improvements projected to	**Consistent.** Alternative 1C would address existing transportation problems along northbound I-680 regarding congestion, system continuity, and operational improvements. Alternative 1C would reduce peak-period congestion and delay on northbound I-680. This alternative would also reduce travel time and improve travel	**Consistent.** Alternative 2 would be the same as Alternative 1C.	**Consistent.** Alternative 3 would be the same as Alternative 1C.	**Consistent.** Alternative 5 would be the same as Alternative 1C, except Alternative 5, would only reduce peak-period congestion and delay on northbound I-680 in

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
	result under the Build Alternatives and would be inconsistent with this goal and action.	time reliability for travelers in the corridor. Therefore, Alternative 1C would improve freeway flow.			the afternoon peak period.
Goal 9: Support use of HOV and Express Lanes. **Action 9-A:** Support the completion of a continuous HOV system on I-680. **Action 9-B:** Support the connection of the SR-4 HOV system to I-680. **Action 9-C:** Support consistent occupancy requirements for toll-free HOV lanes on the Benicia-Martinez Bridge and I-680. **Action 9-D:** Support the implementation of express lanes on I-680, consistent with MTC's project.	**Inconsistent.** Because the No-Build Alternative would not result in any changes to existing conditions, this alternative would not achieve the transportation improvements projected to result under the Build Alternatives and would be inconsistent with this goal and these actions.	**Consistent.** Alternative 1C would add and improve HOV and express lane travel options along northbound I-680. All eligible vehicles, including HOVs and buses, would be able to use express lanes, thereby supporting the use of HOV and express lanes. Tolling pricing, enforcement, and signage would occur similar to existing express lanes on I-680.	**Consistent.** Alternative 2 would be the same as Alternative 1C.	**Consistent.** Alternative 3 would be the same as Alternative 1C.	**Consistent.** Alternative 5 would be the same as Alternative 1C.

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
Action 9-E: Support additional incentives for HOV users.					
Tri-Valley Transportation Plan and Action Plan for Routes of Regional Significance					
Goal 5: Maintain and actively pursue enhanced and expanded public transit service, ridesharing, and non-motorized mode options and trip reduction programs in order to increase accessibility, to increase the transit share of travel in the Tri-Valley, and to increase average vehicle occupancy.	**Inconsistent.** Because the No-Build Alternative would not result in any changes to existing conditions, this alternative would not achieve the transportation improvements projected to result under the Build Alternatives and would be inconsistent with this goal and these actions.	**Consistent.** Alternative 1C would eliminate the gap in managed lanes on I-680. Alternative 1C would add and improve HOV and express lane travel options along northbound I-680. All eligible vehicles, including HOVs and buses, would be able to use express lanes, thereby incentivizing the use of transit, vanpools, and carpools. These improvements would increase the transit share of travel in the Tri-Valley and increase average vehicle occupancy.	**Consistent.** Alternative 2 would be similar to Alternative 1C.	**Consistent.** Alternative 3 would be similar to Alternative 1C.	**Consistent.** Alternative 5 would be similar to Alternative 1C.
Contra Costa County General Plan					
Policy 1.4: Partner with the CCTA and Caltrans to better manage traffic operations on the State highway system in	**Not Applicable.** The No-Build Alternative would not result in any changes to existing	**Consistent.** Coordination is ongoing between the multiple regional and local government agencies involved in the proposed Project under Alternative 1C	**Consistent.** Alternative 2 would be the same as Alternative 1C.	**Consistent.** Alternative 3 would be the same as Alternative 1C.	**Consistent.** Alternative 5 would be the same as Alternative 1C.

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
Contra Costa through application of ramp metering, construction of HOV/express lanes, and other capacity-management techniques.	conditions. Therefore, this policy would not be applicable.	to improve traffic conditions on I-680 throughout the jurisdictions located in the Project Study Limits.			
City of Martinez General Plan 2035					
Goal 1: Encourage safe and convenient access to activities in the community and provide a well-designed local roadway system as well as pedestrian pathways and bicycle lanes. **Policy 1.3:** Provide efficient citywide automobile circulation by maintaining and, where necessary, improving local and regional roadway facilities.	**Inconsistent.** Because the No-Build Alternative would not result in any changes to existing conditions, this alternative would not achieve the transportation improvements projected to result under the Build Alternatives and would be inconsistent with this goal.	**Consistent.** Alternative 1C would reduce travel time and improve travel time reliability for travelers along northbound I-680. Alternative 1C would also encourage HOV and transit service use. Therefore, Alternative 1C would contribute to a safe and convenient roadway system and be consistent with this goal and policy.	**Consistent.** Alternative 2 would be the same as Alternative 1C.	**Consistent.** Alternative 3 would be the same as Alternative 1C.	**Consistent.** Alternative 5 would be the same as Alternative 1C.
Goal 2: Maintain and/or improve mobility in the city by considering alternative	**Inconsistent.** Because the No-Build Alternative would not result	**Consistent.** Coordination is ongoing between the multiple regional and local government agencies	**Consistent.** Alternative 2 would	**Consistent.** Alternative 3 would	**Consistent.** Alternative 5 would

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
circulation system improvements beyond those identified within Planned Major Improvements that increase system capacity and are found acceptable to the City, its residents, and where applicable, Caltrans or other agency.	in any changes to existing conditions, this alternative would not achieve the transportation improvements projected to result under the Build Alternatives and would be inconsistent with this goal and these implementation measures.	involved in the proposed Project under Alternative 1C, including with the City of Martinez, to improve traffic conditions on I-680 within the Project's PM limits.	be the same as Alternative 1C.	be the same as Alternative 1C.	be the same as Alternative 1C.
Implementation Measure 1C: As both city and regional travel increase transportation demand, work cooperatively with regional partner agencies including Caltrans, CCTA, ABAG, MTC, and others to plan and fund improvement projects that increase roadway capacity while maintaining or improving access to multi-modal facilities following the City's community and circulation priorities					

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
Implementation Measure 1F: Continue to work with Caltrans, CCTA, ABAG, MTC, County Connection, and the County to plan, design, fund, and construct programmed improvements to state highways and major regional roadways in a timely, context-sensitive manner.					
Goal 3: Participate in on-going multi-jurisdictional transportation planning programs, such as with other agencies, the Regional Transportation Planning Committee (RTPC) and CCTA that reflect the nature of the County's land use and circulation system by focusing on facilities that serve regional travel demand, in order to create a balanced, safe and efficient transportation system	**Not Applicable.** The No-Build Alternative would not result in any changes to existing conditions. Therefore, this goal and these policies would not be applicable.	**Consistent.** The proposed Project is identified in ABAG and MTC's *Plan Bay Area 2050* as Project ID 21-T12-116. The proposed Project is consistent with the design concept and timely implementation as reflected in ABAG and MTC's adopted *Plan Bay Area 2050*. Further, coordination is ongoing between the multiple regional and local government agencies involved in the proposed Project under Alternative 1C to improve traffic conditions on I-680 throughout the jurisdictions located adjacent to the	**Consistent.** Alternative 2 would be the same as Alternative 1C.	**Consistent.** Alternative 3 would be the same as Alternative 1C.	**Consistent.** Alternative 5 would be the same as Alternative 1C.

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
and to manage the impacts of growth.		Project Study Limits. Therefore, Alternative 1C would be consistent with the City of Martinez' goal and policies regarding participation with multi-jurisdictional transportation planning programs.			
Policy 1: Participate with TRANSPAC and CCTA in developing Action Plans to address problems on Routes of Regional Significance that have been designated by the City in cooperation with TRANSPAC and CCTA. In Martinez, these are: I-680, SR-4, Alhambra Avenue and Pacheco/Contra Costa Boulevard.					
Policy 2: Participate in multi-jurisdictional transportation planning by participating in TRANSPAC activities including development of Regional Route Action Plans and by cooperating in planning for intersections subject to Findings of Special Circumstances located in other jurisdictions, and					

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
CCTA's Countywide Comprehensive Transportation Plan and Planning Process (no longer required by CCTA but maintained by the City as long-term goals).					
City of Concord 2030 General Plan					
Goal 1: A Safe and Efficient Multi-Modal Transportation System. **Policy 1.3:** Maintain and upgrade transportation systems to provide smooth flow of traffic, minimize vehicle emissions, and save energy.	**Inconsistent.** Because the No-Build Alternative would not result in any changes to existing conditions, this alternative would not achieve the transportation improvements projected to result under the Build Alternatives and would be inconsistent with this goal.	**Consistent.** Alternative 1C would reduce travel time and improve travel time reliability for travelers along northbound I-680. Alternative 1C would also encourage HOV, clean air vehicle use, and transit service use as well as decrease congestion by improving traffic flow along I-680, thus reducing greenhouse gas emissions from stop-and-go traffic.	**Consistent.** Alternative 2 would be the same as Alternative 1C.	**Consistent.** Alternative 3 would be the same as Alternative 1C.	**Consistent.** Alternative 5 would be the same as Alternative 1C.
Goal 3: Minimize single-occupancy vehicle travel in Concord.	**Inconsistent.** Because the No-Build Alternative would not result	**Consistent.** Alternative 1C would encourage HOV and transit service use including buses. Further,	**Consistent.** Alternative 2 would be the same as Alternative 1C.	**Consistent.** Alternative 3 would be the same as Alternative 1C.	**Consistent.** Alternative 5 would be the same as Alternative 1C.

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
Policy 3.1: Work with employers to develop Transportation Demand Management plans to increase carpooling and encourage the use of public transportation, bicycling, and walking; consider other trip-reduction approaches such as telecommuting, shuttles, and transit passes.	in any changes to existing conditions, this alternative would not achieve the transportation improvements projected to result under the Build Alternatives and would be inconsistent with this goal.	Transportation Demand Management (TDM) strategies, such as traffic operation systems and traffic signal coordination, would be implemented as a Standardized Project Measure as part of the proposed Project under Alternative 1C.			
Goal 4: Reduce the number and length of commute trips made by single-occupancy vehicles.	**Inconsistent.** Because the No-Build Alternative would not result in any changes to existing conditions, this alternative would not achieve the transportation improvements projected to result under the Build Alternatives and would be inconsistent with this goal.	**Somewhat Consistent.** Alternative 1C would increase freeway capacity and speeds by closing a 7.5-mile gap between two existing managed lane segments on northbound I-680 with the addition of a northbound express lane from Livorna Road to SR-242. Alternative 1C would also convert an existing northbound HOV lane to an express lane. Alternative 1C would improve traffic flow and decrease congestion along I-680. However, the average trip	**Somewhat Consistent.** The only difference from Alternative 1C is that Alternative 2 would leave a 2-mile gap in managed lanes on northbound I-680 at the SR-24 Interchange. Therefore, Alternative 2 would be the same as Alternative 1C.	**Somewhat Consistent.** Alternative 3 represents the combined Project improvements proposed under Alternative 1C and Alternative 2. Therefore, Alternative 3 would be the same as Alternatives 1C and 2.	**Somewhat Consistent.** Alternative 5 is similar to Alternative 2. The primary difference between Alternative 2 and Alternative 5 is that Alternative 5 would not add any new lanes to northbound I-680. Instead, existing general-purpose and HOV lanes would be converted

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
		lengths resulting from Alternative 1C would be slightly higher but similar to the No-Build Alternative. Therefore, Alternative 1C would be somewhat consistent with this goal.			to a managed lane. Therefore, Alternative 5 would be the same as Alternative 2.
Goal 5: A cooperative regional transportation and land use planning process. **Policy 5.1:** Continue to participate in multi-jurisdictional transportation planning efforts.	**Not Applicable.** The No-Build Alternative would not result in any changes to existing conditions. Therefore, this goal and policy would not be applicable.	**Consistent.** The proposed Project is identified in ABAG and MTC's *Plan Bay Area 2050* as Project ID 21-T12-116. The proposed Project is consistent with the design concept and timely implementation as reflected in ABAG and MTC's adopted *Plan Bay Area 2050*. Further, coordination is ongoing between the multiple regional and local government agencies involved in the proposed Project under Alternative 1C to improve traffic conditions on I-680 throughout the jurisdictions located in the Project Study Limits. Therefore, Alternative 1C would be consistent with the City of Concord's goal and policy regarding participation in the regional	**Consistent.** Alternative 2 would be the same as Alternative 1C.	**Consistent.** Alternative 3 would be the same as Alternative 1C.	**Consistent.** Alternative 5 would be the same as Alternative 1C.

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
		transportation and land use planning process.			
City of Pleasant Hill General Plan					
Goal 6: Reduce congestion and vehicle trips through non-automobile transportation and public transit. **Policy 6B:** Encourage use of carpooling and ridesharing for local and regional travel. **Program 6.7:** Support new technologies that promote more effective use of transit and facilitate other innovative alternative modes of transportation. **Program 6.12:** Encourage development of infrastructure (public and private) to support the use of electric and	**Inconsistent.** Because the No-Build Alternative would not result in any changes to existing conditions, this alternative would not achieve the transportation improvements projected to result under the Build Alternatives and would be inconsistent with this goal and these programs.	**Consistent.** Alternative 1C would add and improve express lane travel options along northbound I-680. A purpose of the proposed Project is to relieve congestion along the I-680 corridor. All eligible vehicles, including buses, would be able to use express lanes, thereby encouraging HOV and transit service use. Therefore, Alternative 1C would reduce congestion and vehicle trips through non-automobile transportation and public transit and be consistent with this goal and these programs.	**Consistent.** Alternative 2 would be the same as Alternative 1C.	**Consistent.** Alternative 3 would be the same as Alternative 1C.	**Consistent.** Alternative 5 would be the same as Alternative 1C.

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
other alternative fuel vehicles.					
Goal 2: Ensure an efficient regional and local transportation system that will meet the needs of the overall growth within the city and the region. **Program 2.1:** Participate with TRANSPAC, CCTA, and other jurisdictions in an on-going multi-jurisdictional planning process. **Program 2.2:** Work with TRANSPAC and CCTA in the designation of Routes of Regional Significance. **Program 2.3:** Work with TRANSPAC to update and implement the Central County Action Plans for Routes of Regional Significance.	**Not Applicable.** The No-Build Alternative would not result in any changes to existing conditions. Therefore, this goal and these programs would not be applicable.	**Consistent.** The proposed Project is identified in ABAG and MTC's *Plan Bay Area 2050* as Project ID 21-T12-116. The proposed Project is consistent with the design concept and timely implementation as reflected in ABAG and MTC's adopted *Plan Bay Area 2050*. Further, CCTA and Caltrans are conducting ongoing coordination between the multiple regional and local government agencies involved in the proposed Project under Alternative 1C to improve traffic conditions on I-680, which is defined as a Route of Regional Significance in the City of Pleasant Hill General Plan. Therefore, Alternative 1C would be consistent with the City of Pleasant Hill's goal and programs regarding participation in the regional transportation and land use planning process.	**Consistent.** Alternative 2 would be the same as Alternative 1C.	**Consistent.** Alternative 3 would be the same as Alternative 1C.	**Consistent.** Alternative 5 would be the same as Alternative 1C.

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
City of Walnut Creek 2025 General Plan					
Goal 1: Minimize future increases in congestion on regional transportation facilities. **Policy 1.1:** In cooperation with State and regional agencies and other jurisdictions, develop and implement regional solutions to local traffic problems created by growth outside the city. **Action 1.1.3:** Work with TRANSPAC in implementing the Action Plan for Routes of Regional Significance.	**Not Applicable.** The No-Build Alternative would not result in any changes to existing conditions. Therefore, this goal, policy, and action would not be applicable.	**Consistent.** The proposed Project is identified in ABAG and MTC's *Plan Bay Area 2050* as Project ID 21-T12-116. The proposed Project is consistent with the design concept and timely implementation as reflected in ABAG and MTC's adopted *Plan Bay Area 2050*. Further, coordination is ongoing between the multiple regional and local government agencies, including those communities within the Project Study Limits that are a part of TRANSPAC, to implement the proposed Project under Alternative 1C, which would improve traffic conditions on I-680 within the Project Study Limits. Therefore, Alternative 1C would be consistent with the City of Walnut Creek's goal, policy, and action regarding the implementation of regional solutions to local traffic problems.	**Consistent.** Alternative 2 would be the same as Alternative 1C.	**Consistent.** Alternative 3 would be the same as Alternative 1C.	**Consistent.** Alternative 5 would be the same as Alternative 1C.

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
City of Lafayette General Plan					
Goal 8: Promote alternatives to the single-occupant automobile.	**Inconsistent.** Because the No-Build Alternative would not result in any changes to existing conditions, this alternative would not achieve the transportation improvements projected to result under the Build Alternatives and would be inconsistent with this goal.	**Consistent.** All eligible vehicles, including HOVs and buses, would be able to use express lanes, thereby encouraging the use of alternative modes of transportation other than single occupancy automobiles.	**Consistent.** Alternative 2 would be the same as Alternative 1C.	**Consistent.** Alternative 3 would be the same as Alternative 1C.	**Consistent.** Alternative 5 would be the same as Alternative 1C.
Goal 10: Work closely with neighboring jurisdictions and agencies responsible for roadways, transit facilities, and transit services in Lafayette. **Policy 10.1:** Participate in regional transportation planning in order to minimize adverse impacts on	**Not Applicable.** The No-Build Alternative would not result in any changes to existing conditions. Therefore, this goal and policy would not be applicable.	**Consistent.** The proposed Project is identified in ABAG and MTC's *Plan Bay Area 2050* as Project ID 21-T12-116. The proposed Project is consistent with the design concept and timely implementation as reflected in ABAG and MTC's adopted *Plan Bay Area 2050*. Further, coordination is ongoing between the multiple regional and local government	**Consistent.** Alternative 2 would be the same as Alternative 1C.	**Consistent.** Alternative 3 would be the same as Alternative 1C.	**Consistent.** Alternative 5 would be the same as Alternative 1C.

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
Lafayette's circulation system. Evaluation of proposed changes within Lafayette's circulation system must consider the seismic, soils, and scenic constraints in addition to the goals and policies of the Lafayette General Plan.		agencies within the Community Impact Study Area to improve traffic conditions on I-680 within in the Project Study Limits. Therefore, Alternative 1C would be consistent with the City of Lafayette's goal and policy regarding participation with neighboring jurisdictions and agencies responsible for roadways, transit facilities, and transit services in Lafayette.			
Town of Danville 2030 General Plan					
Goal 13: Create viable transportation alternatives to the single occupant automobile.	**Inconsistent.** Because the No-Build Alternative would not result in any changes to existing conditions, this alternative would not achieve the transportation improvements projected to result under the Build Alternatives	**Consistent.** Alternative 1C would add and improve managed lane travel options along northbound I-680. All eligible vehicles, including HOVs and buses, would be able to use express lanes, thereby supporting the use of managed lanes. Therefore, Alternative 1C would encourage the use of alternative modes of transportation other than single-occupant automobiles	**Consistent.** Alternative 2 would be the same as Alternative 1C.	**Consistent.** Alternative 3 would be the same as Alternative 1C.	**Consistent.** Alternative 5 would be the same as Alternative 1C.
Policy 13.4: Encourage ridesharing, car and vanpooling, infrastructure improvements (such as the Sycamore Valley Road Park and Ride Lot) and services which jointly reduce the need					

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
to travel by single-occupant automobile. **Policy 13.8:** Support the concepts of car-sharing and bike-sharing as an alternative mode of travel.	and would be inconsistent with this goal and these policies.	and would be consistent with this goal and these policies.			
Goal 16: Provide leadership and advocacy for improved transportation planning at the local, sub-regional, and regional levels. **Policy 16.1:** Work with other agencies, including neighboring cities, Contra Costa County, TVTC, CCTA, SWAT, County Connection, Caltrans, and MTC on multi-jurisdictional transportation issues affecting Danville. **Policy 16.2:** Participate in regional transportation systems	**Not Applicable.** The No-Build Alternative would not result in any changes to existing conditions. Therefore, this goal and policies would not be applicable.	**Consistent.** The proposed Project is identified in ABAG and MTC's *Plan Bay Area 2050* as Project ID 21-T12-116. The proposed Project is consistent with the design concept and timely implementation as reflected in ABAG and MTC's adopted *Plan Bay Area 2050*. Further, coordination is ongoing between the multiple regional and local government agencies to implement the proposed Project under Alternative 1C, which would improve traffic conditions on I-680 within the Project Study Limits. Therefore, Alternative 1C would be consistent with the Town of Danville's goals and policies regarding	**Consistent.** Alternative 2 would be the same as Alternative 1C.	**Consistent.** Alternative 3 would be the same as Alternative 1C.	**Consistent.** Alternative 5 would be the same as Alternative 1C.

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
management (TSM) programs and maintain a consistent local program.		participation in local, sub-regional, and regional transportation planning.			
Policy 16.3: Work closely with the County and other involved agencies to ensure that the Interstate 680 right-of-way shall be the route for any future light rail or equivalent mass transit system. Any investment in fixed-route transit shall avoid adversely affecting the residential character of Danville's neighborhoods and Danville's street system.					
Policy 16.4: Encourage regional and sub-regional transportation agencies to consider local land use policies and growth management strategies when examining proposals for new transportation facilities.					

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
City of San Ramon General Plan 2035					
Guiding Policy 5.2-G-1: Actively participate in local and regional transportation planning. **Implementing Policy 5.2-I-1:** Continue to develop and implement Action Plans for Routes of Regional Significance, in cooperation with the SWAT, the CCTA, and TVTC. **Implementing Policy 5.2-I-5:** Emphasize regional transportation demand management and trip reduction strategies as alternatives to improvements to existing facilities and the construction of new facilities.	**Not Applicable.** The No-Build Alternative would not result in any changes to existing conditions. Therefore, this guiding policy and implementing policies would not be applicable.	**Somewhat Consistent.** The proposed Project is identified in ABAG and MTC's *Plan Bay Area 2050* as Project ID 21-T12-116. The proposed Project is consistent with the design concept and timely implementation as reflected in ABAG and MTC's adopted *Plan Bay Area 2050*. Coordination is ongoing between the multiple regional and local government agencies involved in the proposed Project under Alternative 1C to improve traffic conditions on I-680 throughout the jurisdictions located in the Project Study Limits. Further, Alternative 1C would improve traffic flow and decrease congestion along I-680. Alternative 1C would add and improve HOV and Express Lane travel options along northbound I-680. All eligible vehicles, including HOVs and buses, would be able to use express lanes, thereby incentivizing the use of transit, vanpools, clean air	**Somewhat Consistent.** Alternative 2 would be the same as Alternative 1C.	**Somewhat Consistent.** Alternative 3 would be the same as Alternative 1C.	**Somewhat Consistent.** Alternative 5 is similar to Alternative 2. The primary difference between Alternative 2 and Alternative 5 is that Alternative 5 would not add any new lanes to northbound I-680. Instead, existing general-purpose and HOV lanes would be converted to a managed lane.

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
		vehicles, and carpools. However, the average trip lengths resulting from Alternative 1C would be slightly higher but similar to the No-Build Alternative. Therefore, Alternative 1C would be somewhat consistent with the City of San Ramon's guiding policy and implementing policies regarding participation in local, sub-regional, and regional transportation planning.			
Guiding Policy 3.1-G-1: Manage the City's growth in a way that balances existing and planned transportation facilities, protection of open space and ridgelines, provision of diverse housing options, and the preservation of high-quality community facilities and services. **Implementing Policy 3.1-I-6:** Join with and encourage other	**Not Applicable.** The No-Build Alternative would not result in any changes to existing conditions. Therefore, this guiding policy and implementing policy would not be applicable.	**Consistent.** Alternative 1C would not induce growth because the proposed Project under Alternative 1C would be built along an existing corridor and is consistent with applicable land use plans. Further, coordination is ongoing between the multiple regional and local government agencies involved in the proposed Project under Alternative 1C to improve traffic conditions on I-680 throughout the jurisdictions	**Consistent.** Alternative 2 would be the same as Alternative 1C.	**Consistent.** Alternative 3 would be the same as Alternative 1C.	**Consistent.** Alternative 5 would be the same as Alternative 1C.

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
jurisdictions to participate in regional transportation planning programs.		located in the Project Study Limits.			
Guiding Policy 3.4-G-1: Utilize TDM strategies as an integral component of the City's transportation program to reduce total vehicle trips on San Ramon roadways and reduce the corresponding vehicle emissions that promote regional air quality improvements.	**Inconsistent.** Because the No-Build Alternative would not result in any changes to existing conditions, this alternative would not achieve the transportation improvements projected to result under the Build Alternatives and would be inconsistent with this goal and these policies.	**Consistent.** Alternative 1C would close a 7.5-mile gap between two existing managed lane segments on northbound I-680 with the addition of a northbound express lane from Livorna Road to SR-242. Alternative 1C would convert an existing northbound HOV lane to an express lane and implement, as feasible, Transportation Demand Management strategies, such as traffic operation systems and traffic signal coordination, which are a Standardized Project Measure as part of the proposed Project under all Build Alternatives. Further, the proposed improvements under Alternative 1C would mostly be implemented north of San Ramon and Danville. The proposed Project is also included as part of the Measure J Expenditure Plan.	**Consistent.** Alternative 2 includes many of the same improvements as Alternative 1C. The only difference is that Alternative 2 would leave a 2-mile gap in managed lanes on northbound I-680 at the SR-24 Interchange. Alternative 2 would be the same as Alternative 1C.	**Consistent.** Alternative 3 would be the same as Alternative 1C.	**Consistent.** Alternative 5 would be the same as Alternative 1C.
Implementing Policy 3.4-I-6 Locate future transit uses, such as light rail or BART, in the I-680 right-of-way. San Ramon, Danville, and Contra Costa County have adopted a memorandum of understanding that designates the I-680 right-of-way as the preferred alignment for future rail transit					

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
service through the San Ramon Valley for the purpose of serving major employment centers. The Measure J Transportation Expenditure Plan allocates funding for the I-680 Carpool Lane Gap Closure/Transit Corridor Improvements including proposed HOV on/off ramps at Norris Canyon Road, auxiliary lanes, and increased express bus service for the San Ramon Valley.					
Guiding Policy 3.5-G-1: Participate in regional cooperative and multi-jurisdictional transportation planning for the maintenance of regional mobility and air quality standards as required by the Measure J Growth Management Program and the Contra Costa Congestion	**Not Applicable.** The No-Build Alternative would not result in any changes to existing conditions. Therefore, this guiding policy and implementing	**Consistent.** The proposed Project is identified in ABAG and MTC's *Plan Bay Area 2050* as Project ID 21-T12-116. The proposed Project is consistent with the design concept and timely implementation as reflected in ABAG and MTC's adopted *Plan Bay Area 2050*. Coordination is ongoing between the multiple regional and local government	**Consistent.** Alternative 2 would be the same as Alternative 1C.	**Consistent.** Alternative 3 would be the same as Alternative 1C.	**Consistent.** Alternative 5 would be the same as Alternative 1C.

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
Management Plan (CMP).	policies would not be applicable.	agencies involved in the proposed Project under Alternative 1C to improve traffic conditions on I-680 throughout the jurisdictions located in the Project Study Limits. Further, Alternative 1C would implement, as feasible, Transportation Demand Management strategies, such as traffic operation systems and traffic signal coordination, which are a Standardized Project Measure as part of the proposed Project under Alternative 1C.			
Implementing Policy 3.5.-I-1: Continue to develop and implement Action Plans for Routes of Regional Significance, in cooperation with the Southwest Area Transportation Committee (SWAT), the Contra Costa Transportation Authority (CCTA), and the Tri-Valley Transportation Council (TVTC).					
Implementing Policy 3.5-I-3: Participate in programs to mitigate regional traffic congestion, including implementation of regional and sub-regional traffic impact fees on new development.					
Implementing Policy 3.5-I-4: Emphasize					

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
regional transportation demand management and trip reduction strategies as alternatives to increased roadway capacity.					
Contra Costa Countywide Bicycle and Pedestrian Plan					
Goal 3: Create a safe, connected, and comfortable network of bikeways and walkways for all ages and abilities	**Not Applicable.** The No-Build Alternative would not result in any changes to existing conditions. Therefore, this goal would not be applicable.	**Consistent.** As discussed in Section 2.1.3, *Parks and Recreational Facilities*, the proposed Project under Alternative 1C would require temporary closures of portions of the Iron Horse Regional Trail and the Contra Costa Canal Trail/Briones to Mount Diablo Regional Trail. However, with implementation of Measures **PR-1** to **PR-4** to avoid and/or minimize temporary and permanent impacts to park and recreational facilities, the proposed Project under Alternative 1C would maintain a safe and connected network of bikeways and walkways within the Community Impact Study Area.	**Consistent.** Alternative 2 would be the same as Alternative 1C.	**Consistent.** Alternative 3 would be the same as Alternative 1C.	**Consistent.** Alternative 5 would be the same as Alternative 1C.

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
East Bay Regional Park District Master Plan 2013					
Goal: Provide a diversified system of regional parklands, trails and related services that will offer outstanding opportunities for creative use of outdoor time.	**Not Applicable.** The No-Build Alternative would not result in any changes to existing conditions. Therefore, these goals would not be applicable.	**Consistent.** As discussed in Section 2.1.3, *Parks and Recreational Facilities*, the proposed Project under Alternative 1C would require temporary closures of portions of the Iron Horse Regional Trail and the Contra Costa Canal Trail/Briones to Mount Diablo Regional Trail. However, with implementation of Measures **PR-1** to **PR-4** to avoid and/or minimize temporary and permanent impacts to park and recreational facilities, the proposed Project under Alternative 1C would maintain a safe and connected network of bikeways and walkways within the Community Impact Study Area. Further, coordination is ongoing between the multiple regional and local government agencies involved in the proposed Project, including EBRPD, to improve traffic conditions on I-680 throughout the	**Consistent.** Alternative 2 would be the same as Alternative 1C.	**Consistent.** Alternative 3 would be the same as Alternative 1C.	**Consistent.** Alternative 5 would be the same as Alternative 1C.
Goal: Participate in partnerships with public agencies, nonprofit organizations, volunteers, and the private sector to achieve mutual goals.					

Policy/Goal	No-Build Alternative	Alternative 1C	Alternative 2 *	Alternative 3	Alternative 5
		jurisdictions located in the Project Study Limits.			

Sources: (HDR Engineering, Inc., 2023); (Contra Costa County, 2014); (California Department of Transportation, 2012); (California Department of Transportation, 2023a); (Contra Costa Transportation Authority, 2011); (Tri-Valley Transportation Council, 2017); (Contra Costa Transportation Authority, 2018); (East Bay Regional Park District, 2013)

Notes: ABAG = Association of Bay Area Governments; BART = Bay Area Rapid Transit; CCTA = Contra Costa Transportation Authority; CMP = Congestion Management Plan; EA = Environmental Assessment; EBRPD = East Bay Regional Park District; EIR = Environmental Impact Record; HOV = High-occupancy Vehicle; LEP = Limited English Proficiency; MTC = Metropolitan Transportation Commission; RTP = Regional Transportation Plan; RTPC = Regional Transportation Planning Committee; SCS = Sustainable Communities Strategy; SR = State Route; SWAT = Southwest Area Transportation Committee; TDM = Transportation Demand Management; TIP = Transportation Improvement Program; TRANSPAC = Transportation Partnership and Cooperation; TSM = Transportation Systems Management; TVTC = Tri-Valley Transportation Council

* Alternative 2 is the preferred alternative.

Build Alternatives (Alternatives 1C, 2, 3, and 5)

Construction under all Build Alternatives would not result in inconsistencies with adopted goals and policies of applicable federal, State, regional, and local plans in Table 2.1.2-1, specifically *Plan Bay Area 2050*, *Central County Action Plan for Routes of Regional Significance*, and each of the applicable City and County general plans. Further, under all Build Alternatives, the proposed Project would largely be constructed within existing State right-of-way. Therefore, no temporary adverse direct or indirect impacts would occur under any of the Build Alternatives.

The Build Alternatives would encourage the use of alternative modes of transportation, such as transit and rideshare usage, and offer HOV and express lane travel options that would encourage people to combine automobile trips, which would indirectly decrease congestion and greenhouse gas emissions and reduce overall single-occupancy automobile usage. As summarized in Table 2.1.2-1, under all Build Alternatives, the proposed Project would be generally consistent with adopted goals and policies of applicable federal, State, regional, and local plans. Specifically, the proposed Project would be consistent with the *2025 TIP* (Project ID CC-170017), *Plan Bay Area 2050* (Project ID 21-T12-116), and the *Measure J Expenditure Plan*, which plan to implement express lanes on northbound I-680 that would improve travel speeds for motorists and reduce stop and go traffic. In accordance with Measure **CIA-1**, coordination is ongoing between the multiple regional and local government agencies involved in the proposed Project to improve traffic conditions on I-680 within Contra Costa County. Therefore, no permanent adverse direct or indirect impacts would occur under any of the Build Alternatives.

2.1.2.3 Summary

Alternative 2 has been selected as the preferred alternative. As described above and in Table 2.1.2-1, Consistency with State, Regional, and Local Plans and Programs*, Alternative 2 would be generally consistent with the adopted goals and policies of applicable federal, state, regional, and local plans. Measure* ***CIA-1*** *would be implemented requiring that the Project continue to coordinate with regional and local agencies during final design. Therefore, impacts would not be adverse.*

2.1.2.4 Avoidance, Minimization, and/or Mitigation Measures

CIA-1 During the design phase, CCTA and Caltrans will continue to coordinate with the multiple regional and local government agencies involved in the proposed Project to improve traffic conditions along I-680 within Contra Costa County.

2.1.3 Parks and Recreational Facilities

2.1.3.1 Regulatory Setting

The Park Preservation Act (California Public Resources Code [PRC] Sections 5400-5409) 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.

2.1.3.2 Affected Environment

This following discussion is based on the proposed Project's *Community Impact Assessment* (HDR Engineering, Inc., 2023), which was completed in November 2023. The Community Impact Study Area is described in Section 2.1.1, *Existing and Future Land Use*.

As depicted in Figure 2.1.3-1, a total of 33 public parks, 5 recreation areas, 1 wildlife refuge, and 40 bike, pedestrian, and equestrian paths are located within the Community Impact Study Area, some of which are adjacent to I-680 right-of-way (ROW) or cross under the I-680 corridor. More information regarding these park and recreational facilities is provided in Table 2.1.3-1 and Table 2.1.3-2, including locations, descriptions, and amenities.

Table 2.1.3-1. Public Parks and Other Recreational Facilities within the Community Impacts Study Area

Type	Jurisdiction	Name	Figure Reference Number[1]	Location	Description and Amenities
Park	Contra Costa County	Andrew H. Young Park	P21	1471 Jackson Way, Alamo	Open Access, Landscaping, Tables, Walking Path, Memorial Plaque
Park	Contra Costa County	Fox Creek Park	P8	118 Anthony Way, Walnut Creek	Open Access, Picnic Tables, Benches, Pedestrian Bridge

Type	Jurisdiction	Name	Figure Reference Number[1]	Location	Description and Amenities
Park	Contra Costa County	Pacheco Creekside Park (Hayden Park)	P4	Aspen Drive, Martinez, along Grayson Creek	Open Access, Benches, Trashcans, Trails, Landscaping
Park	Contra Costa County	Hemme Station Park	P20	1193 Danville Boulevard, Alamo	Open Access, Picnic Tables, Landscaped Areas, Gazebos, Benches, Restrooms, Children's Play Areas, Walking Path, Adjacent to Iron Horse Regional Trail
Golf Course	Contra Costa County	Buchanan Fields Golf Course	P2	1091 Concord Avenue, Concord	9-Hole Golf Course, Driving Range, 18-Hole Putting Course
Park	City of Concord	Cambridge Park	P7	Victory Lane, Concord, adjacent to Cambridge Elementary School	Open Access, Picnic Table, Playground, Soccer Field, Children's Play Area, Expansive Turfed Play Fields for Soccer and Casual Play, Picnic Tables, and Shade Trees
Park	City of Concord	Len Hester Community Park	P11	Hookston Road and Hampton Drive, Concord	Open Access, Picnic Areas, Walking Track, Lawn, and Trees

Type	Jurisdiction	Name	Figure Reference Number[1]	Location	Description and Amenities
Park	City of Concord	Meadow Homes Park	P6	Sunshine Avenue and Detroit Avenue, Concord, next to Meadow Homes School	Open Access, Spray Park, Multi-Use Sports Fields, Picnic/ Barbecue Areas, Landscaping
Park	Pleasant Hill Recreation and Park District	Chilpancingo Park	P1	Golf Club Road, Pleasant Hill, along Grayson Creek	Open Access, Trails with Redwood and Oak Trees
Park	Pleasant Hill Recreation and Park District	Pleasant Hill Park	P5	147 Gregory Lane, Pleasant Hill	Open Access, Group Picnic Sites, Playground Tables, Softball Diamond (No Lights), Basketball Courts, Horseshoe Pits, Children's Playground and Tot Lot, Community Gardens, Pool, and Diving Pool
Park	Pleasant Hill Recreation and Park District	Shadowood Park	P3	69 Spar Court, Pleasant Hill, along Grayson Creek	Open Access, Playground, Landscaping, Trails, Basketball Hoop, Parking Area
Park	Pleasant Hill Recreation and Park District	Sherman Acres Park	P34	Sherman Drive, Pleasant Hill	Open Access, Benches, Picnic Area, Children's Play Area, Landscaping.

Type	Jurisdiction	Name	Figure Reference Number[1]	Location	Description and Amenities
Park	Pleasant Hill Recreation and Parks District	Pleasant Oaks Park	P9	2 Santa Barbara Road, Pleasant Hill	Open Access, Baseball/Softball Diamond, Paved Walking Path, Picnic Areas, Picnic Shelters, Playground, Soccer Field, Batting Cages
Park	City of Walnut Creek	Acalanes Ridge Open Space	P16	Sousa Drive, Walnut Creek	Open Access, 4 Miles of Trails, Limited Parking, No Developed Facilities, Connections to Briones-to-Mt. Diablo Trail
Park	City of Walnut Creek	Alma Park	P13	California Boulevard at Botelho Drive, Walnut Creek	Open Access, Lawn, Benches, Decorative Arbors, Picnic Area, Street Parking Only, Dogs Allowed on Leash

Type	Jurisdiction	Name	Figure Reference Number[1]	Location	Description and Amenities
Park	City of Walnut Creek	Civic Park	P12	1375 Civic Drive, Walnut Creek	Open Access, Playgrounds, Community Center, Dogs Allowed on Leash, Gazebo, Seasonal Ice Rink, Library, Parking Available, Picnic Area, Restroom, Trail Connections to Iron Horse Regional Trail and Creek Walk, Habitat Gardens
Park	City of Walnut Creek	Lancaster Park (Remembrance Park)	P15	Lancaster Road at Lilac Drive, Walnut Creek	Open Access, Benches, Picnic Tables, Plantings, Dogs Allowed on Leash
Park	City of Walnut Creek	Parkmead Pocket Park	P14	1671 Newell Avenue, Walnut Creek	Open Access, Open Space with Tree and Sign
Park	City of Walnut Creek	Sugarloaf Open Space	P18	2161 Youngs Valley Road, Walnut Creek	Open Access, 3 miles of Trails, Ranger Station, Picnic Tables, Amphitheater, Group Camping

Type	Jurisdiction	Name	Figure Reference Number[1]	Location	Description and Amenities
Park	City of Walnut Creek	Walden Park	P10	2698 Oak Road, Walnut Creek	Open Access, Playground, Basketball Court, Disc Golf Course, Dogs Allowed on Leash, Handball Court, Parking Available, Picnic Area, Trail Connections to Contra Costa Canal Trail/Briones to Mount Diablo Regional Trail and Iron Horse Regional Trail
Park	County of Contra Costa and San Ramon Unified School District	Alamo Elementary School Field and Batting Cages (Elem Park)	P17	100 Wilson Rd, Alamo	Restricted Access, Community Park, Youth Baseball Field, Batting Cage, Soccer Field, Picnic Barbeque Area, Multi-use Sport Courts
Park	Town of Danville	Bret Harte Park	P29	Diablo Road and Camino Tassajara, Danville	Open Access, Picnic Tables, Basketball Courts, Playgrounds

Type	Jurisdiction	Name	Figure Reference Number[1]	Location	Description and Amenities
Park	Town of Danville	Danville Community Center/ Town Green	P26	420 Front Street, Danville	Open Access, Two-Building Complex, Plaza, Bandstand, Passive Open Space and Ancillary Parking
Park	Town of Danville	Danville South Park	P24	1885 Camino Ramon, Danville	Open Access, Lawn Area, Basketball Court, Play Structures, Swings, Sand Area, Benches, Picnic Tables, Portable Bathrooms
Park	Town of Danville	Eugene O' Neill Commemor-ative/Front Street Park	P25	403 Front Street, Danville	Open Access, Picnic Table, Benches, Drinking Fountain, Public Art
Park	Town of Danville	Greenbrook School Park	P23	1475 Harlan Dr, Danville	Open Access, Picnic Tables, Children's Play Areas, Connection to Iron Horse Regional Trail

Type	Jurisdiction	Name	Figure Reference Number[1]	Location	Description and Amenities
Park	Town of Danville	Hap Magee Ranch Park	P19	1025 La Gonda Way, Danville	Open Access, Picnic Area, Barbeque, Playgrounds, Commemorative Drinking Fountain, Volleyball, Rental Buildings, Restroom, Gazebo, Benches, Off Street Parking, Community Garden, Dog Park, Water Play Features
Park	Town of Danville	Midden Area	P22	Briar Place and Meadowside Place, Danville	Open Access, Open space
Park	Town of Danville	Osage Station Park	P27	816 Brookside Dr, Danville	Open Access, Four Tennis Courts, Four Baseball Diamonds, Five Soccer Fields, Walking Path, Picnic Tables, Barbeque Pits, Children's Play Area, Three Osage Orange Trees
Park	Town of Danville	Prospect Corner Park	P30	Prospect Avenue and Harz Avenue, Danville	Open Access, seating area, kiosk

Type	Jurisdiction	Name	Figure Reference Number[1]	Location	Description and Amenities
Park	Town of Danville	Iron Horse Regional Trail (Prospect/ Quinterra Rest Area)	P31	Prospect Ave, Danville	Open Access, trail rest area
Park	Town of Danville	Railroad Plaza	P32	Railroad Avenue, Danville	Open Access, kiosk
Park	Town of Danville	Iron Horse Regional Trail (San Ramon Valley Blvd. Rest Area)	P28	Along Iron Horse Trail, Danville	Open Access, trail rest area
Park	Town of Danville	West El Pintado Pocket Park	P33	Adjacent to El Pintado between Valley Creek Lane and Diablo Road, Danville	Open Access, Benches, Creek Overlooks
Refuge	East Bay Regional Park District	Waterbird Regional Preserve	RG1	801 Waterbird Way, Martinez	Open Access, Parking Area, Loop Road, Hiking Trails, Al McNabney Marsh

Sources: (HDR Engineering, Inc., 2023); (City of Concord, 2002) (Contra Costa Transportation Authority, 2018); (GreenInfo Network, n.d.); (Town of Danville, 2012); (Town of Danville, 2017)
Notes:
[1] Figure Reference Numbers correspond to Figure 2.1.3-1.

Table 2.1.3-2. Trails and Bicycle Paths within the Community Impact Study Area

Trail Name	Figure Reference Number[1]	Type
Iron Horse Regional Trail	T1	Existing Trail
Contra Costa Canal Trail/Briones to Mount Diablo Regional Trail	T2	Existing Trail

Trail Name	Figure Reference Number[1]	Type
EBMUD Trail	T3	Existing Trail
Freitas Road Trail	T4	Existing Trail
Las Trampas to Mt Diablo Regional Trail	T5	Existing Trail
Monument Corridor Trail	T6	Existing Trail
John Muir Trail	T7	Existing Trail
Danville Fire Trail/Fiddleneck Trail	T8	Existing Trail
Bay Area Ridge Trail (Martinez Shoreline Segment)	T9	Existing Trail
Sugarloaf Shell Ridge Trail	T10	Existing Trail
Trail along walnut creek	T11	Existing Trail
Parkmead Walking Path	T12	Existing Trail
Grayson Creek Trail	T13	Existing Trail
Remington Loop Trailhead	T14	Existing Trail
Along San Ramon Creek connecting Iron Horse Trail	T15	Potential Trail
Along Las Trampas Creek and Olympic Blvd	T16	Potential Trail
T16 connection	T17	Potential Trail
Potential Trail	T18	Potential Trail
Contra Costa Canal Proposed Trail	T19	Proposed Trail
Mokelumne Aqueduct Trail	T20	Proposed Trail
Waterfront Rd to Pacheco creek connecting T1 Trail	T21	Proposed Trail
Mayette Hanson Connector	T22	Proposed Trail
Southwest BART Trail	T23	Proposed Trail
Pine Creek bike path	B10	Existing Bike Path

Trail Name	Figure Reference Number[1]	Type
Path along BART (under the bridge)	B11	Existing Bike Path
City of Concord planned bike path	B38	Planned Bike Path
City of Concord planned bike path	B39	Planned Bike Path
City of Concord planned bike path	B40	Planned Bike Path
Livorna Road Trail	B41	Planned Bike Path
Proposed bike path	B42	Planned Bike Path
City of Concord bike path	B43	Planned Bike Path
Iron Horse Regional Trail	T1	Existing Trail
Contra Costa Canal Trail/Briones to Mount Diablo Regional Trail	T2	Existing Trail
EBMUD Trail	T3	Existing Trail
Freitas Road Trail	T4	Existing Trail

Source: (HDR Engineering, Inc., 2023)
Notes:
[1] Figure Reference Numbers correspond to Figure 2.1.3-1.

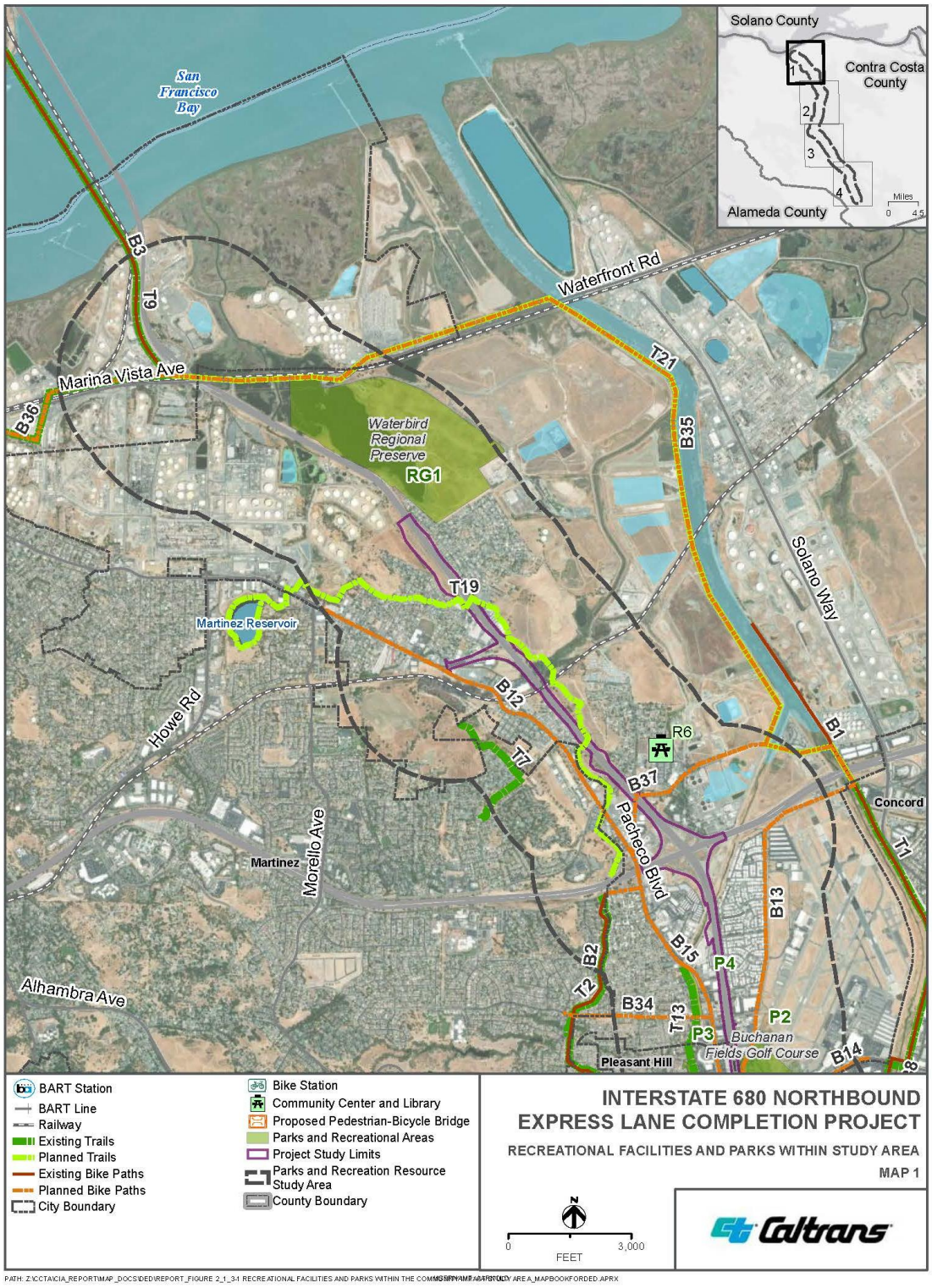


Figure 2.1.3-1. Recreational Facilities and Parks within the Community Impact Study Area (Map 1 of 4)

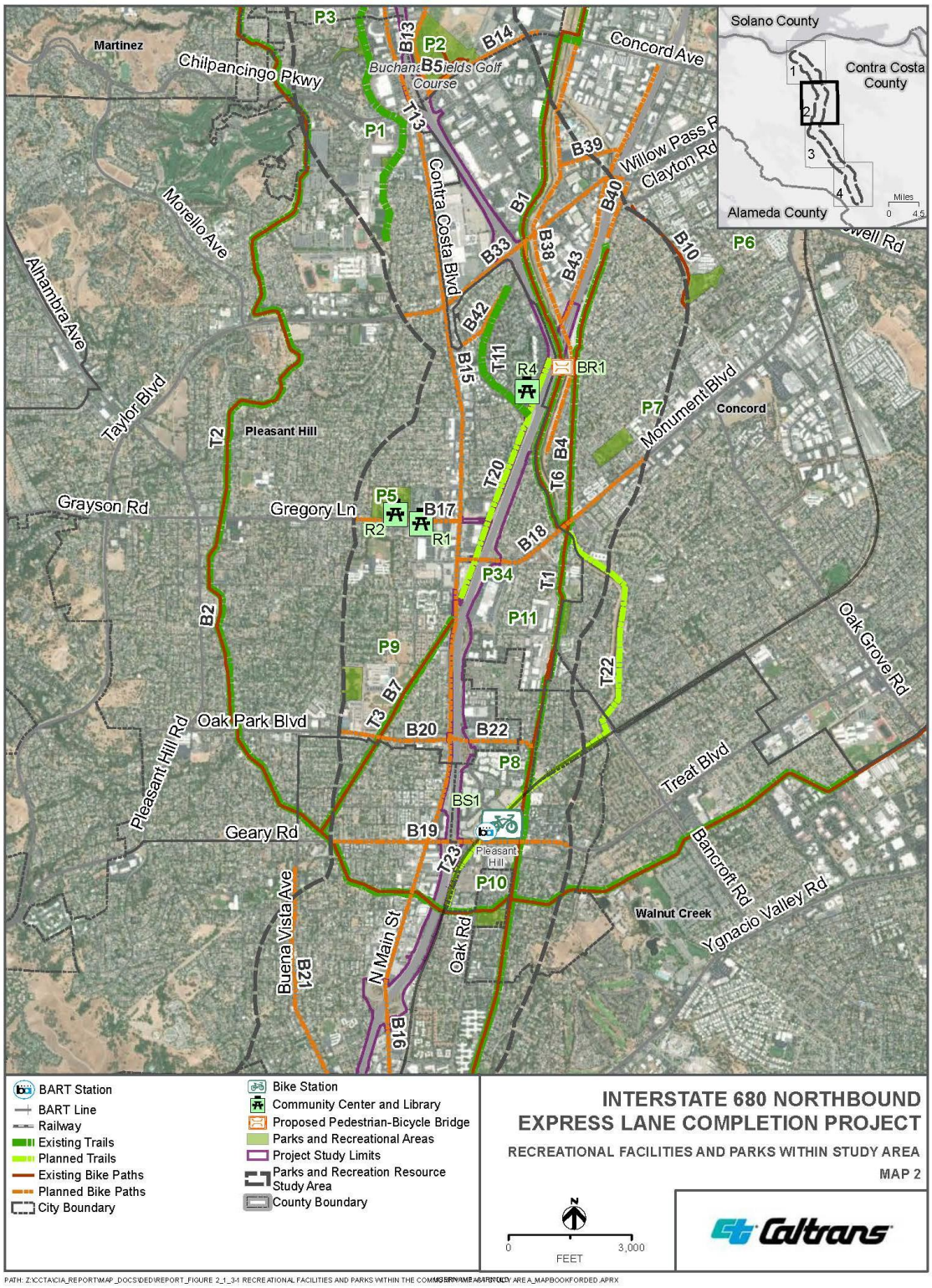


Figure 2.1.3-1. Recreational Facilities and Parks within the Community Impact Study Area (Map 2 of 4)

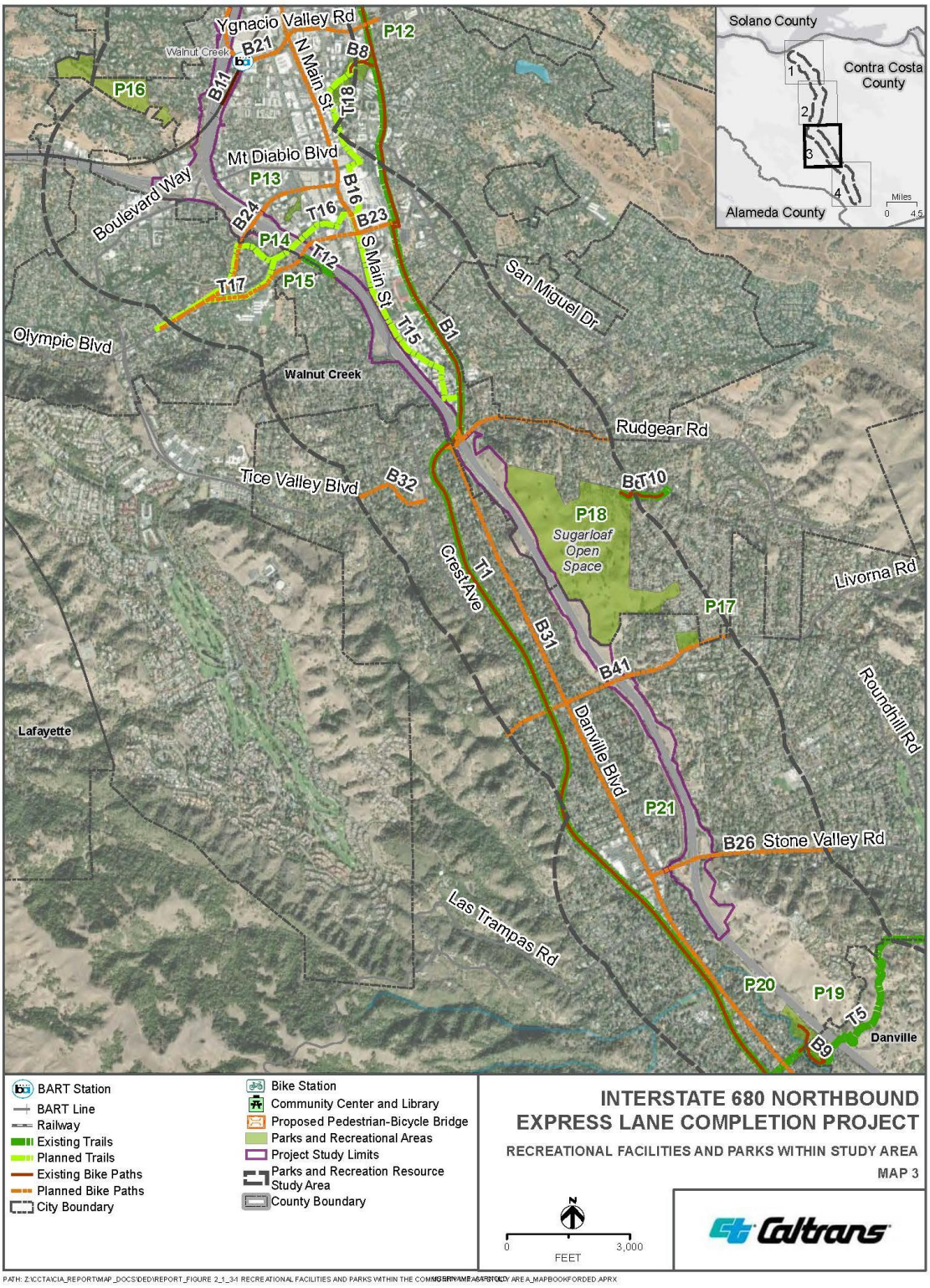


Figure 2.1.3-1. Recreational Facilities and Parks within the Community Impact Study Area (Map 3 of 4)

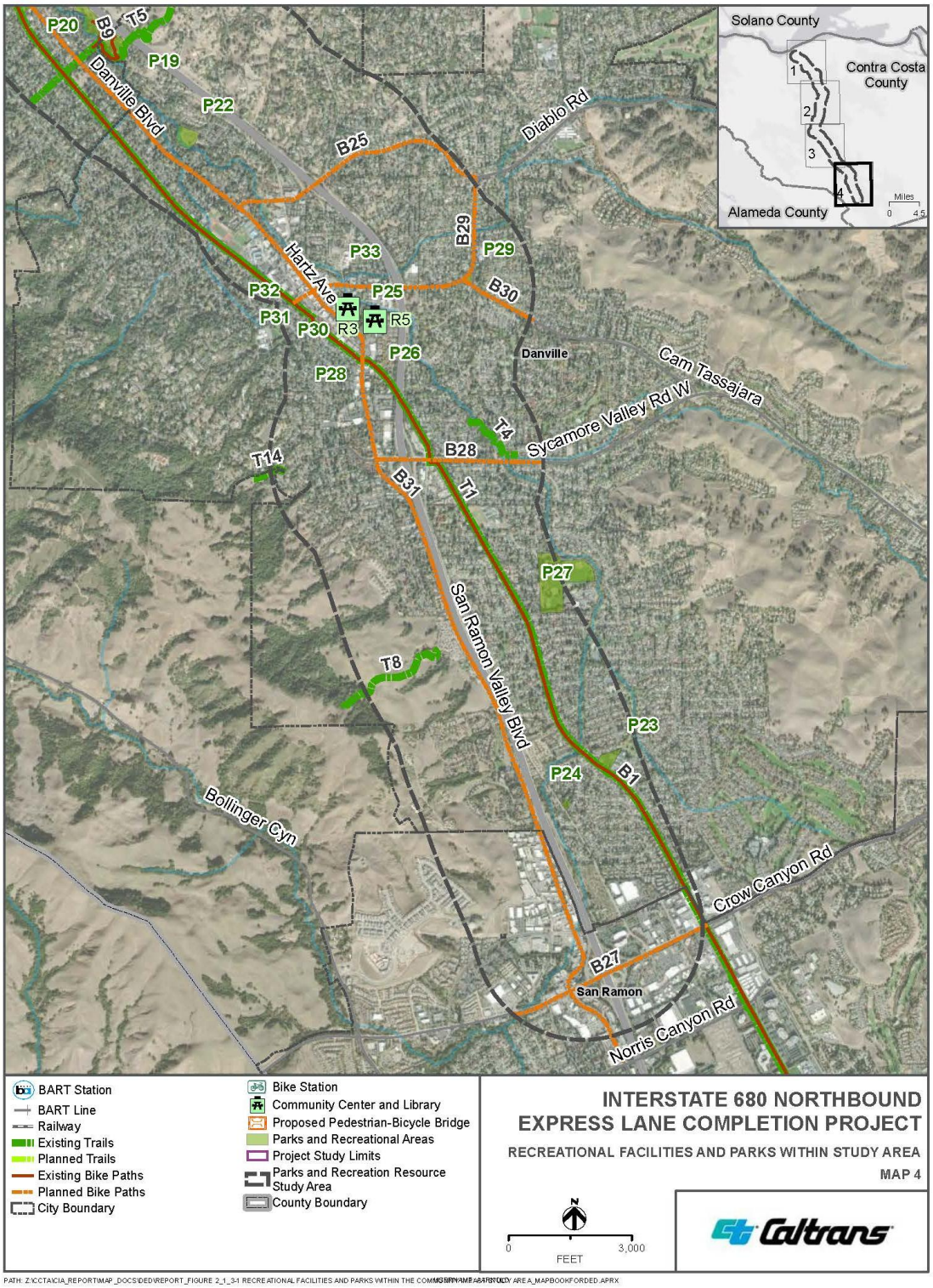


Figure 2.1.3-1. Recreational Facilities and Parks within the Community Impact Study Area (Map 4 of 4)

2.1.3.3 Environmental Consequences

There are parks and recreational facilities within the Project vicinity that are protected by Section 4(f) of the Department of Transportation Act of 1966. This Project will result in a "use" of those facilities as defined by Section 4(f). Please see Appendix A, *Section 4(f)*, for additional details.

No-Build Alternative

The No-Build Alternative would maintain the current configurations of I-680 in the Study Area. Under the No-Build Alternative, the proposed Project would not be constructed, and no impacts on parks or recreational facilities would occur.

Build Alternatives (Alternatives 1C, 2, 3, and 5)

All Build Alternatives would be largely contained within State ROW. The Build Alternatives would not require the temporary or permanent use of any publicly owned park. Potential increases in ambient noise levels during construction could result in noise impacts in areas where parks and recreational facilities are located. However, the noise levels during construction would be temporary and limited, as discussed further in Section 2.2.7, *Noise and Vibration*.

As described below, Alternatives 1C, 2, and 3 would require a temporary detour and permanent shift of the Iron Horse Regional Trail at the Rudgear Road Undercrossing Bridge. In addition, Alternatives 2, 3, and 5 would require a temporary detour of the Contra Costa Canal Trail/Briones to Mount Diablo Regional Trail at the Contra Costa Canal Undercrossing Bridge. However, public access to all the impacted trails would be maintained during construction, as described below.

Iron Horse Regional Trail

The Iron Horse Regional Trail is adjacent to I-680 and crosses under State Route (SR) 242 at the SR-242 Interchange. The Iron Horse Regional Trail also crosses under I-680 within the Project Study Limits at Rudgear Road and again at Laurel Drive. The East Bay Regional Park District is the official with jurisdiction over this trail.

Alternatives 1C, 2, and 3 would replace existing sound barriers (Existing Barriers E.1, E.2, and E.3) with a new soundwall adjacent to the Iron Horse Regional Trail in the vicinity of the SR-242 Interchange, which is described further in Section 2.2.7, *Noise and Vibration*. At this location, all work would be completed within State ROW and the Iron Horse Regional Trail would remain open. There are no benches or other amenities at this location. The potential exposure to noise and views associated with construction for Alternatives 1C, 2, and 3 would be temporary and is not expected to affect use of the trail at this location, which is described further in Section 2.1.9, *Visual/Aesthetics*, and Section 2.2.7, *Noise and Vibration*.

Alternatives 1C, 2, and 3 include widening the Rudgear Road Undercrossing Bridge over the Iron Horse Regional Trail. Widening the Rudgear Road Undercrossing Bridge would require installing a new bridge column in the existing paved footprint of the Iron Horse Regional Trail. In order to protect workers and the public during construction, a segment of the Iron Horse Trail under the Rudgear Road Undercrossing Bridge (approximately 500 feet of trail) would be closed temporarily for up to 4 weeks (see Figure 2.1.3-2). However, the trail would remain open during construction with detours.

Measure **PR-1** would be implemented for Alternatives 1C, 2, and 3, requiring coordination with the East Bay Regional Park District (EBRPD) to identify potential temporary detours for trail users along this segment of the Iron Horse Regional Trail, prior to and during construction. As depicted in Figure 2.1.3-2, a temporary detour has been proposed along Rudgear Road for the purposes of this assessment. Falsework would be installed to support bridge widening and prevent any debris from falling onto the public and canal water passing under falsework during the remainder of the bridge widening. In addition, Measure **PR-2** would be implemented, which requires temporary construction areas to be rehabilitated to a condition as good or better than that prior to construction. With the implementation of **PR-1** and **PR-2**, public access to all impacted trails would be maintained during construction.

Once Project construction is complete, the full use of the trail would be restored. Measure **PR-3** would be implemented requiring coordination with EBRPD to identify a suitable permanent shift of the Iron Horse Regional Trail under the bridge to avoid the proposed bridge column. The Project avoids directly impacting the Iron Horse Regional Trail parking lot on Danville Boulevard and the Rudgear Road Park and Ride at the Rudgear Road/Bishop Lane Intersection. In addition, there are no benches or other fixed amenities on the segment of the trail under Rudgear Road Undercrossing Bridge. The trail is currently exposed to the sights and sounds of vehicular traffic on I-680 above the trail. As such, trail users are not anticipated to remain in any one location of the trail more than momentarily as they pass by.

Alternative 5 would not replace Existing Barriers E.1, E.2, and E.3 south of the SR-242 Interchange. Alternative 5 would also not widen the Rudgear Road Undercrossing Bridge.

Given the existing setting and the brief duration of recreationists' potential exposure to noise and views associated with construction, as well as implementation of Measures **PR-1** through **PR-3**, none of the Build Alternatives are expected to result in substantial adverse temporary or permanent direct or indirect impacts on the Iron Horse Regional Trail or its users.

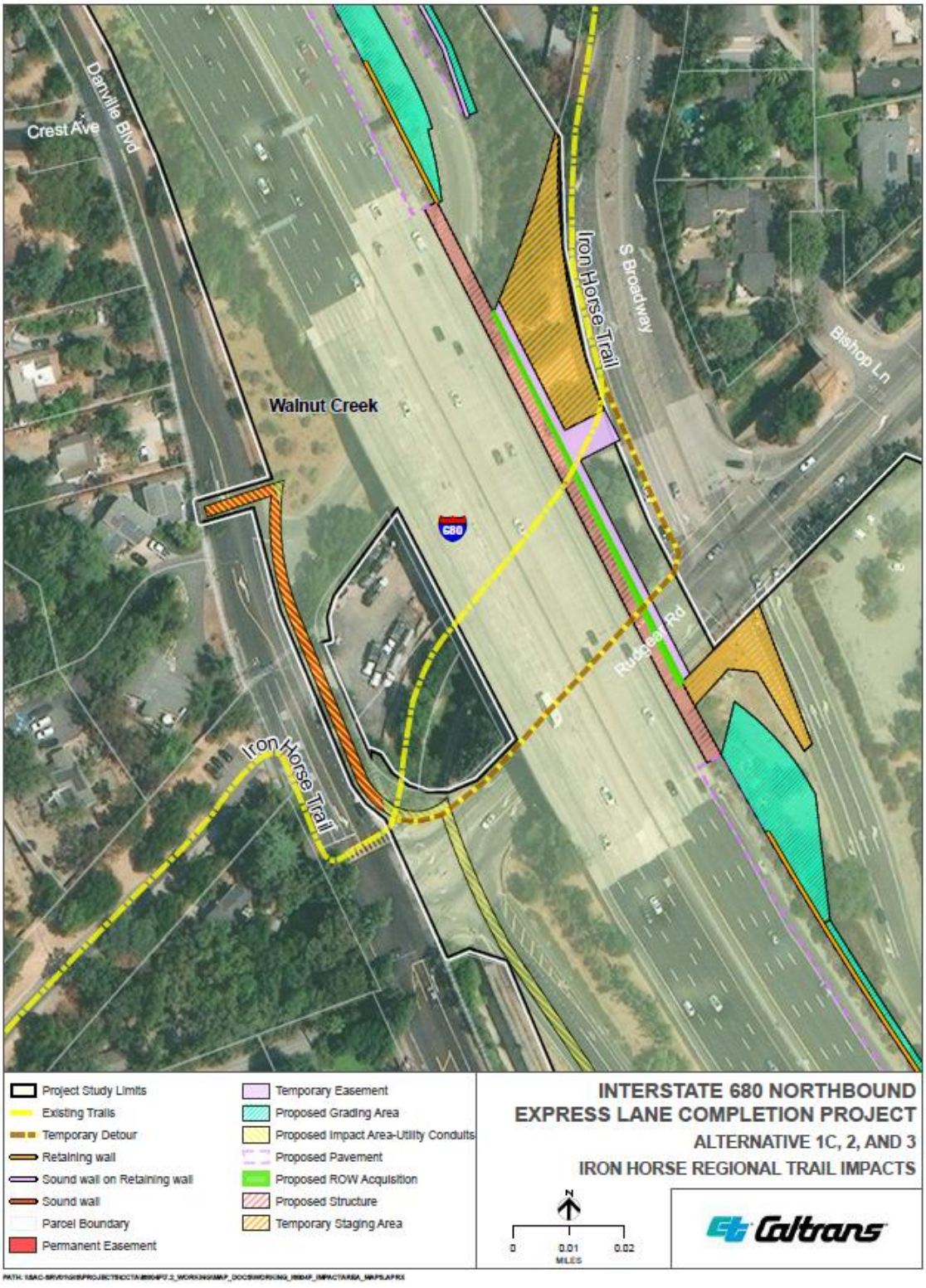


Figure 2.1.3-2. Alternatives 1C, 2, and 3: Iron Horse Regional Trail at Rudgear Road Undercrossing with Proposed Bridge Widening and Potential Temporary Trail Detour

Contra Costa Canal Trail/Briones to Mount Diablo Regional Trail

The Contra Costa Canal Trail/Briones to Mount Diablo Regional Trail crosses under I-680 at the Contra Costa Canal Undercrossing Bridge. This segment of the trail is shared with the Briones to Mount Diablo Regional Trail. The East Bay Regional Park District is the official with jurisdiction over these trails.

As depicted in Figure 2.1.3-3, all Build Alternatives, except Alternative 1C, propose to widen and construct a soundwall (Evaluated Barrier 2) on the Contra Costa Canal Undercrossing Bridge. Evaluated Barrier 2 is further described in Section 2.2.7, *Noise and Vibration*.

Widening the Contra Costa Canal Undercrossing would require temporarily closing the trail under I-680 for approximately 2 to 3 weeks during construction. Measure PR-1 would be implemented, which requires coordination with EBRPD to identify potential detours for this segment of the Contra Costa Canal Trail/Briones to Mount Diablo Regional Trail. A potential location for a detour has been identified that would route users to Treat Boulevard/Geary Road. This approximately 1-mile detour is depicted in Figure 2.1.3-3. Users may also be detoured along Oak Road east of Jones Road.

There are no benches or other amenities at the Contra Costa Canal Undercrossing. Falsework would be installed to support bridge widening and prevent any debris from falling onto the public and canal water passing under falsework during the remainder of the bridge widening. In addition, Measure **PR-2** would be implemented, which requires temporary construction areas to be rehabilitated to a condition as good or better than that prior to construction. Therefore, with the implementation of Measures **PR-1** and **PR-2**, these potential temporary impacts to the trail would be minimized. None of the Build Alternatives would result in substantial temporary adverse direct or indirect impacts on the Contra Costa Canal Trail/Briones to Mount Diablo Regional Trail within the Community Impact Study Area.

Acalanes Ridge Open Space

Comments were received during the Draft EIR/EA public comment period regarding potential impacts on the Acalanes Ridge Open Space. As shown in Figure 2.1.3-1, the Acalanes Ridge Open Space is within the Community Impact Study Area but outside the Project Study Limits. None of the Build Alternatives would physically occupy the Acalanes Ridge Open Space. Alternatives 1C and 3 would realign the SR-24 Interchange and include work near the BART overcrossing abutment downhill from the open space. Alternatives 2 and 5 would not realign the SR-24 Interchange; the nearest improvement would be the installation of luminaire in the highway median near the BART overcrossing.



Figure 2.1.3-3. Alternatives 2, 3, and 5: Contra Costa Canal Trail at the Contra Costa Canal Undercrossing with Proposed Bridge Widening and Potential Temporary Trail Detour

2.1.3.4 Summary

*Alternative 2 has been selected as the preferred alternative. As described above, Alternative 2 would require a temporary detour (up to 4 weeks) and permanent shift of the Iron Horse Regional Trail at the Rudgear Road Undercrossing Bridge and a temporary detour (approximately 2 to 3 weeks) of the Contra Costa Canal Trail/Briones to Mount Diablo Regional Trail at the Contra Costa Canal Undercrossing Bridge. Measures **PR-1** through **PR-3** would be implemented. Public access to the impacted trails would be maintained at all times. Therefore, impacts would not be adverse.*

East Bay Parks has concurred that Alternative 2 would not result in a "use" of either the Iron Horse Regional Trail or the Contra Costa Canal Trail/Briones to Mount Diablo Regional Trail under Section 4(f) (see Appendix A).

2.1.3.5 Avoidance, Minimization, and/or Mitigation Measures

PR-1 **Temporary Detours for Recreation Trails.** Contra Costa Transportation Authority (CCTA) will require that recreation trails within the Study Area remain open to the public during construction. If a segment of a recreation trail must be closed, CCTA will work with the officials with jurisdiction and local agencies to identify detours and appropriate signage and flagging to minimize impacts to trail users. All temporary trails will have a minimum width in compliance with current Americans with Disability Act standards.

PR-2 **Temporary Construction Areas.** All temporary construction areas within or adjacent to recreation areas, including parks, trails, pathways, and/or other recreational facilities, will be restored to a condition as good or better than that of the property prior to construction. CCTA, along with the construction contractor, will work with affected agencies and the officials with jurisdiction to identify the necessary rehabilitation activities.

PR-3 **Iron Horse Regional Trail Relocation.** Caltrans and CCTA will work with the East Bay Regional Park District to identify a suitable location to shift the Iron Horse Regional Trail under the Rudgear Road Undercrossing Bridge. In addition, Caltrans will coordinate with the Contra Costa Flood and Water Conservation District, Contra Costa Water District, Contra Costa County Superintendent, and Kinder Morgan. CCTA will also assist the East Bay Regional Park District in acquiring any necessary ROW or easements for this segment of the trail.

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2.1.4 Growth

2.1.4.1 Regulatory Setting

The Council on Environmental Quality (CEQ) regulations, which established the steps necessary to comply with the National Environmental Policy Act (NEPA) of 1969, require evaluation of the potential environmental effects of all proposed federal activities and programs. This provision includes a requirement to examine indirect effects, which may occur in areas beyond the immediate influence of a proposed action and at some time in the future. The CEQ regulations (40 Code of Federal Regulations [CFR] 1508.8) refer to these consequences as indirect impacts. Indirect impacts may include changes in land use, economic vitality, and population density, which are all elements of growth.

The California Environmental Quality Act (CEQA) also requires the analysis of a project's potential to induce growth. The CEQA guidelines (Section 15126.2[d]) require that environmental documents "…discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment…"

2.1.4.2 Affected Environment

This following discussion is based on the proposed Project's *Community Impact Assessment* (HDR Engineering, Inc., 2023), which was completed in November 2023. The Community Impact Study Area is described in Section 2.1.1, *Existing and Future Land Use*.

The Community Impact Study Area for community impacts lies completely within Contra Costa County and passes through the Town of Danville and the Cities of Martinez, Concord, Pleasant Hill, Walnut Creek, Lafayette, and San Ramon. In addition, the Study Area includes the following Census Designated Places: Vine Hill, Mountain View, Pacheco, Contra Costa Center, Acalanes Ridge, Saranap, San Miguel, Castle Hill, and Alamo.

Plan Bay Area 2050 is the Bay Area's regional long-range plan adopted by Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG) (Associate of Bay Area Governments, Metropolitan Transportation Commission, 2021). According to *Plan Bay Area 2050*, by 2050 "best estimates suggest the Bay Area's population will rise from nearly 8 million to over 10 million residents and that the number of jobs within the nine counties will climb from 4 million to more than 5 million." Household growth within Contra Costa County is projected to increase by 12 percent from 2015 to 2050 (the Plan's horizon year). Meanwhile, job growth within Contra Costa County is projected to increase by 9 percent by 2050. According to the California Department of Finance Forecasts, Contra Costa County is expected to grow consistently by at least 1 percent each year.

Traffic counts were conducted along the corridor in 2019 (DKS Associates, 2023). By the Project's opening year (2027), traffic volumes are projected to grow by 11 to 18 percent in the morning peak period and by 2 to 12 percent in the afternoon peak period. By the Project's design year (2047), traffic volumes are projected to grow by 18 to 48 percent in the morning peak period and by 4 to 36 percent in the afternoon peak period. The projected average annual growth rates from 2019 to 2047 for all segments combined are 1.0 percent in the morning peak period and 0.6 percent in the afternoon peak period. Recurrent traffic bottlenecks are sections along a freeway corridor where traffic demand exceeds the freeway's capacity and, as a result, cause traffic queueing (i.e., congestion) and delays to motorists approaching the bottleneck sections. Bottlenecks would continue to worsen along Interstate 680 (I-680) as described further in Section 2.1.8, *Traffic and Transportation/Pedestrian and Bicycle Facilities*.

2.1.4.3 Environmental Consequences

No-Build Alternative

The No-Build Alternative would maintain the current configurations of I-680 in the Community Impact Study Area. Under the No-Build Alternative, the proposed Project would not be constructed, and no impacts on growth would occur.

Build Alternatives (Alternatives 1C, 2, 3, and 5)

The California Department of Transportation (Caltrans) has developed guidance for determining whether a project is considered to be growth-inducing, both directly and indirectly. Based on a first-cut screening, it was determined that there is no potential for growth-related effects, and no further analysis is required. The results of the first-cut screening are described herein.

Alternatives 1C, 2, and 3 would increase capacity to northbound I-680 by adding a new lane south of State Route (SR) 242 and by converting an existing high-occupancy vehicle (HOV) lane north of SR-242 to an express lane. Alternative 1C, 2, and 3 also show higher vehicle-miles travelled (VMT) compared to the No-Build Alternative, due to additional capacity and the resulting increase in demand, as well as longer average trip lengths (DKS Associates, 2023). Although Alternative 5 would also add capacity to northbound I-680 by converting an existing HOV lane north of SR-242 to an express lane, it would reduce capacity to northbound I-680 south of SR-242 by converting a general-purpose lane to an express lane. Therefore, Caltrans determined that Alternative 5 would not increase capacity overall.

All Build Alternatives would provide substantial travel time and speed benefits along northbound I-680 compared to the No-Build Alternative, which is described further in Section 2.1.8, *Traffic and Transportation/Pedestrian and Bicycle Facilities*. As travel times improve, some vehicles are anticipated to shift to I-680 from local roadways that are currently used to avoid congestion on I-680. While no alternative fully eliminates bottlenecks and associated queuing, all Build Alternatives substantially lessen the impacts associated with bottlenecks north of SR-24, which can be seen between El

Pintado Road and SR-24. Therefore, all Build Alternatives would improve the existing highway facility (i.e., I-680) without altering access to or from this facility. None of the Build Alternatives would provide a new transportation facility or new access points. All Build Alternatives would facilitate improved mobility through reduced congestion and improved trip reliability, resulting in improved commute times for I-680 corridor users. The improvements in accessibility are not substantial and are not expected to influence travel behavior, trip patterns, or the attractiveness of some areas to development over others.

All Build Alternatives would also help to accommodate projected future (2047) traffic volumes, consistent with adopted local land use and transportation plans (as discussed in Section 2.1.2, *Consistency with State, Regional, and Local Plans*). The Build Alternatives would address existing operational and capacity deficiencies and would not foster growth in excess of what is projected per MTC and general plans. The Build Alternatives would not be expected to influence the amount, location, and/or distribution of growth in Contra Costa County because no new interchanges are proposed and much of the Study Area is built out. Some ramps or interchanges would be reconfigured to accommodate current and future traffic congestion. It is not anticipated that the proposed Project would induce land development because there are very few open areas available in the vicinity of the Study Area, and the Build Alternatives would not create new housing or opportunities for capital investment by the public or private sectors.

As noted above, the Build Alternatives would not result in proposed Project-related growth or influence growth. This "first-cut screening" analysis provided in the *Community Impact Assessment* demonstrates that the Build Alternatives would not change access but would instead facilitate improved mobility through reduced congestion and trip reliability, resulting in improved commute times for I-680 corridor users. The Build Alternatives would not influence the rate, type, or amount of growth that would otherwise occur. Therefore, the reasonably foreseeable growth anticipated to occur in the Study Area is not considered project related.

2.1.4.4 Summary

Alternative 2 has been selected as the preferred alternative. As described above, Alternative 2 would not induce growth. No avoidance, minimization, or mitigation is required. Therefore, impacts on growth would not be adverse.

2.1.4.5 Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, or mitigation is required.

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2.1.5 Community Character and Cohesion

2.1.5.1 Regulatory Setting

The National Environmental Policy Act (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 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. 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.

Under the California Environmental Quality Act (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.

2.1.5.2 Affected Environment

This following discussion is based on the proposed Project's *Community Impact Assessment* (HDR Engineering, Inc., 2023), which was completed in November 2023.

The Community Impact Study Area is described in Section 2.1.1, *Existing and Future Land Use*. Community or neighborhood boundaries can often be delineated by physical barriers (highways, waterways, open spaces, etc.), activity centers, home values, selected demographic characteristics (ethnic groups), and residents' perception.

This section addresses potential impacts on community character and cohesion within the Community Impact Study Area. Community character consists of all the attributes that make a community unique and establish a sense of place for its residents, including population demographics, economic and social history, importance of various facilities, and plans for the future.

Community cohesion is the degree to which residents have a sense of belonging to their neighborhood, their level of commitment to the community, or a strong attachment to neighbors, groups, and institutions, usually as a result of continued association over time. Community cohesion also refers to the degree of interaction among the individuals, groups, and institutions that make up a community.

Some factors that can influence a community's sense of belonging or level of commitment include housing, household size, household tenure, race and ethnicity, age, transit-dependent populations, and parks and recreational facilities. As described

below, according to several indicators of community cohesion, including high homeownership and occupancy rates and a high percentage of persons aged 65 and older, it can be concluded that a high degree of community cohesion exists in many parts of the Community Impact Study Area.

Population Characteristics

Between 2000 and 2020, the overall population of Contra Costa County grew more than 20 percent (see Table 2.1.5-1). Over the same period, the number of housing units and jobs in the county increased by more than 20 percent.

Table 2.1.5-1. Contra Costa County Demographic Trends

	2000	2010	2020	Percent Growth 2000–2010 (%)	Percent Growth 2010–2020 (%)
Population	948,816	1,024,809	1,147,788	8.0	12.0
Housing Units	344,219	396,782	415,067	15.3	4.6
Jobs	451,357	482,898	563,813	7.0	16.8

Sources: (U.S. Census Bureau, 2000a); (U.S. Census Bureau, 2000b); (U.S. Census Bureau, 2010a); (U.S. Census Bureau, 2010b); (U.S. Census Bureau, 2020a); (U.S. Census Bureau, 2020b)

Despite the positive trends in Contra Costa County, the Community Impact Study Area experienced a decrease in population from 2010 to 2020, recording a 2 percent decrease in the average annual growth rate in the last decade (see Table 2.1.5-2). The Contra Costa Centre census designated place (CDP), which is located just north of the Interstate 680 (I-680)/State Route (SR) 24 Interchange, has the highest population growth (26.9 percent) from 2010 to 2020 within the entire Community Impact Study Area. No other geography analyzed in the Study Area exceeds a 20 percent increase in population within the same period.

According to the *Plan Bay Area 2050*, between 2020 and 2050, best estimates suggest the Bay Area's population will grow from nearly 8 million to over 10 million residents, reflecting a 25 percent increase (Metropolitan Transportation Commission and Association of Bay Area Governments, 2021). According to California Department of Finance forecasts, Contra Costa County is expected to grow by at least 1 percent each year (California Department of Finance, 2019).

Table 2.1.5-2. Population Trends in the Community Impact Study Area

Geography	2010 Population	2020 Population	Percent Growth 2010–2020 (%)
Study Area	*206,532*	*202,429*	*-2.0*
Contra Costa County	*1,049,025*	*1,165,927*	*11.1*
Acalanes Ridge CDP	1,137	1,285	13.0
Alamo CDP	14,570	15,314	5.1
Castle Hill CDP	1,299	1,271	-2.2
Concord city	122,067	125,410	2.7
Contra Costa Centre CDP	5,364	6,808	26.9
Danville town	42,039	43,582	3.7
Lafayette city	23,893	25,391	6.3
Martinez city	35,824	37,287	4.1
Mountain View CDP	2,372	2,622	10.5
Pacheco CDP	3,685	4,183	13.5
Pleasant Hill city	33,152	34,613	4.4
San Miguel CDP	3,392	3,591	5.9
San Ramon city	72,148	84,605	17.3
Saranap CDP	5,202	5,830	12.1
Vine Hill CDP	3,761	4,323	14.9
Walnut Creek city	64,173	70,127	9.3

Sources: (U.S. Census Bureau, 2010c); (U.S. Census Bureau, 2020c)
Notes: CDP=census designated place

Economic Conditions

Regional Economy

Contra Costa County's economic conditions were reviewed to understand the region's economic outlook and the Community Impact Study Area's position in the overall economy. According to the *Contra Costa County Economic Forecast*, Contra Costa County's population is expected to grow faster from 2021 to 2050 than the Bay Area average (Caltrans Department of Transportation, 2021). It is anticipated that the County lost residents through the migratory process in 2021 and 2022. Over the long term, it is likely that net migration would turn positive because homes in Contra Costa County are

much more affordable than those in other parts of the Bay Area. Additionally, more housing projects were recently approved in the cities of Concord and Antioch, and they will soon be under development.

Between 2021 and 2050, job growth in Contra Costa County is anticipated to be similar to that of the Bay Area average. According to the *Contra Costa County Economic Forecast*, the largest employment gains in 2021 were forecasted to be in leisure services, professional business services, private education, healthcare, and retail trade. In 2021, total employment in Contra Costa County was forecasted to expand by 5.8 percent annually.

Employment and Income

The employment status of Contra Costa County residents is shown in Table 2.1.5-3. The communities with the highest unemployment rates are the Mountain View CDP (7 percent) and Acalanes Ridge CDP (6.7 percent). Meanwhile, the communities with the lowest unemployment rates are the Saranap CDP (1.2 percent) and the Alamo CDP (1.6 percent).

Table 2.1.5-3. Employment Status

Jurisdiction	Population 16 Years and Over	Percent Unemployed (%)	Percent Not in Labor Force (%)
Contra Costa County	*918,776*	*3.6*	*35.0*
Acalanes Ridge CDP	654	6.7	33.2
Alamo CDP	11,412	1.6	47.2
Castle Hill CDP	816	2.7	19.1
Concord city	103,783	3.2	32.5
Contra Costa Centre CDP	6,070	2.8	21.3
Danville town	35,727	2.5	36.0
Lafayette city	20,109	2.7	36.1
Martinez city	31,341	3.1	31.6
Mountain View CDP	1,518	7.0	18.4
Pacheco CDP	4,174	4.1	28.9
Pleasant Hill city	28,897	2.3	34.4
San Miguel CDP (Contra Costa County)	2,607	2.3	39.5
San Ramon city	61,603	3.0	30.9
Saranap CDP	4,822	1.2	33.4

Jurisdiction	Population 16 Years and Over	Percent Unemployed (%)	Percent Not in Labor Force (%)
Vine Hill CDP	2,458	2.6	28.5
Walnut Creek city	60,334	2.9	42.6

Source: (U.S. Census Bureau, 2020b)
Notes: CDP = census designated place

According to the U.S. Census Bureau (U.S. Census Bureau, 2020d), most of the employed civilian population in Contra Costa County was employed in the educational, health, and social assistance sectors (22.2 percent). Most of the cities located within the Community Impact Study Area followed a similar trend, with the highest percentage of the employed population working in the educational, health, and social assistance sectors. Martinez was the highest, at 25.4 percent. However, the Acalanes Ridge CDP and Contra Costa Centre CDP had the highest percentage of their populations working in the professional and technical services (29.9 percent and 28.3 percent, respectively). The Alamo CDP and San Ramon had the highest percentages of manufacturing jobs (11.3 percent and 11.2 percent, respectively). San Ramon had the lowest percentage of construction workers (2.7 percent), and the Acalanes Ridge CDP and Saranap CDP had the lowest percentage of manufacturing jobs (both at 4.0 percent).

Business Activity

Many of the businesses adjacent to the Project Study Limits and within the Community Impact Study Area rely on visibility from and access to I-680. Most of the businesses and commercial office spaces within the Community Impact Study Area are located adjacent to I-680 and are largely considered visitor-serving, such as motels and hotels, fast-food restaurants, and gasoline service stations. Major employers within the Community Impact Study Area include the Chevron Corporation, Contra Costa Regional Medical Center, Longs Drug Store, Nordstrom, and Shell Oil Production US Martinez. In addition, large commercial shopping centers that serve visitors and residents are located throughout the proposed Project corridor.

Fiscal Considerations

This section discusses property tax revenue, property value, and sales tax revenues for the affected proposed Project area.

Property Tax Revenue

Property taxes are levied on the assessed value of a privately owned property. The following property tax revenues were collected from each respective jurisdiction's annual comprehensive financial reports for fiscal year 2020–2021 (HDR Engineering, Inc., 2023):

- City of Martinez: $9.97 million
- City of Concord: $24.1 million
- City of Pleasant Hill: $8.3 million
- City of Lafayette: $5.77 million
- City of Walnut Creek: $27.7 million
- Town of Danville: $17.21 million
- City of San Ramon: $21.86 million

Property Values

Residential property value is the amount at which a property is assessed for taxation (i.e., assessed value) and the value at which the property can be sold on the open real estate market (i.e., market value). Property value reflects the desirability of a particular property with regard to aesthetic qualities, accessibility, safety, and many other factors.

Figure 2.1.5-1 displays typical market value data from 2000 to 2022, according to the Zillow Home Value Index published by Zillow, a technology real estate marketplace company (Zillow Research, 2011).

The evaluated period depicted in Figure 2.1.5-1 is from 2000 to 2022, with the caveat that 2022 data is only captured through September 2022. The typical home values for properties in the Community Impact Study Area show that Alamo has the highest typical home value ($2,750,822 in 2022) while Concord has the lowest ($621,620 in 2022). The growth rate in typical home value within the Study Area (except Alamo, Danville, and San Ramon) has slowed since 2020. As shown in Figure 2.1.5-1, the typical home value in the Pleasant Hill used to be higher than Walnut Creek before 2010. After 2010, the value of homes in Walnut Creek increased at a faster rate than Pleasant Hill, and the gap between home values continued to widen. Similarly, the typical home value in Lafayette used to be higher than the San Ramon before 2020. After 2020, the value of homes in San Ramon grew at a faster rate than Lafayette, and the gap between home values in the two cities have widened ever since.

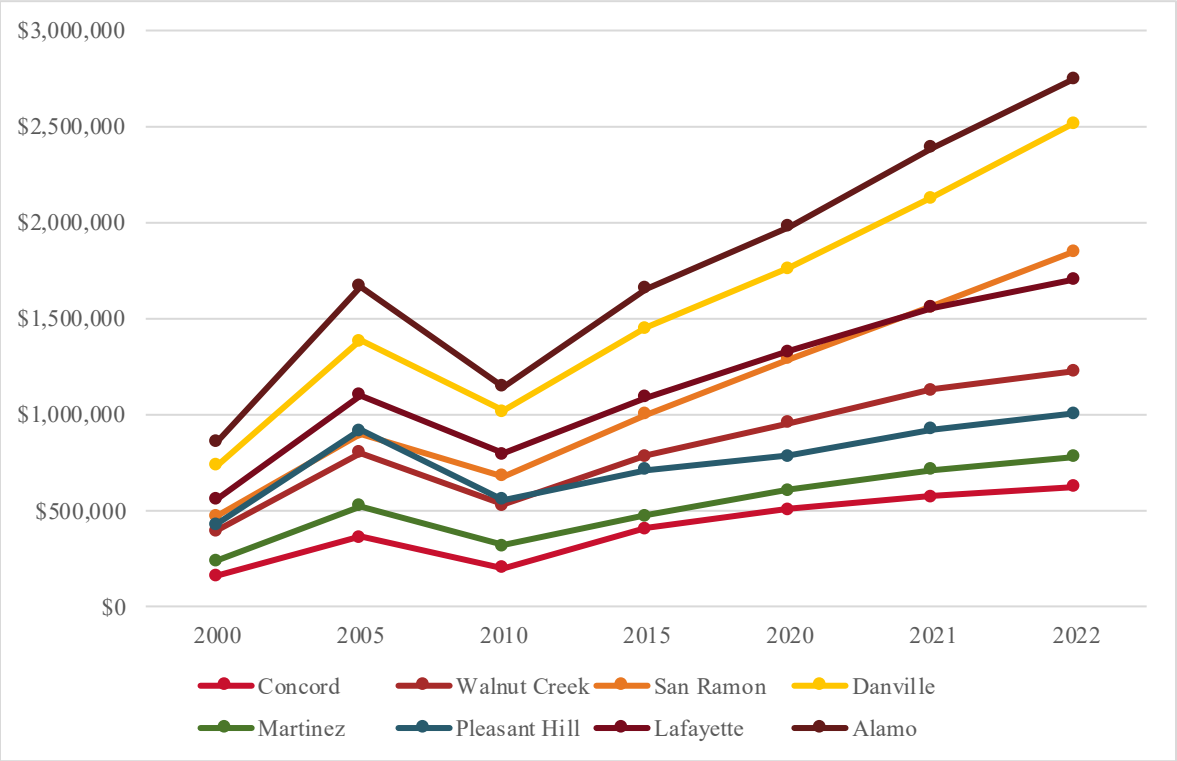


Figure 2.1.5-1. Typical Home Value for Properties in the Community Impact Study Area

More homes within Contra Costa County are expected to be built from 2021 to 2050 than were built in the 5 years prior to 2021. Home prices surged unexpectedly in 2020, rising by 13 percent. Prices were expected to increase by another 7 or 8 percent in 2021.

Sales Tax Revenue

Many of the businesses in the Community Impact Study Area generate sales tax revenues for the affected cities. Retail sales-oriented businesses generate sales tax by means of selling taxable goods. Sales tax revenues are collected at a rate of 8.25 percent for the affected jurisdictions in Contra Costa County, with higher rates for the following affected jurisdictions:

- City of Martinez: 9.25 percent
- City of Concord: 8.75 percent
- City of Pleasant Hill: 8.75 percent

The following sales tax revenue information was collected from each respective jurisdiction's annual comprehensive financial reports for fiscal year 2020–2021 (HDR Engineering, Inc., 2023):

- City of Martinez: $13.33 million
- City of Concord: $40.3 million
- City of Pleasant Hill: $10.6 million
- City of Lafayette: $2.85 million
- City of Walnut Creek: $30.9 million
- Town of Danville: $6.65 million
- City of San Ramon: $10.77 million

The cities of Walnut Creek and Concord collected the most in sales tax revenue among the Community Impact Study Area jurisdictions in fiscal year 2020–2021. This is attributed primarily to their large-scale retail establishments within the Community Impact Resource Study Area, including Broadway Plaza in Walnut Creek and Sunvalley Shopping Center and the Veranda in Concord. The two cities also have strong and vibrant downtowns that are home to many local business and restaurants.

Housing

According to Contra Costa County's latest housing element (Contra Costa County, 2023), the draft of which was published in January 2023, the predominant housing type in the county is single-family housing at approximately 79.7 percent; with a growing number of transit-oriented, multi-family, village developments at approximately 15.9 percent; and the remainder being mobile homes at approximately 4.4 percent.

Table 2.1.5-4 provides the breakdown of future regional needs by income for all incorporated and unincorporated areas of Contra Costa County. Over the Association of Bay Area Governments (ABAG) 2023–2031 Regional Housing Needs Allocation (RHNA) period, the total housing needed for Contra Costa County was determined to be 49,043 new units (Association of Bay Area Governments, 2022).

Table 2.1.5-4. Regional Housing Needs Allocations within Contra Costa County

Jurisdiction	Very Low Income (<50% of Area Median Income)	Low Income (50-80% of Area Median Income)	Moderate Income (80-120% of Area Median Income)	Above Moderate Income (>120% of Area Median Income)	Total
Antioch	792	456	493	1,275	3,016
Brentwood	402	232	247	641	1,522
Clayton	170	97	84	219	570

Jurisdiction	Very Low Income (<50% of Area Median Income)	Low Income (50-80% of Area Median Income)	Moderate Income (80-120% of Area Median Income)	Above Moderate Income (>120% of Area Median Income)	Total
Concord	1,292	744	847	2,190	5,073
Danville	652	376	338	875	2,241
El Cerrito	334	192	241	624	1,391
Hercules	344	198	126	327	995
Lafayette	599	344	326	845	2,114
Martinez	350	201	221	573	1,345
Moraga	318	183	172	445	1,118
Oakley	279	161	172	446	1,058
Orinda	372	215	215	557	1,359
Pinole	121	69	87	223	500
Pittsburg	516	296	346	894	2,052
Pleasant Hill	566	326	254	657	1,803
Richmond	840	485	638	1,651	3,614
San Pablo	173	100	132	341	746
San Ramon	1,497	862	767	1,985	5,111
Unincorporated Contra Costa	2,072	1,194	1,211	3,133	7,610
Walnut Creek	1,657	954	890	2,304	5,805
Total (Contra Costa County)	*13,346*	*7,685*	*7,807*	*20,205*	*49,043*

Source: (Association of Bay Area Governments, 2022)
Notes: % = percent

Due to the County's low vacancy rate and the growing demand for housing due to population growth, the County faces a high demand for housing at all income levels. The housing needs allocation varies from a low of 500 new units in Pinole to a high of 5,805 new units in Walnut Creek, as well as 7,610 new units in unincorporated Contra Costa County. Other communities that will absorb much of the region's projected future housing growth are the cities of Concord (5,073) and San Ramon (5,111), which are within the Community Impact Study Area.

Housing production in Contra Costa County is constrained by geography and topology, growth management policies, and development costs. Nonetheless, as part of the County's RHNA 2023–2031 update (Contra Costa County, 2023), the County performed

a detailed parcel-by-parcel analysis of potential development sites. This analysis is summarized in Table 2.1.5-5. Of the communities with the highest potential number of units, the unincorporated areas of Walnut Creek within the Community Impact Study Area have the third greatest potential number of units to be added to its housing stock (978 units).

Table 2.1.5-5. Vacant and Underutilized Residential Sites Analysis within Contra Costa County

Community	Total Number of Parcels	Potential Number of Units
Alamo	15	335
Bay Point	142	2,963
Bay View	5	969
Byron	2	184
Clyde	1	1
Contra Costa Center	6	458
Crockett	17	21
Discovery Bay	4	494
East Richmond Height	5	50
El Sobrante	103	1,180
Montalvin Manor	3	240
North Richmond	134	544
Pacheco	7	113
Pleasant Hill (unincorporated)	2	8
Reliez Valley	1	1
Rodeo	26	250
San Pablo	1	18
Saranap	1	1
Tara Hills	2	20
Vine Hill	30	430
Walnut Creek (unincorporated)	22	978
Total (Contra Costa County)	*529*	*9,258*

Source: (Contra Costa County, 2023)

Household Size

Table 2.1.5-6 shows the average household sizes for communities in the Community Impact Study Area for 2016–2020. Average household sizes range from 1.84 persons per household in the Contra Costa Centre CDP to 2.95 in San Ramon. The average household size within the Community Impact Study Area is 2.54, indicating a higher degree of community cohesion.

Table 2.1.5-6. Average Household Sizes and Overcrowding in the Community Impact Study Area

Geography	Average Household Size	Percent Single Person Households (%)	Overcrowded Units[1]	Percent Overcrowded (%)
Study Area	*2.54*	*26*	*3,350*	*4.2*
Contra Costa County	*2.86*	*22*	*19,927*	*5.0*
Acalanes Ridge CDP	2.51	2	0	0.0
Alamo CDP	2.92	13	0	0.0
Castle Hill CDP	2.83	14	0	0.0
Concord city	2.76	25	3,691	8.0
Contra Costa Centre CDP	1.84	40	156	4.3
Danville city	2.72	18	131	0.8
Lafayette city	2.73	17	91	1.0
Martinez city	2.55	25	303	2.0
Mountain View CDP	2.33	24	15	1.9
Pacheco CDP	2.66	21	127	7.1
Pleasant Hill city	2.51	28	241	1.8
San Miguel CDP	2.88	9	0	0.0
San Ramon city	2.95	17	877	3.2
Saranap CDP	2.55	27	37	1.6
Vine Hill CDP	2.84	15	44	3.9
Walnut Creek city	2.14	36	968	3.0

Geography	Average Household Size	Percent Single Person Households (%)	Overcrowded Units[1]	Percent Overcrowded (%)

Sources: (California Department of Housing and Community Development, 2023); (U.S. Census Bureau, 2020e); (U.S. Census Bureau, 2020f); (U.S. Census Bureau, 2020g)
Notes:
CDP=census designated place
[1] The U.S. Census defines an overcrowded unit as one occupied by 1.01 persons or more per room (excluding bathrooms and kitchens). Units with more than 1.5 persons per room are considered severely overcrowded.

Housing Tenure

As shown in Table 2.1.5-7, the communities in the Community Impact Study Area have a comparable percentage of owner-occupied and renter-occupied units to Contra Costa County averages. The Castle Hill CDP, Acalanes Ridge CDP, Alamo CDP, and San Miguel CDP all have the highest proportions of owner-occupied units, at over 90 percent. Occupancy rates are high, ranging from 89.4 percent in the Vine Hill CDP to 100 percent in the Acalanes CDP, Castle Hill CDP, and Pacheco CDP. The data indicate a high level of community cohesion due to high occupancy and high owner occupancy rates.

Table 2.1.5-7. Housing Tenure and Other Characteristics in the Community Impact Study Area

Geography	Total Housing Units	Occupied Housing Units	Percent Occupied (%)	Percent Owner Occupied (%)	Percent Moved in 1999 or Earlier (%)
Study Area	*82,732*	*79,714*	*96.4*	*61.6*	*26.4*
Contra Costa County	*415,067*	*398,299*	*96.0*	*66.8*	*25.3*
Acalanes Ridge CDP	348	348	100.0	95.4	51.1
Alamo CDP	5,074	4,734	93.3	93.1	41.4
Castle Hill CDP	410	410	100.0	96.6	41.0
Concord city	47,771	46,402	97.1	60.1	26.1
Contra Costa Centre CDP	3,635	3,618	99.5	20.1	12.0
Danville city	16,966	16,499	97.2	84.7	32.5

Geography	Total Housing Units	Occupied Housing Units	Percent Occupied (%)	Percent Owner Occupied (%)	Percent Moved in 1999 or Earlier (%)
Lafayette city	10,014	9,470	94.6	71.4	35.6
Martinez city	15,340	14,853	96.8	69.6	31.5
Mountain View CDP	804	786	97.8	64.4	20.5
Pacheco CDP	1,798	1,798	100.0	70.7	22.5
Pleasant Hill city	14,286	13,762	96.3	64.2	27.8
San Miguel CDP	1,183	1,127	95.3	94.1	56.8
San Ramon city	28,370	27,524	97.0	71.8	15.9
Saranap CDP	2,404	2,348	97.7	67.0	34.0
Vine Hill CDP	1,270	1,135	89.4	74.5	27.0
Walnut Creek city	33,689	32,163	95.5	63.9	25.9

Sources: (U.S. Census Bureau, 2020g); (U.S. Census Bureau, 2020h); (U.S. Census Bureau, 2020i)
Notes:
CDP=census designated place

Race and Ethnicity

Table 2.1.5-8 shows the race and ethnicity characteristics for communities in the Community Impact Study Area in 2020. Based on the 2020 Census data, the majority (57.7 percent) of the Community Impacts Resources Study Area is White alone, Non-Hispanic. The highest percentages of non-White populations were Hispanic or Latino and Asian. The percentage of Black individuals within the Study Area ranges from 0.6 percent in the San Miguel CDP to 4.8 percent in the Contra Costa Centre CDP. The area with the highest percentage of minority populations is in San Ramon (67.9 percent). Compared with the race and ethnicity population percentages in Contra Costa County as a whole, the Community Impact Study Area percentages show more homogeneity, which indicates a higher degree of cohesion in the community.

Table 2.1.5-8. Race and Ethnicity Characteristics in the Community Impact Study Area

Geography	Population	White alone, Non-Hispanic	Minority						
			Black Alone	Asian alone	American Indian / Native Alaskan	Hawaiian / Pacific Islanders	Other[1]	Hispanic or Latino	Minority Population
Study Area	*202,429*	*116,761 (57.7%)*	*4,753 (2.3%)*	*31,116 (15.4%)*	*359 (0.2%)*	*456 (0.2%)*	*13,860 (6.8%)*	*35,124 (17.4%)*	*85,668 (42.3%)*
Contra Costa County	*1,165,927*	*455,421 (39.1%)*	*97,997 (8.4%)*	*214,520 (18.4%)*	*2,553 (0.2%)*	*5,720 (0.5%)*	*74,816 (6.4%)*	*314,900 (27.0%)*	*710,506 (60.9%)*
Acalanes Ridge CDP	1,285	918 (71.4%)	9 (0.7%)	175 (13.6%)	1 (0.1%)	0 (0%)	75 (5.8%)	107 (8.3%)	367 (28.6%)
Alamo CDP	15,314	11,379 (74.3%)	114 (0.7%)	1,784 (11.6%)	16 (0.1%)	17 (0.1%)	889 (5.8%)	1,115 (7.3%)	03,935 (25.7%)
Castle Hill CDP	1,271	921 (72.5%)	9 (0.7%)	147 (11.6%)	0 (0%)	6 (0.5%)	97 (7.6%)	91 (7.2%)	350 (27.5%)
Concord city	125,410	54,104 (43.1%)	4,532 (3.6%)	18,435 (14.7%)	295 (0.2%)	644 (0.5%)	8,447 (6.7%)	38,953 (31.1%)	71,306 (56.9%)
Contra Costa Centre CDP	6,808	3,234 (47.5%)	329 (4.8%)	1,882 (26.8%)	15 (0.2%)	16 (0.2%)	559 (8.2%)	833 (12.2%)	3,574 (52.5%)
Danville town	43,582	29,819 (68.4%)	380 (0.9%)	6,540 (15.0%)	59 (0.1%)	42 (0.1%)	2,790 (6.4%)	3,952 (9.1%)	13,763 (31.6%)
Lafayette city	25,391	17,950 (70.7%)	170 (0.7%)	3,159 (12.4%)	27 (0.1%)	20 (0.1%)	1,993 (7.8%)	2,075 (8.2%)	7,441 (29.3%)

Geography	Population	White alone, Non-Hispanic	Minority						
			Black Alone	Asian alone	American Indian / Native Alaskan	Hawaiian / Pacific Islanders	Other[1]	Hispanic or Latino	Minority Population
Martinez city	37,287	22,558 (60.5%)	1,314 (3.5%)	3,746 (10.0%)	92 (0.2%)	106 (0.3%)	2,801 (7.5%)	6,670 (17.9%)	14,729 (39.5%)
Mountain View CDP	2,622	1,528 (58.3%)	65 (2.5%)	136 (5.2%)	22 (0.8%)	7 (0.3%)	195 (7.4%)	669 (25.5%)	1,094 (41.7%)
Pacheco CDP	4,183	1,996 (47.7%)	74 (1.8%)	470 (11.2%)	11 (0.3%)	15 (0.4%)	288 (6.9%)	1,329 (31.8%)	2,187 (52.3%)
Pleasant Hill city	34,613	20,716 (59.9%)	872 (2.5%)	5,241 (15.1%)	90 (0.3%)	102 (0.3%)	2,635 (7.6%)	4,957 (14.3%)	13,897 (40.1%)
San Miguel CDP	3,591	2,737 (76.2%)	23 (0.6%)	299 (8.3%)	1 (0.0%)	9 (0.3%)	234 (6.5%)	288 (8.0%)	854 (23.8%)
San Ramon city	84,605	27,140 (32.1%)	2,113 (2.5)	43,052 (50.9%)	100 (0.1%)	174 (0.2%)	4,924 (5.9%)	7,102 (8.4%)	57,465 (67.9%)
Saranap CDP	5,830	4,011 (68.8%)	86 (1.5%)	633 (10.9%)	7 (0.1%)	7 (0.1%)	463 (7.9%)	623 (10.7%)	1,819 (31.2%)
Vine Hill CDP	4,323	1,954 (45.2%)	140 (3.2%)	473 (10.9%)	26 (0.6%)	27 (0.6%)	368 (8.5%)	1,335 (30.9%)	2,369 (54.8%)
Walnut Creek city	70,127	44,922 (64.1%)	1,477 (2.1%)	11,538 (16.5%)	81 (0.1%)	103 (0.1%)	4,702 (6.7%)	7,304 (10.4%)	25,205 (35.9%)

Source: (U.S. Census Bureau, 2020j)
Notes:
CDP=census designated place; % = percent
[1] Other includes those identified as Other Pacific Islander, Some Other Race, or Two or More Races

Age

Table 2.1.5-9 shows the median age for communities in the Community Impact Study Area for 2016–2020. The Community Impact Study Area has a median age of 41.9 years, which is slightly higher than the median age of Contra Costa County (39.9 years). The Community Impact Study Area also has a percentage of the population over 65 (20.1 percent) that is higher than Contra Costa County (15.8 percent). Walnut Creek and the Acalanes Ridge CDP have more than a quarter of their populations over the age of 65, which may indicate a higher degree of cohesion in these communities.

Table 2.1.5-9. Median Age in the Community Impact Study Area

Geography	Median Age (Years) [a]	Percent over 65 (%) [b]
Study Area	*41.9*	*20.1*
Contra Costa County	*39.9*	*15.8*
Acalanes Ridge CDP	45.6	27.1
Alamo CDP	49.2	23.5
Castle Hill CDP	45.1	15.1
Concord city	38.1	14.8
Contra Costa Centre CDP	32.0	7.9
Danville city	46.6	18.8
Lafayette city	45.5	19.0
Martinez city	42.2	16.4
Mountain View CDP	35.7	6.6
Pacheco CDP	41.3	14.8
Pleasant Hill city	42.2	16.5
San Miguel CDP (Contra Costa County)	49.6	24.3
San Ramon city	40.8	11.2
Saranap CDP	44.6	20.6
Vine Hill CDP	35.1	7.3
Walnut Creek city	48.3	30.4

Sources: (U.S. Census Bureau, 2020k); (U.S. Census Bureau, 2020l)
Notes:
CDP=census designated place

Transit-Dependent Populations

The availability and convenience of transit services is especially important for transit dependent populations, which include zero-vehicle households or those who take transit or walk to work on a regular basis rather than driving. Residents who use public transportation more frequently or walk for travel tend to correlate with a higher degree of community cohesion.

Table 2.1.5-10 shows the mode choice for workers, as well as the numbers and percentages of households without a vehicle (therefore, transit-dependent) within the Community Impact Study Area. As shown in Table 2.1.5-10, the percentage of zero-vehicle households ranges from 2 percent (Vine Hill CDP and Saranap CDP) to 11.6 percent (Contra Costa Centre CDP). The Contra Costa Centre CDP also has the highest percentage (42.9 percent) of residents that use transit to commute or walk to work, which suggests a higher degree of cohesion in this community compared to the rest of the Community Impact Study Area. Overall, the Community Impact Study Area is made up of approximately 6.5 percent of zero-vehicle households and approximately 12 percent that use transit, which is around the average among all evaluated communities within the proposed Project Study Limits.

Table 2.1.5-10. Mode Choice and Transit-Dependent Populations

Geography	Total Households	Zero Vehicle Households	Total Workers	Driving	Transit	Walk	Other[1]
Study Area	79,714	5,161 (6.5%)	102,695	72,639 (70.7%)	12,185 (11.9%)	2,815 (2.7%)	15,056 (14.7%)
Contra Costa County	398,299	21,003 (5.3%)	547,220	418,076 (76.4%)	56,364 (10.3%)	8756 (1.6%)	64,025 (11.7%)
Acalanes Ridge CDP	348	-	393	296 (75.3%)	40 (10.2%)	-	57 (14.5%)
Alamo CDP	4,734	151 (3.2%)	5,742	4,192 (73.0%)	379 (6.6%)	34 (0.6%)	1,137 (19.8%)
Castle Hill CDP	410	17 (4.1%)	621	328 (52.8%)	99 (15.9%)	-	194 (31.3%)
Concord city	46,402	2,891 (6.2%)	64,787	49,692 (76.7%)	7,191 (11.1%)	1,361 (2.1%)	6,543 (10.1%)
Contra Costa Centre CDP	3,618	420 (11.6%)	4,526	2,010 (44.4%)	1,869 (41.3%)	72 (1.6%)	575 (12.7%)
Danville city	16,499	695 (4.2%)	21,364	15,873 (74.3%)	1,004 (4.7%)	470 (2.2%)	4,016 (18.8%)

Geography	Total Households	Zero Vehicle Households	Total Workers	Driving	Transit	Walk	Other[1]
Lafayette city	9,470	336 (3.5%)	12,012	7,339 (61.1%)	1,874 (15.6%)	180 (1.5%)	2,619 (21.8%)
Martinez city	14,853	537 (3.6%)	19,886	15,988 (80.4%)	1,293 (6.5%)	398 (2%)	2,207 (11.1%)
Mountain View CDP	786	-	1,115	889 (79.7%)	186 (16.7%)	8 (0.7%)	32 (2.9%)
Pacheco CDP	1,798	86 (4.8%)	2,745	2,407 (87.7%)	22 (0.8%)	77 (2.8%)	239 (8.7%)
Pleasant Hill city	13,762	897 (6.5%)	17,994	13,064 (72.6%)	2,375 (13.2%)	396 (2.2%)	2,159 (12%)
San Miguel CDP	1,127	-	1,458	870 (59.7%)	217 (14.9%)	47 (3.2%)	324 (22.2%)
San Ramon city	27,524	949 (3.4%)	40,029	29,982 (74.9%)	3,362 (8.4%)	320 (0.8%)	6,365 (15.9%)
Saranap CDP	2,348	47 (2%)	3,080	2,202 (71.5%)	434 (14.1%)	15 (0.5%)	428 (13.9%)
Vine Hill CDP	1,135	23 (2%)	1,648	1,513 (91.8%)	69 (4.2%)	-	66 (4%)
Walnut Creek city	32,163	2,662 (8.3%)	32,097	19,868 (61.9%)	5,553 (17.3%)	1,027 (3.2%)	5,649 (17.6%)

Sources: (U.S. Census Bureau, 2020m); (U.S. Census Bureau, 2020n)
Notes: CDP = Census Designated Place; % = percent
[1] The "Other" category includes residents who commute by taxi, those who commute by motorcycle, and those who work from home.

Parks and Recreational Facilities

As discussed in Section 2.1.3, *Parks and Recreational Facilities*, several local parks and recreational facilities serve Contra Costa County along I-680. The Community Impact Study Area includes 28 public parks; 5 recreation areas; 1 wildlife or waterfowl refuge; 30 existing bike, pedestrian, and equestrian paths; and 22 public schools with recreation areas. This high number of parks and recreational facilities in the Community Impact Study Area, including multiple trails with good connectivity to other trails, parks, and communities, indicates a higher degree of cohesion in the community.

2.1.5.3 Environmental Consequences

No-Build Alternative

The No-Build Alternative would maintain the current configurations of I-680 in the Community Impact Study Area. Under the No-Build Alternative, the proposed Project would not be constructed, and no direct impacts on community character or cohesion would occur. Potential indirect impacts to the neighborhoods, communities and community character, and regional economy could result from the continued decrease in traffic flow and capacity associated with congested roadways, such as I-680, and the lack of alternative commute choices.

Build Alternatives (Alternatives 1C, 2, 3, and 5)

Population and Housing

None of the Build Alternatives would require a permanent full acquisition of any parcel or otherwise result in the permanent relocation or displacement of any person or business. Although the Build Alternatives would result in increased short-term local employment and business activity during construction, no permanent employment or increase in business activity is anticipated as a result of construction activities. Therefore, proposed construction activities are not anticipated to permanently affect long-term population levels or housing within the Community Impact Study Area.

Alternatives 1C, 2, and 3 would permanently add capacity to northbound I-680. Alternative 5 would not permanently add capacity to I-680. As described in Section 2.1.4, *Growth*, the increased capacity on northbound I-680 proposed by Alternatives 1C, 2, and 3 would not be expected to encourage more people or employers to relocate to Contra Costa County. The proposed Project is being designed to ease congestion along northbound I-680 and accommodate planned growth in the Community Impact Study Area.

In addition, the Build Alternatives should result in little to no impact on property values, because the proposed Project would be constructed largely within existing State right-of-way (ROW). None of the Build Alternatives would result in any permanent full acquisitions; only temporary construction easements, permanent utility easements, and partial acquisitions are required, which are fairly minor in scope. None of the partial acquisitions would change the use of any existing structure. In accordance with **CIA-2**, all property owners would be treated in accordance with the Uniform Relocation Act and Real Property Acquisition Policies Act of 1970 (49 CFR Part 24), which allows for the uniform, fair, and equitable treatment of persons and agencies whose real property is acquired in connection with federally funded projects. Caltrans and the Contra Costa Transportation Authority (CCTA) would also work with the City of Walnut Creek to minimize and avoid impacts on operations at the City of Walnut Creek's Corporation Yard (511 Lawrence Way) during final design (**CIA-3**).

Although the Build Alternatives would reduce congestion and potentially shift some traffic onto northbound I-680, the Build Alternatives are not anticipated to alter employment or housing substantially. Therefore, none of the Build Alternatives would impact existing or forecasted population levels or housing substantially, either directly or indirectly, within the Community Impact Study Area.

Neighborhoods/Communities/Community Character

Implementation of the Build Alternatives would result in several new structures associated with new bridge overcrossings, noise barriers, retaining walls, drainage systems, electronic toll collection equipment, and overhead sign structures, none of which would divide or introduce a new physical barrier to the communities and neighborhoods in the Study Area. The communities and neighborhoods in the Community Impact Study Area are already divided by a multi-lane highway; therefore, the addition of the structures described above would not further divide any communities or neighborhoods. Construction activities are temporary and are not anticipated to divide existing communities or change community character. For more information regarding short-term visual, air quality, and noise impacts from construction activities, see Section 2.1.9, *Visual/Aesthetics*; Section 2.2.6, *Air Quality*; and Section 2.27, *Noise*, respectively.

The Community Impact Study Area would not experience a direct disruption in community character or cohesion from the activities proposed under the Build Alternatives because the Build Alternatives do not involve construction of a new roadway; all improvements are along existing roadways. None of the partial acquisitions would change the use of any existing structure and all property owners would be treated in accordance with the Uniform Relocation Act and Real Property Acquisition Policies Act of 1970 (**CIA-2**).

The Build Alternative would benefit the neighborhoods and communities in the Community Impact Study Area by reducing congestion and travel time. The improvements, especially the extended express lane, would provide a more efficient connection between the northern and southern sides of the Study Area, which could help to further link these communities together, increasing community cohesion for the area.

None of the Build Alternatives would result in the permanent or temporary relocation or displacement of any resident or business. In addition, none of the Build Alternatives would impact any special groups—such as the elderly, persons with disabilities, or racial, ethnic, or religious groups within a neighborhood—or negatively affect the perceived quality of life in the neighborhood. Full freeway closures would only occur overnight during the construction period. No ramp closures would extend longer than 12 months under any of the Build Alternatives, and Alternative 2 (preferred alternative) would have only one long-term ramp closure (i.e., 1-month closure at northbound North Main Street off-ramp). Property access would be maintained throughout Project

construction. Implementation of a Transportation Management Plan (TMP), as discussed in Section 1.4.1.6, *Standardized Project Measures*, would minimize short-term construction impacts on neighborhoods and communities along I-680.

None of the Build Alternatives would affect access to or result in the removal of neighborhood facilities or services that are needed and valued by neighborhood residents. Although temporary detours would be need for the Iron Horse Regional Trail and the Contra Costa Canal Trail/Briones to Mount Diablo Regional Trail, access to these recreational facilities would be maintained, as discussed in Section 2.1.3, *Parks and Recreational Facilities*.

Changes to the community's visual character and quality may occur as a result of all Build Alternatives. This includes removal of mature trees and the addition of urbanizing elements (e.g., new bridges, soundwalls, widened pavement sections). Refer to Section 2.1.9, *Visual and Aesthetics*, for further discussion of impacts to the visual quality of communities.

All Build Alternatives would be constructed along an existing corridor; therefore, permanent impacts on community cohesion are not anticipated within the Community Impact Study Area.

Employment and Income/Business Activity/Fiscal Conditions

The Build Alternatives would not adversely affect regional or local employment rates. As described above, a TMP would be developed and access to businesses and residences would be maintained throughout the 2-year construction period. Therefore, Project construction activities are not anticipated to result in substantial adverse direct or indirect impacts on the operation of any business along the corridor nor result in any unplanned development within the Community Impact Study Area.

Construction of any of the Build Alternatives, which could extend over the 2-year period, could potentially have a beneficial temporary economic impact. Construction could include purchases of local materials, goods, and services required for construction and employment of local workers. The increased economic activity would also prompt secondary economic activity as construction-related business and economic income is spent in sectors throughout the regional economy during construction. Although the Build Alternatives would result in increased short-term local employment and business activity, no permanent employment or increase in business activity is anticipated as a result of construction activities. In addition, temporary impacts should have little or no impact on property values in the Community Impact Study Area because the proposed Project would be constructed largely within existing State ROW. Although there are some lane and ramp closures, in accordance with **TRAN-1**, no two consecutive off-ramps or two consecutive on-ramps in the same direction would be closed concurrently, and access would be maintained at all times during construction, as discussed in Section 2.1.8, *Traffic and Transportation/Pedestrian and Bicycle Facilities*.

The Build Alternatives would generally improve access to adjacent and nearby land uses by reducing congestion. In addition, the Build Alternatives may promote interregional/intraregional trade and goods movement by reducing congestion within the Community Impact Study Area. Residents and workers within the Community Impact Study Area would benefit from enhanced commute options, less time spent in traffic congestion, and improved access associated with the Build Alternatives. Therefore, under all Build Alternatives, the proposed Project would contribute to the ability of communities to create a stronger sense of community character and cohesion by improving mobility for all users, residents, and businesses that provide employment and services within the Community Impact Study Area.

2.1.5.4 Summary

*Alternative 2 has been selected as the preferred alternative. As described above, Alternative 2 would not adversely affect population and housing, community character, or employment and fiscal conditions. Measures **CIA-2** through **CIA-3** would be implemented. The Project would ultimately contribute to the communities' ability to create a stronger sense of community character and cohesion by improving mobility for all users, residents, and businesses. Therefore, impacts on community character and cohesion would not be adverse.*

2.1.5.5 Avoidance, Minimization, and/or Mitigation Measures

Refer to Section 2.1.3, *Parks and Recreational Facilities*; Section 2.1.8, *Traffic and Transportation/Pedestrian and Bicycle Facilities*; Section 2.1.9, *Visual/Aesthetics*; Section 2.2.6, *Air Quality*; and Section 2.2.7, *Noise and Vibration*, for measures related to recreational facilities, traffic, visual impacts, air quality emissions, and noise, respectively. In addition, the following measures would be implemented for all Build Alternatives:

CIA-2 Caltrans will follow the process required for acquisition of right-of-way under the federal Uniform Relocation Assistance Program.

CIA-3 During the design phase, CCTA and Caltrans will continue to coordinate with the City of Walnut Creek to avoid permanent and minimize temporary impacts on operations at Walnut Creek's Corporation Yard (511 Lawrence Way).

2.1.6 Environmental Justice

Please note: Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, has been rescinded pursuant to EO 14173, Ending Illegal Discrimination and Restoring Merit-Based Opportunity, and EO 14096, Revitalizing Our Nation's Commitment to Environmental Justice for All, has been rescinded pursuant to EO 14148, Initial Rescissions of Harmful Executive Orders and Actions. However, consideration of environmental justice was included in the analyses for the Draft Environmental Document, prior to the rescission of EOs 12898 and 14096, and therefore, has been retained in the Final Environmental Document for informational purposes only.

2.1.6.1 Regulatory Setting

All projects involving a federal action (funding, permit, or land) must comply with 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. Low income is defined based on the Department of Health and Human Services poverty guidelines. For 2023, this was $30,000 for a family of four.

EO 14096, *Revitalizing Our Nation's Commitment to Environmental Justice for All*, was enacted on April 21, 2023. EO 14096 on environmental justice does not rescind EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, which had been in effect since February 11, 1994, and was implemented through Department of Transportation (DOT) Order 5610.2C. This implementation will continue until further guidance is provided regarding the implementation of the new EO 14096 on environmental justice. 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 B of this document.

2.1.6.2 Affected Environment

This following discussion is based on the proposed Project's *Community Impact Assessment* (HDR Engineering, Inc., 2023), which was completed in November 2023.

This section describes the race/ethnicity and poverty characteristics in the Study Area and Contra Costa County to identify communities that meet or exceed a threshold for minority populations and low-income households, collectively referred to as environmental justice communities of concern. The environmental justice analysis uses data from the U.S. Census Bureau's 2016–2020 American Community Survey (ACS)

5-Year Estimates for all census tract block groups fully or partially within 0.5 mile of the Project Study Limits, which is referred to as the Environmental Justice Study Area.

Census blocks and census block groups are geographical units used by the U.S. Census Bureau (U.S. Census Bureau, 1994). A block group is the smallest level of geography for census demographic data. A block group is a combination of census blocks.

The Council on Environmental Quality (CEQ) has established the following definitions for National Environmental Policy Act (NEPA) analysis (Council on Environmental Quality, 1997):

- Minority individuals are defined as members of the following population groups: American Indian or Alaskan Native, Asian or Pacific Islander, Black, or Hispanic.
- Minority populations should be identified where either: (a) the minority population of the affected area exceeds 50 percent or (b) the affected area's minority population percentage is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.
- Low-income populations in an affected area should be identified with the annual statistical poverty thresholds from the Bureau of the Census' *Current Population Reports, Series P-60 on Income and Poverty*. In identifying low-income populations, agencies may consider a community as either a group of individuals living in geographic proximity to one another, or a set of individuals (such as migrant workers or Native Americans) where either type of group experiences common conditions of environmental exposure or effect.

Although these are the official definitions for NEPA analyses according to the CEQ, these definitions may not always be appropriate for assessing environmental justice issues in California where minority individuals are the majority of residents and living expenses in some areas are unusually high (California Department of Transportation, 2011).

According to Federal Highway Administration (FHWA) Order 6640.23A, issued in June 2012, and U.S. Department of Transportation (USDOT) Order 5610.2C, issued in May 2021, a minority person is one that is:

1. Black: a person having origins in any of the black racial groups of Africa;
2. Hispanic or Latino: a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race;
3. Asian American: a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent;

4. American Indian or Alaskan Native: a person having origins in any of the original people of North America, South America (including Central America), and who maintains cultural identification through tribal affiliation or community recognition;

5. Native Hawaiian or Other Pacific Islander: people having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.

This also includes individuals identifying as "some other race" and "two or more races."

According to USDOT Order 5610.2C, "Minority Population means any readily identifiable groups of minority persons who live in geographic proximity, and if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who would be similarly affected by a proposed DOT program, policy, or activity."

This analysis compares the percentage of minority persons in each block group to the Contra Costa County average to identify which block groups have a greater percentage of minority persons than the county as a whole and would thus be considered minority populations. The percentage of minority persons in Contra Costa County is 57.4 percent, and there are 17 block groups in the Environmental Justice Study Area with minority percentages that are greater than or equal to 57.4 percent.

According to FHWA Order 6640.23A, issued in June 2012, and USDOT Order 5610.2C, issued in May 2021, a low-income person is a "person whose median household income is at or below the Department of Health and Human Services poverty guidelines." According to USDOT Order 5610.2C, "Low-Income Population means any readily identifiable group of low-income persons who live in geographic proximity, and, if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who would be similarly affected by a proposed DOT program, policy, or activity."

The poverty level for a household of four in 2023 is an annual income of $30,000 (Office of the Assistant Secretary for Planning and Evaluation, 2023). According to FHWA, "A State or locality may adopt a more inclusive threshold for low-income than that specified by the [Department of Health and Human Services], as long as it is inclusive of all persons at or below the [Department of Health and Human Services] poverty guidelines" (Federal Highway Adminitration, 2015a). This analysis includes all households with a median income at or below 200 percent of the federal poverty level, consistent with the methodology of the Study Area's metropolitan planning organization, the Metropolitan Transportation Commission (MTC).

This analysis compares the percentage of low-income households in each block group to the Contra Costa County average to identify which block groups have a greater percentage of low-income households than the county as a whole and would thus be considered low-income populations. The percentage of low-income households in Contra Costa County is 19.5 percent. There are 23 block groups in the Environmental

Justice Study Area with low-income percentages that are greater than or equal to 19.5 percent.

Any block group that meets or exceed the thresholds described above is considered an environmental justice community. In total, 31 block groups were identified as either a minority population, low-income population, or both for the purposes of this assessment.

Table 2.1.6-1 and Figure 2.1.6-1 identify the locations of these block groups, showing large concentrations in the cities of Martinez and Concord, with smaller areas in the cities of Pleasant Hill and San Ramon.

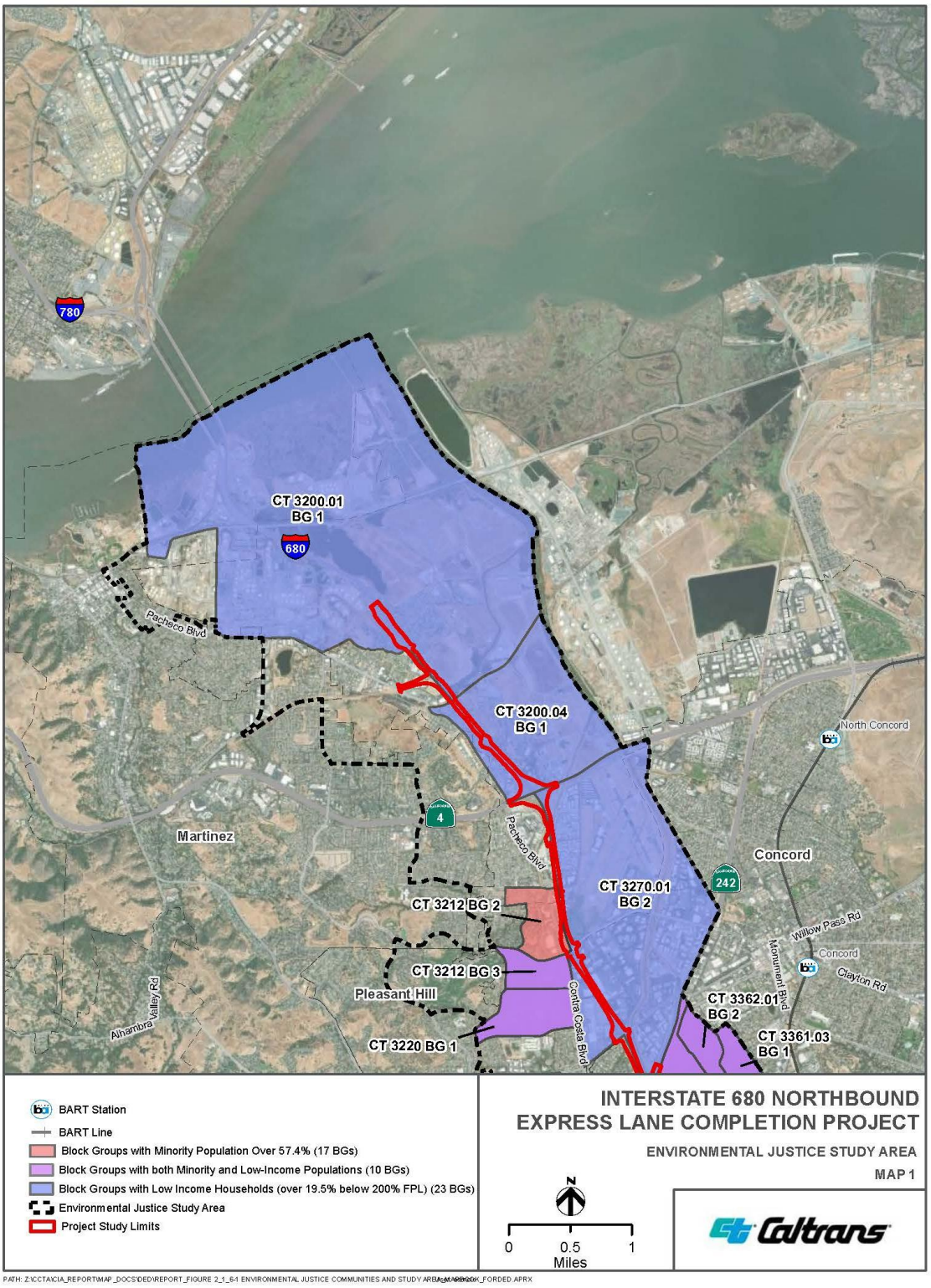


Figure 2.1.6-1. Environmental Justice Communities and Study Area (Map 1 of 3)

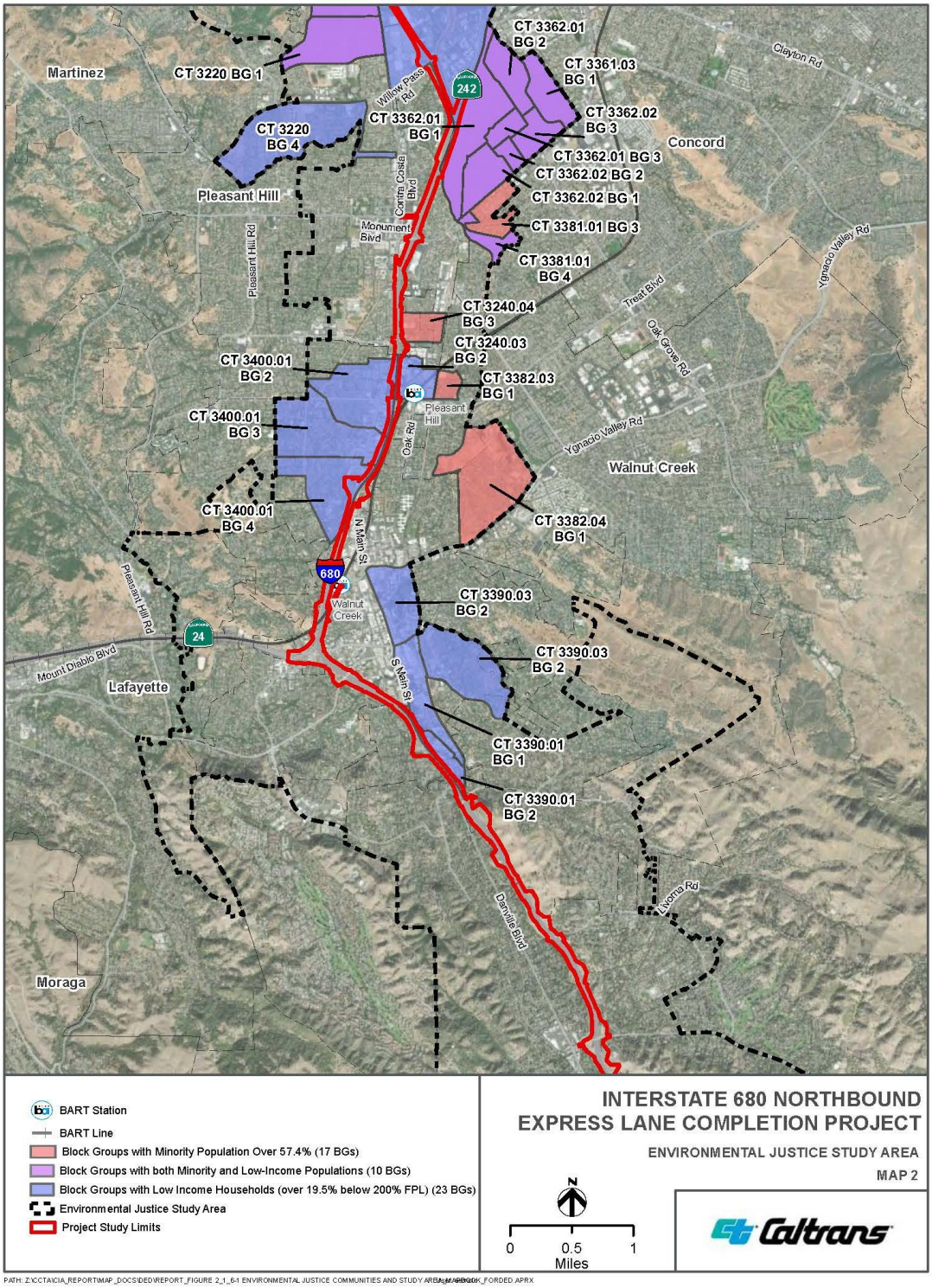


Figure 2.1.6-1. Environmental Justice Communities and Study Area (Map 2 of 3)

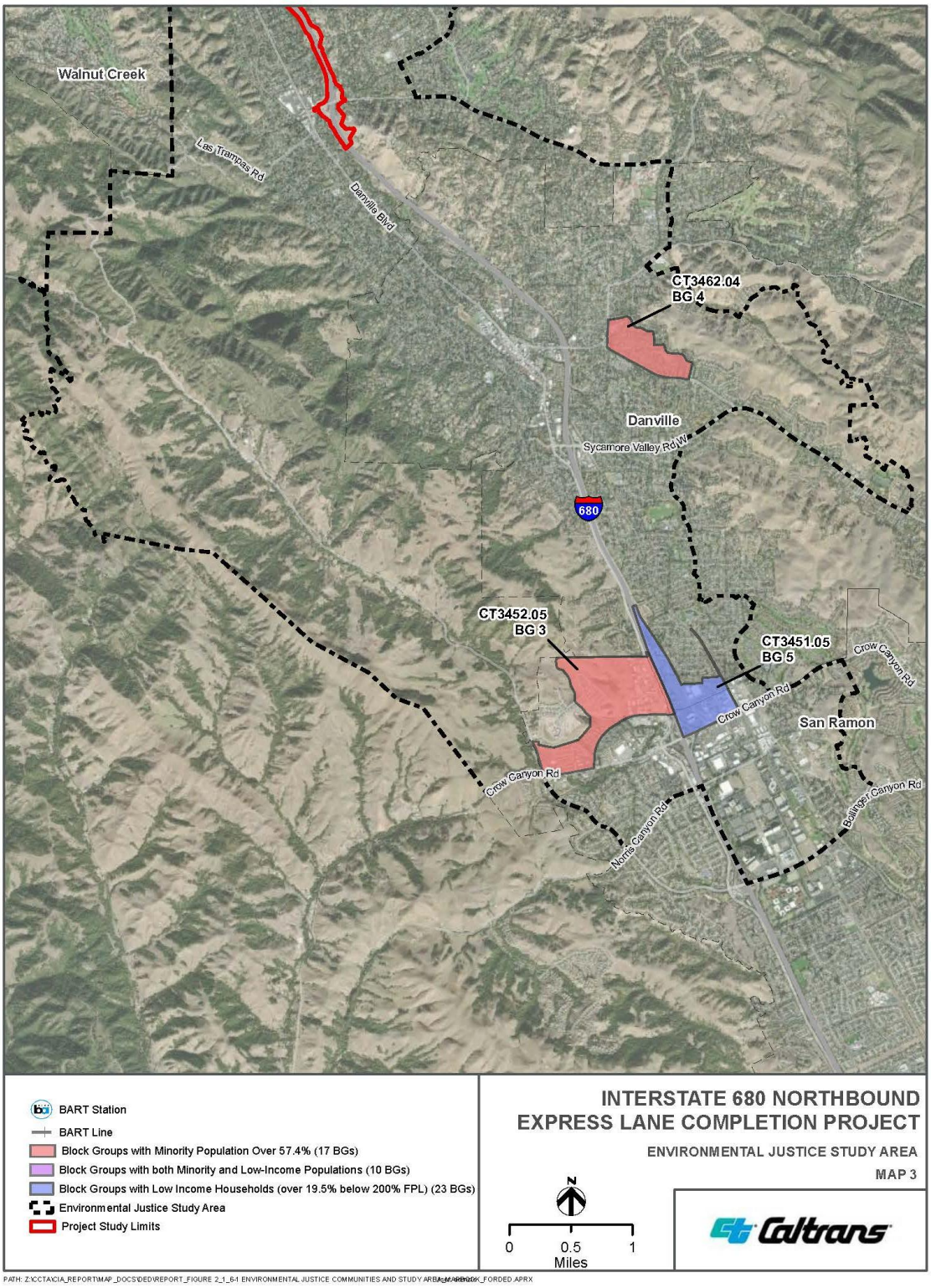


Figure 2.1.6-1. Environmental Justice Communities and Study Area (Map 3 of 3)

Table 2.1.6-1. Environmental Justice Communities in the Study Area

Geography	Percent Minority [1]	Percent Low-Income [2]	Environmental Justice Community
Contra Costa County	**57.4%**	**19.5%**	**N/A**
Environmental Justice Study Area	36%	13%	N/A
Census Tract 3170, Block Group 1	17.9%	19.2%	No
Census Tract 3200.01, Block Group 1	36.1%	**31.2%**	**YES**
Census Tract 3200.01, Block Group 2	47.3%	8.5%	No
Census Tract 3200.04, Block Group 1	40.8%	**27.6%**	**YES**
Census Tract 3200.04, Block Group 4	38.8%	1.7%	No
Census Tract 3211.01, Block Group 1	40.9%	14.8%	No
Census Tract 3211.02, Block Group 1	41.5%	8.3%	No
Census Tract 3212, Block Group 1	42.4%	11.0%	No
Census Tract 3212, Block Group 2	**66.5%**	5.3%	**YES**
Census Tract 3212, Block Group 3	**72.5%**	**46.6%**	**YES**
Census Tract 3212, Block Group 4	51.4%	8.1%	No
Census Tract 3220, Block Group 1	**58.9%**	**19.7%**	**YES**
Census Tract 3220, Block Group 2	35.0%	10.9%	No
Census Tract 3220, Block Group 4	31.1%	**20.1%**	**YES**
Census Tract 3220, Block Group 5	47.5%	3.9%	No
Census Tract 3230, Block Group 1	43.0%	0.2%	No
Census Tract 3230, Block Group 2	37.5%	7.3%	No
Census Tract 3240.02, Block Group 1	43.4%	9.1%	No
Census Tract 3240.02, Block Group 2	34.7%	18.8%	No
Census Tract 3240.02, Block Group 3	**53.4%**	19.2%	**YES**
Census Tract 3240.03, Block Group 1	43.5%	17.2%	No
Census Tract 3240.03, Block Group 2	12.8%	**31.6%**	**YES**
Census Tract 3240.03, Block Group 3	56.6%	11.6%	No

Geography	Percent Minority [1]	Percent Low-Income [2]	Environmental Justice Community
Census Tract 3240.04, Block Group 1	31.1%	17.4%	No
Census Tract 3240.04, Block Group 2	44.4%	17.5%	No
Census Tract 3240.04, Block Group 3	**58.2%**	8.7%	**YES**
Census Tract 3250, Block Group 1	49.9%	13.4%	No
Census Tract 3250, Block Group 5	18.6%	11.6%	No
Census Tract 3270.01, Block Group 2	52.9%	**35.4%**	**YES**
Census Tract 3342, Block Group 1	32.7%	14.0%	No
Census Tract 3342, Block Group 2	26.3%	9.0%	No
Census Tract 3342, Block Group 3	21.4%	11.0%	No
Census Tract 3342, Block Group 4	48.4%	0.0%	No
Census Tract 3342, Block Group 5	22.0%	4.5%	No
Census Tract 3342, Block Group 6	26.9%	0.1%	No
Census Tract 3361.01, Block Group 1	**78.3%**	**54.4%**	**YES**
Census Tract 3362.01, Block Group 1	**67.3%**	**36.4%**	**YES**
Census Tract 3362.01, Block Group 2	**69.3%**	**37.6%**	**YES**
Census Tract 3362.01, Block Group 3	**61.4%**	**39.1%**	**YES**
Census Tract 3362.02, Block Group 1	**79.7%**	**48.5%**	**YES**
Census Tract 3362.02, Block Group 2	**86.6%**	**47.0%**	**YES**
Census Tract 3362.02, Block Group 3	**86.6%**	**63.9%**	**YES**
Census Tract 3381.01, Block Group 3	**85.0%**	17.7%	**YES**
Census Tract 3381.01, Block Group 4	**65.1%**	**43.3%**	**YES**
Census Tract 3381.02, Block Group 1	26.9%	9.9%	No
Census Tract 3382.03, Block Group 1	**69.1%**	16.0%	**YES**
Census Tract 3382.03, Block Group 2	50.8%	9.9%	No
Census Tract 3382.03, Block Group 3	36.3%	11.9%	No
Census Tract 3382.03, Block Group 4	50.5%	1.1%	No

Geography	Percent Minority [1]	Percent Low-Income [2]	Environmental Justice Community
Census Tract 3382.03, Block Group 5	53.1%	6.2%	No
Census Tract 3381.04, Block Group 1	**60.0%**	3.6%	**YES**
Census Tract 3382.04, Block Group 2	49.6%	3.3%	No
Census Tract 3390.01, Block Group 1	41.1%	**42.9%**	**YES**
Census Tract 3390.01, Block Group 2	46.7%	**27.2%**	**YES**
Census Tract 3390.01, Block Group 3	27.1%	19.0%	No
Census Tract 3390.03, Block Group 1	36.5%	14.0%	No
Census Tract 3390.03, Block Group 2	31.5%	**21.3%**	**YES**
Census Tract 3390.04, Block Group 1	34.9%	10.0%	No
Census Tract 3390.04, Block Group 2	38.2%	3.3%	No
Census Tract 3400.01, Block Group 1	42.9%	13.2%	No
Census Tract 3400.01, Block Group 2	49.1%	**21.5%**	**YES**
Census Tract 3400.01, Block Group 3	37.6%	**47.3%**	**YES**
Census Tract 3400.01, Block Group 4	49.8%	**23.1%**	**YES**
Census Tract 3400.04, Block Group 1	4.9%	8.4%	No
Census Tract 3400.04, Block Group 2	10.3%	7.3%	No
Census Tract 3400.04, Block Group 3	47.4%	0.0%	No
Census Tract 3410, Block Group 1	28.9%	1.0%	No
Census Tract 3410, Block Group 2	30.9%	0.9%	No
Census Tract 3410, Block Group 3	34.9%	12.6%	No
Census Tract 3430.01, Block Group 2	19.1%	11.6%	No
Census Tract 3430.01, Block Group 4	21.1%	**29.8%**	**YES**
Census Tract 3430.03, Block Group 1	19.3%	2.5%	No
Census Tract 3430.03, Block Group 2	33.2%	6.4%	No
Census Tract 3451.05, Block Group 1	22.5%	2.1%	No
Census Tract 3451.05, Block Group 2	31.4%	3.6%	No

Geography	Percent Minority [1]	Percent Low-Income [2]	Environmental Justice Community
Census Tract 3451.05, Block Group 3	21.7%	2.5%	No
Census Tract 3451.05, Block Group 4	11.1%	12.3%	No
Census Tract 3451.05, Block Group 5	34.8%	**27.0%**	**YES**
Census Tract 3451.14, Block Group 1	13.1%	2.2%	No
Census Tract 3451.18, Block Group 1	57.0%	7.8%	No
Census Tract 3452.03, Block Group 1	22.5%	19.1%	No
Census Tract 3452.03, Block Group 2	28.3%	18.7%	No
Census Tract 3452.03, Block Group 3	10.6%	15.7%	No
Census Tract 3452.03, Block Group 4	15.8%	5.6%	No
Census Tract 3452.04, Block Group 1	23.7%	0.9%	No
Census Tract 3452.04, Block Group 2	8.3%	3.9%	No
Census Tract 3452.05, Block Group 1	32.7%	4.5%	No
Census Tract 3452.05, Block Group 2	46.3%	7.1%	No
Census Tract 3452.05, Block Group 3	**63.1%**	11.8%	**YES**
Census Tract 3452.06, Block Group 2	39.4%	5.6%	No
Census Tract 3461.01, Block Group 1	41.5%	9.8%	No
Census Tract 3461.02, Block Group 1	17.9%	7.5%	No
Census Tract 3462.03, Block Group 1	12.5%	7.9%	No
Census Tract 3462.03, Block Group 2	14.4%	3.7%	No
Census Tract 3462.04, Block Group 1	29.0%	4.0%	No
Census Tract 3462.04, Block Group 4	**59.6%**	0.0%	**YES**
Census Tract 3462.06, Block Group 1	9.3%	11.7%	No
Census Tract 3462.06, Block Group 2	40.0%	7.2%	No

Source: (HDR Engineering, Inc., 2023)
Notes:

1. Based on U.S. Census Bureau, 2016–2020 American Community Survey, 5-Year Estimates Table B03002: Hispanic or Latino Origin by Race
2. Based on U.S. Census Bureau, 2016–2020 American Community Survey, 5-Year Estimates Table C17002: Ratio of Income of Poverty Level in the Past 12 Months

2.1.6.3 Environmental Consequences

FHWA Order 6640.23A defines a disproportionately high and adverse effect on environmental justice communities as an adverse effect that either:

- is borne predominately by a minority and/or a low-income population;
- will be suffered by the minority and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority and/or non-low-income population.

Before determining whether environmental justice communities would experience disproportionately high and adverse effects as a result of a project, any potential adverse effects of the proposed action are identified. With the consideration of any project avoidance, minimization, and mitigation measures and offsetting benefits to the affected minority or low-income populations, the potential for the proposed action to result in disproportionately high and adverse effects is assessed. This section reviews the Project's potential adverse impacts and whether they would be borne disproportionately by any environmental justice community, as well as any benefits that would be experienced by environmental justice communities.

No-Build Alternative

The No-Build Alternative would maintain the current configurations of Interstate 680 (I-680) in the Environmental Justice Study Area. Under the No-Build Alternative, the proposed Project would not be constructed, and no impacts on environmental justice communities would occur.

All Build Alternatives (Alternatives 1C, 2, 3, and 5)

The Project's proposed improvements do not vary substantially among the Build Alternatives in terms of their environmental impacts on communities, the operational conditions and toll fees, or the transportation benefits they afford. Therefore, unless specifically noted, the following environmental justice evaluation applies to all Build Alternatives. The potential impacts to environmental justice communities are summarized below.

Air Quality

During construction, short-term degradation of air quality is expected from the release of diesel exhaust particulate matter and other emissions from equipment and on-road vehicles powered by gasoline and diesel engines, as well as temporary increases in on-road emissions from construction vehicles. As described in Section 2.2.6, *Air Quality*, Measures **AQ-1** through **AQ-7** would be implemented. With construction best management practices (BMP), the Project would not result in adverse temporary air quality impacts. MTC determined that the Project would not be a project of air quality concern. Moreover, based on the vehicle miles traveled (VMT) forecasts and speed

data, emissions with each Build Alternative would be lower than present levels. Since there are no temporary or permanent adverse air quality impacts, the Project is not expected to result in disproportionately high and adverse air quality effects on environmental justice communities.

Community Character and Cohesion

It is not anticipated that temporary roadway work would result in impacts on community character or cohesion during construction. Although temporary construction easements (TCE) may be required during construction for temporary staging on adjacent roadways, no properties would be temporarily displaced, and access to surrounding properties and city roadways would be maintained. As described in Section 2.1.5, *Community Character and Cohesion*, Measure **CIA-2** would be implemented requiring Caltrans follow the process required for acquisition of right-of-way under the federal Uniform Relocation Assistance Program. Since the Project would not displace any residents, businesses, or community services and facilities, and neighborhood access would not be reduced, the Project would not result in adverse effects on community character and cohesion. Thus, environmental justice communities would not experience disproportionately high and adverse effects related to community character and cohesion.

Hydrology

Potential Project impacts to the existing floodplains are minimal and would not adversely affect communities in the Study Area. As described in Section 2.2.1, *Hydrology and Floodplain*, Measure **HYD-1** would be implemented to ensure during final design that there would be no impacts to the base flood elevation. As a result, no mitigation measures are required. Thus, the Project would not result in disproportionately high and adverse hydrology effects on environmental justice communities.

Water Quality

Temporary construction impacts to water quality have the potential to occur during demolition and roadway construction activities. In addition, the proposed Project would result in a permanent increase in impervious surface area of 12.84 acres under Alternative 1C, 9.06 acres under Alternative 2 (preferred alternative), 16.27 acres under Alternative 3, and 2.93 acres under Alternative 5, which would increase the runoff from I-680. As described in Section 2.2.2, *Water Quality and Stormwater Runoff*, Measures **WQ-1** through **WQ-4** would be implemented. With these measures in place, the Project would not result in disproportionately high and adverse water quality effects on environmental justice communities.

Parks and Recreation

Construction activities would result in temporary, localized, site-specific disruptions to the Contra Costa Canal Trail/Briones to Mount Diablo Regional Trail and Iron Horse Regional Trail. Portions of these trails would be closed temporarily during construction,

and a segment of the Iron Horse Regional Trail under the Rudgear Road Undercrossing Bridge would be permanently relocated with Alternatives 1C, 2 (preferred alternative), and 3. As described in Section 2.1.3, *Parks and Recreational Facilities*, Measures **PR-1** through **PR-3** would be implemented. Caltrans would work with the East Bay Regional Park District to identify temporary detours and the trail's permanent location prior to construction. These disruptions would not adversely affect nearby communities or minority or low-income populations since detours would be made available to maintain access.

Noise and Vibration

Roadway construction activities would occur for relatively short periods in any specific location as construction proceeds along the Project's alignment. With the exception of possible nighttime construction involving heavy equipment, construction noise levels would not be expected to exceed the quantitative noise limits established by Caltrans. Impact pile driving during construction may be required near residential apartment buildings in southern Walnut Creek, which is identified as an environmental justice community. To reduce the potential for noise and vibration impacts resulting from Project construction, Measures **NOI-1** and **VIB-1** would be implemented, which are described in Section 2.2.7, *Noise and Vibration*. This would require that the construction contractor consider implementing measures including the prohibition of impact pile driving within the exceedance disturbance distances and the use of an alternative method to impact pile driving (i.e., cast-in-drilled-hole piles) where geological conditions allow. All construction equipment shall conform to Standard Special Provision (SSP) Section 14-8.02, Noise Control, which requires noise not to exceed 52 dBA, preparation of a Noise Control Plan (NCP) and noise monitoring, and letters to be sent to sensitive receptors as part of the NCP. In addition, noise abatement in the form of soundwalls has been considered in compliance with 23 CFR 772, which is discussed further in Section 2.2.7, *Noise and Vibration*. The Project is not anticipated to result in adverse permanent or temporary noise or vibration impacts. Therefore, the Project would not result in disproportionately high and adverse noise or vibration effects on environmental justice communities.

Visual

During construction, viewers would temporarily see materials, equipment, workers, and construction operations. These temporary views are not considered adverse impacts and would be visible in both environmental justice and non-environmental justice areas. The permanent Project features located in various areas (both environmental justice and non-environmental justice) along the corridor—with the most visible being retaining walls, sound walls, and toll gantries—would result in moderate to moderate-high visual impacts for motorists on I-680 and adjacent sensitive receptors, including single-family residents, recreation facilities, churches, and schools. Sound walls would block motorists' views of the mature trees and screening shrubs to the east of Mount Diablo. Each Build Alternative would remove the existing trees and screening shrubs. Single- and multi-family residential neighborhoods would have views of the Project, including variable toll message signs, which emit and reflect light. As described in Section 2.1.9,

Visual and Aesthetics, Measures **VIS-1** through **VIS-5** would be implemented, which would assist in reducing visual impacts from Project features. These measures, which would be implemented in both environmental justice and non-environmental justice areas, include minimizing vegetation removal, vegetation protection, tree replacement, aesthetic treatments, and construction measures (e.g., limitations to construction lighting, storage of unsightly equipment and materials, revegetation of disturbed areas, and provision of screening).

Because temporary and permanent visual impacts would be minimized and not affect environmental justice communities more than non-environmental justice communities, the Project would not result in disproportionately high and adverse visual effects on environmental justice communities.

Utilities

Utilities would be protected in place or relocated to avoid any service disruptions. As described in Section 2.1.7, *Utilities and Emergency Services*, Measures **UES-1** and **UES-2** would be implemented to ensure utility services are maintained during construction. Therefore, environmental justice communities would not experience disproportionately high and adverse effects related utilities and public services.

Access and Circulation

Trips generated by construction activities would add additional traffic on the local roadway network and may temporarily generate additional delays at the Study Area roadways and intersections. Existing transit service may experience minor delays due to potential construction-related traffic and activities. In the event of temporary lane and/or street closures, alternate routes and signage would be provided, and access to and from residences and businesses would be maintained throughout the duration of construction.

Two ramps would potentially experience long-term closures during construction: southbound Olympic Boulevard off-ramp (closed for up to 11 months in Alternatives 1C and 3) and northbound North Main Street off-ramp (closed for up to 1 month in Alternatives 2, 3, and 5). Southbound Olympic Boulevard off-ramp is not located in an environmental justice community. Northbound North Main Street off-ramp is located in an environmental justice community. As described in Section 2.1.8, *Traffic and Transportation / Pedestrian and Bicycle Facilities*, Measure **TRAN-1** would be implemented requiring that no two consecutive off-ramps or two consecutive on-ramps in the same direction would be closed concurrently. In addition, a Transportation Management Plan (TMP) would be developed to ensure that all communities have freeway access and would not be adversely impacted by the temporary closures.

With all Build Alternatives, the Project is expected to improve travel times in both general purpose and managed lanes in the afternoon peak hours. The Project would also increase vehicle and person throughput with implementation of Alternatives 1C, 2, and 3. Since Alternative 5 reduces capacity, throughput (vehicle and person) is

forecasted to be less than the No-Build. While no alternative fully eliminates bottlenecks and associated queuing within the transportation Study Area, Alternatives 1C, 2 (preferred alternative), 3, and 5 would reduce bottlenecks in the afternoon peak hours. However, Alternatives 1C and 3 would extend queuing onto eastbound State Route (SR) 24. Alternative 2 (preferred alternative) would not extend queuing onto eastbound SR-24. Travel times for Alternatives 1C, 2, and 3 would be similar to the No-Build in future years in the morning peak hours. Alternative 5 would increase travel time in the morning peak hours compared to the No-Build. Alternatives 1C, 2, 3, and 5 all provide substantial travel time benefits along northbound I-680 compared to the future No-Build Alternative for the afternoon peak hours. All users would benefit from these improvements, whether solo drivers who pay a fee or those who drive free of charge as carpools in the express lane or general-purpose lane.

With the incorporation of measures defined in the TMP and the consideration of the offsetting transportation benefits from the improvements, the Project would not result in disproportionately high and adverse access and circulation effects on environmental justice communities.

Economic Effects of Tolling

Project operation would provide an opportunity for single-occupancy vehicles (SOV) to access a northbound express lane for a fee. In the northbound direction, high-occupancy vehicles (HOV) would continue to be able to use the express lane for free, and SOVs would have free access to the general-purpose lanes. When the express lane is in operation and charging a toll for access, (i.e., when there is congestion on the roadway and additional available capacity in the managed lane) a SOV would be given a choice to use the express lane or not; much of that decision would be based on the posted fee, which would vary depending on congestion levels. There is no direct economic impact to those who opt to not use the express lane. The decision to use the express lane is dependent upon users' ability to set up a FasTrak® account (also known as a transponder), their willingness to pay the toll, and their perceived benefit from using the lane.

Ability to Obtain a Toll Tag

With the Project implemented, the policies related to how to obtain a toll tag and set up a user account would be the same for northbound I-680 users as they are currently for southbound I-680 users and bi-directional users south of the Study Area. It is anticipated that those who use the proposed northbound express lane would also be traveling along southbound I-680 and are already informed of the express lane in the southbound direction and the policies regarding the acquisition and maintenance of a toll tag account.

The tolling rules for the existing I-680 express lane operation, which would apply to the Project's new express lane, include:

- The toll fee adjusts dynamically depending on real-time traffic levels;
- Drivers always pay the toll displayed when they enter the Express Lane, even if toll rates change during their trip;
- All vehicles must have a FasTrak® account to use the lane as a paying customer;
- Carpools with two or more people, vanpools, buses, and motorcycles travel toll-free with a switchable toll tag (FasTrak® Flex tag) set to the 2 or 3+ position;
- Solo drivers in eligible clean-air vehicles (CAV) can use the lane for free with a FasTrak® CAV toll tag. Eligible CAVs are those with red, purple, orange, or blue decals;
- Other solo drivers pay the full toll to use the express lanes with either a standard FasTrak® toll tag or a FasTrak® Flex tag set to the 1 position.

Express lane users need to have a FasTrak® account to use the lane as a paying customer and carpoolers would need to have a FasTrak® Flex tag to access the express lane without incurring a fee. Based on the current policies for most systems, including the MTC Program, Bay Area FasTrak requires an up-front cost to acquire a toll tag and most systems also require a pre-paid balance from which tolls are deducted. These requirements can make it difficult for low-income persons who do not have a bank account, debit card, or credit card to purchase a toll tag and maintain an account balance.

Bay Area FasTrak offers multiple ways for someone to acquire a toll tag, including ordering one online, calling a toll-free number, printing out a form and mailing it to FasTrak®, going to the FasTrak® customer service center in San Francisco in person, or purchasing a FasTrak® tag at Costco or Walgreens stores. Once the tag is acquired, an account must be set up and toll charges are paid through various methods. Typically, the toll tag account is linked to a bank account, debit card, or credit card.

Offering a cash payment option is necessary for drivers who are unbanked, underbanked, do not want an account, or simply prefer to pay in cash. The 2021 Federal Deposit Insurance Corporation's *National Survey of Unbanked and Underbanked Households* found that an estimated 4.5 percent of United States households were "unbanked" in 2021, meaning that no one in the household had a checking or savings account at a bank or credit union (Federal Deposit Insurance Corporation, 2021). In California, the percentage of unbanked households ranges from 5.6 to 7.6 percent. Funds may also be added to a FastTrack® account by cash at more than 100 Cash Payment Network locations, including many Walmart stores.

Ability and Willingness to Pay the Toll

While the toll is the same for any driver at a given time across a certain distance, for low-income drivers, the toll would comprise a higher percentage of their household income and would be more of a burden on their household budget. While the toll is a larger percentage of income for lower-income users, the value of time may also play a factor in the decision to use a tolled lane. The choice by drivers to use the express lane as a solo driver and incur a fee would be based on several factors, including the potential to be late for work or potential to be late for a child's pick-up. These factors balance the price of the toll against other costs that may be incurred with a loss of time, thus factoring in the user's value of time.

According to a 2019 study, *I-405 Express Toll Lanes Analysis: Usage, Benefits, and Equity*, conducted by the Washington State Transportation Center and reported in a June 2021 article, *Are Express Lanes Equitable?*, lower-income drivers benefit more than higher-income drivers per trip in variably priced toll lanes (University of Washington, 2019; Reason Organization, 2021). The study revealed that higher income groups used the facility more often, thereby obtaining a larger share of the benefits per user than lower income groups. However, lower income users were found to obtain higher net benefits per trip than higher income groups because they used the facility more strategically. The University of Washington (2019) found that higher income users gain 21 percent less in net benefit per trip than lower income users (see Figure 2.1.6-2)

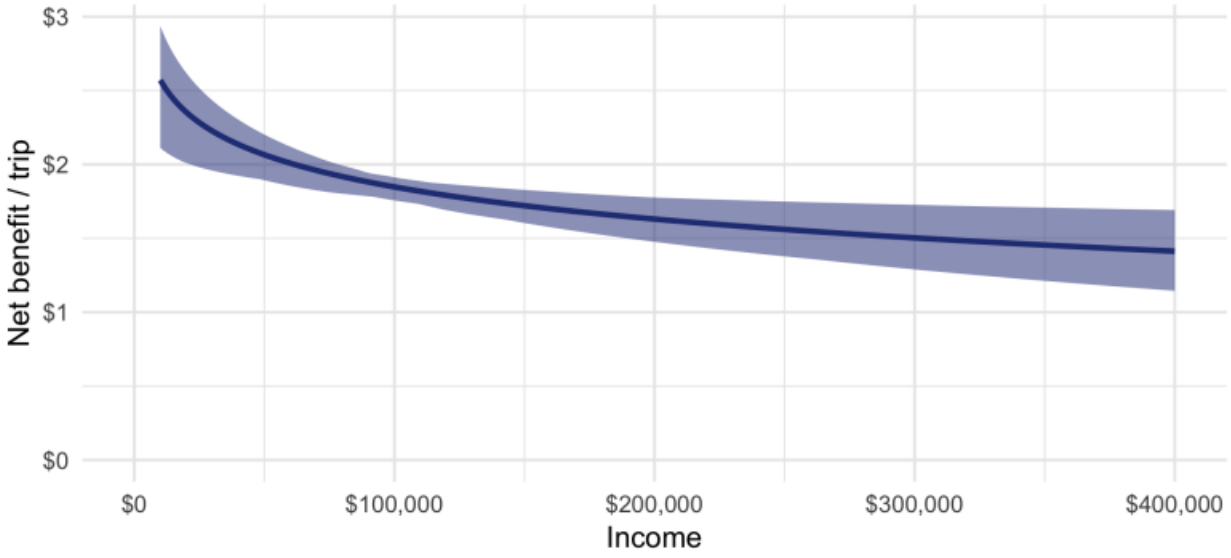


Figure 2.1.6-2. Net Benefit Per Trip by Income (University of Washington, 2019)

The University of Washington (2019) also found that low-income users make up a larger percentage of users during peak periods and in peak directions (see Figure 2.1.6-3). Figure 2.1.6-4 shows that per-trip net benefit is highest precisely during peak periods. By travelling during peak periods when per-trip net benefits are highest, lower-income drivers across the region gain relative to higher-income drivers.

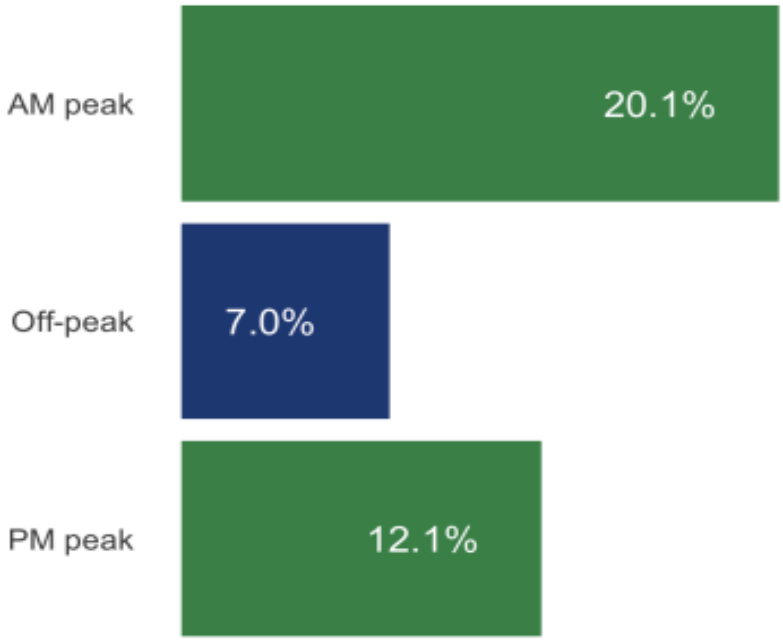


Figure 2.1.6-3. Share of Users with Household Income below $35,000 Per Year (University of Washington, 2019)



Figure 2.1.6-4. Net Benefit per Trip by Time of Day and Direction (University of Washington, 2019)

According to research reported by FHWA in their Urban Partnership Agreement, *Low-Income Equity Concerns of U.S. Road Pricing Initiatives*, a wide range of income groups use value priced lanes at different frequency levels (Federal Highway Administration, 2015b). One example cited was the SR-91 express lanes in California that has approximately one-quarter of drivers using the toll facility at any given time being high-income, while the remainder of toll-lane users are low- and middle-income drivers.

INNOVATE 680 User Surveys

A Contra Costa Transportation Authority (CCTA) INNOVATE 680 User Survey conducted between November 18, 2020, and January 4, 2021, asked potential I-680 users if they would rather save time or money. While a large number of respondents had no preference, 39 percent of people of color and 27.5 percent of low-income respondents indicated a preference for saving time, compared to 16.3 percent of people of color and 12.4 percent of low-income respondents preferring to save money.

CCTA's INNOVATE 680 User Survey (Wave 2), conducted between November 1 and December 17, 2022, asked potential I-680 express lane users a series of questions related to their willingness to use express lanes on I-680. The results of the survey questions related to the use of the existing I-680 express lanes are summarized in Table 2.1.6-2 and indicate that minority (people of color) drivers and non-minority drivers share the same tendency to use the existing I-680 express lanes. However, the survey results also show that low-income drivers are more than twice as unlikely to use the existing I-680 express lanes as higher-income drivers. Just over 20 percent of low-income users cited the cost as a deterrent to using the existing express lanes, while 18.5 percent of low-income users noted that the express lanes do not provide a benefit to them.

Table 2.1.6-2. INNOVATE 680 User Survey Results Regarding the Use of Existing I-680 Express Lanes

Questions and Responses	People of Color	White	Low-Income[1]	Non-Low-Income[1]
Do you use the express lanes along I-680?				
No	41.5%	41.9%	58.8%	27.8%
Occasionally I pay a fee to use them when congestion is very bad	16.0%	18.8%	16.0%	20.5%
Sometimes, but only when I am carpooling	30.9%	35.4%	19.3%	43.8%
Yes, almost every day as a paying single occupant vehicle	5.3%	2.6%	3.4%	4.5%
Yes, almost every day as a carpool	6.4%	1.3%	2.5%	3.4%
Why don't you use them? Select all that apply.				
I am not carpooling	14.9%	13.2%	21.2%	9.7%

Questions and Responses	People of Color	White	Low-Income[1]	Non-Low-Income[1]
They are too expensive	17.0%	14.5%	20.3%	11.4%
They do not provide a benefit for me	11.7%	14.9%	18.5%	8.6%
I do not have a FasTrak toll transponder	8.5%	5.7%	8.4%	5.1%
I do not understand how they operate	3.2%	3.5%	4.2%	3.4%
Other	7.4%	7.9%	11.9%	4.5%
None of the above	3.2%	1.7%	2.5%	1.1%
Would you use express lane along northbound I-680 as a paying single occupant vehicle to avoid severe traffic congestion?				
Yes, regularly	35.1%	45.9%	40.3%	42.0%
Yes, if needed	11.7%	4.8%	7.6%	6.3%
No	48.9%	41.9%	40.3%	50.0%
Not applicable	4.3%	7.4%	11.8%	1.7%
How much would you be willing to pay to use an express lane as a single occupant vehicle to avoid severe traffic congestion?				
Not willing to pay	31.9%	43.7%	37.0%	38.1%
Up to $2.00	44.7%	31.9%	45.4%	30.7%
Up to $5.00	18.1%	19.7%	14.3%	24.4%
Up to $10.00	3.2%	2.6%	1.7%	4.0%

Source: (HDR Engineering, Inc., 2023)

Notes:
[1] For the purpose of this survey, “low-income” was defined as a household income of less than $100,000 and “non-low-income” is defined was a household income of greater than $100,000.

CCTA’s INNOVATE 680 User Survey (Wave 2) also asked questions about projected use of the proposed northbound express lanes, including how much a driver would be willing to pay to use the express lane as a solo driver (Table 2.1.6-2). While there were similar results between people of color and white drivers regarding use of the existing I-680 express lanes, a larger percentage of white drivers (45.9 percent) stated they would use the lane regularly as a paying solo driver than people of color (35.1 percent). However, people of color would use the lane more often as needed (11.7 percent, compared to 4.8 percent for white drivers). Low-income drivers and higher-income drivers indicated similar projections for express lane use as a paying solo driver, with 47.9 precent of low-income drivers responding that they would use the lane either regularly or as needed, compared to 48.3 percent of higher-income drivers. Interestingly, half of the higher-income respondents indicated they would not use the

proposed express lane while only 40.3 percent of low-income respondents indicated they would not use it.

When asked how much these potential users of the proposed northbound express lane would be willing to pay as a solo driver, a larger percentage of white drivers indicated they would not be willing to pay anything (43.7 percent) compared to people of color (31.9 percent). Similar percentages of low-income (37.0 percent) and higher-income (38.1 percent) drivers would not be willing to pay anything. Over 45 percent of low-income drivers would be willing to pay up to $2 to use the lane, and an additional 14.3 percent would pay up to $5. However, higher income drivers would be more willing to pay higher tolls than low-income drivers, with 4.0 percent willing to pay $10 compared to only 1.7 percent of low-income drivers willing to pay $10.

Offsetting Benefits to Environmental Justice Communities

Transportation Benefits

The purpose of the Project is to reduce peak-period congestion and delay on northbound I-680, reduce travel time and improve travel time reliability in the corridor, encourage use of HOV and transit service, optimize use of the existing HOV lane capacity in the corridor to better meet current and future traffic demands, and offer non-carpool eligible drivers a reliable travel time option.

Express lanes in the Bay Area reduce congestion by using additional and/or underutilized freeway capacity by allowing solo drivers to access express lanes for a fee. Qualifying HOVs and CAVs would be able to use the express lane for free. The SOV toll would be determined to ensure that free-flow traffic (i.e., traffic moving at least 45 miles per hour) is always maintained. With the technology necessary for the express lane implementation, express lanes provide improved enforcement for HOV “cheaters,” thereby providing greater benefit and improved access to law-abiding carpools, vanpools, CAV, transit vehicles, and paying SOVs permitted in the lane. The Project would improve transportation operations along I-680 by maximizing the system’s capacity.

Project operation provides drivers along I-680 the option to remain in general-purpose lanes free of charge, use the northbound express lane as a qualifying HOV free of charge, or use the northbound express lane as a SOV for a fee. For drivers opting to pay the fee to use the express lane, users would experience a more reliable trip with less congestion and decreases in travel time in the afternoon peak hours. For drivers opting to remain in the general-purpose lanes, there would be no degradation of trip reliability or travel time with the Project in the afternoon peak hours compared to the No-Build condition. Instead, with the Project, there is a forecasted improvement in travel times for all users as a result of reduced congestion within the general-purpose lanes during the afternoon peak hours (DKS Associates, 2023).

Project implementation would also improve travel time for buses that use I-680 during the afternoon peak hours. Transit users would enjoy the benefit of their buses traveling

in the express lane with less congestion, resulting in more reliable travel time. According to the American Public Transportation Association, bus riders are predominantly people of color and/or lower income (American Public Transportation Association, 2017). In 2017, 65 percent of all bus riders in the United States were non-white and 69 percent of all bus riders had annual household incomes of less than $50,000. The trend is similar in the San Francisco Bay Area. The *Link21 Equity Baseline Report*, which looked at transit use demographics, reports that 40 percent of all transit trips (including rail) taken by white riders are made via bus, while the proportion of transit trips made by bus is 60 percent for Hispanic riders, 66 percent for Black/African American riders, and 57 percent for Asian riders (Link21, 2022). As with the American Public Transportation Association's national findings, according to the *Link21 Equity Baseline Report*, the vast majority of transit users in the Bay Area with annual household incomes below $50,000 ride buses. Given these data, the benefit that the Project affords to transit riders in the I-680 corridor would be experienced more so by people of color and lower-income bus riders.

Economic Benefits

The benefit of faster travel in the northbound I-680 express lane would be available to all users (both environmental justice and non-environmental justice); however, this option for environmental justice communities may have greater benefit at times when their travel is very time-sensitive, and the toll fee may be less than their value of time. The ability to reach a destination faster and spend less time in traffic could result in economic benefits that would be proportionately greater for lower-income users. These benefits may include avoidance of financial penalties for being late or reduction in expenditures for gasoline. A 2019 study on the I-405 corridor in the Puget Sound (Seattle) region (University of Washington, 2019) found that although higher-income households take more trips and accrue significantly more net benefits in aggregate than lower-income users, lower-income drivers benefit more than higher-income driver per trip because low-income users make up a larger fraction of users during peak periods and in peak directions. For some users, the Project may provide the improved mobility that would enable them to access educational opportunities or higher-paying jobs.

Environmental Justice Finding

Based on the evaluation of the Project's potential adverse impacts and offsetting benefits on environmental justice communities, Project implementation would not result in disproportionately high and adverse effects on minority or low-income populations. However, some low-income drivers may not receive the benefits of the proposed new northbound express lane if they are not a qualifying HOV or CAV, are not riding transit, or opt to remain in the general-purpose lanes due to financial constraints.

The fee structure would be similar to that implemented currently in the southbound express lanes. By closing or reducing the existing gap in managed lanes, the Project would incrementally improve traffic in the general-purpose lanes during the afternoon peak period, directly benefiting drivers in the general-purpose lanes. In addition, all Build Alternatives, except Alternative 5, would improve traffic in the morning peak period

compared to the No-Build scenario. Tolls collected from the express lane would be used to cover direct expenses related to operation, maintenance, construction, and administration of the lanes in accordance with California Streets and Highways Code Section 149.7. The remaining toll revenue could be used for other transportation and transit improvements in the Project corridor subject to availability and eligibility. Therefore, the Project would provide direct benefits to both drivers and transit customers. In addition, as discussed in Section 3.2.17, *Transportation*, of the California Environmental Quality Act (CEQA) evaluation, Alternatives 1C, 2 (preferred alternative), and 3 would include the implementation of CEQA mitigation for VMT, which would facilitate and incentivize transit use in Contra Costa County.

2.1.6.4 Summary

Alternative 2 has been selected as the preferred alternative. EO 12898 has been rescinded pursuant to EO 14173, and EO 14096 has been rescinded pursuant to EO 14148. The environmental justice discussion has been retained in the Final Environmental Document for informational purposes only.

2.1.6.5 Avoidance, Minimization, and/or Mitigation Measures

Based on the above discussion and analysis, the Project will not cause disproportionately high and adverse effects on any minority or low-income populations in accordance with the provisions of EO 12898. EO 12898 has been rescinded pursuant to EO 14173. The environmental justice discussion has been retained in the Final Environmental Document for informational purposes only. No further environmental justice analysis is required.

2.1.7 Utilities/Emergency Services

2.1.7.1 Affected Environment

This following discussion is based on the proposed Project's *Community Impact Assessment* (HDR Engineering, Inc. 2023), which was completed in November 2023, and the *Project Approval/Environmental Document (PA/ED) Utility Report* (HDR Engineering, Inc./WRECO, 2023). The Community Impact Study Area is described in Section 2.1.1, *Existing and Future Land Use*.

Utilities

Table 2.1.7-1 identifies the existing utilities and utility owners located within the Project Study Limits. The East Bay Municipality Utility District (EBMUD), Central Contra Costa Sanitary District (CCCSD), Contra Costa Water District (CCWD), Pacific Gas & Electric (PG&E), AT&T, Comcast, Verizon, Sprint, Wave-Astound Broadband, and Kinder/Morgan provide utility services within the Community Impact Study Area.

Table 2.1.7-1. Existing Utilities in the Project Study Limits

Utility Description	Utility Owner
Overhead and underground electric and gas lines	PG&E
Telephone lines	Verizon, Sprint
Telecommunication services lines	Comcast
Fiber optic cables	Wave-Astound Broadband, AT&T
Water lines	EBMUD, CCWD
Sewer lines	CCCSD
10-inch, high-pressure pipeline	Kinder Morgan Energy Partners, L.P.

Source: (HDR Engineering, Inc./WRECO, 2023)

Notes: PG&E = Pacific Gas & Electric; EBMUD = East Bay Municipality Utility District; CCWD = Contra Costa Water District; CCCSD = Central Contra Costa Sanitary District

Overhead electric/utility lines owned by PG&E are located along the Treat Boulevard I-680 off-ramp and across I-680 near Castle Hill Road. PG&E-owned electric pull boxes and utility boxes are located within the Project Study Limits. Several high priority utilities, including PG&E natural gas pipelines and a Kinder Morgan petroleum pipeline, were identified within the Project Study Limits. High priority utilities are potentially hazardous to workers or the public if damaged (HDR Engineering, Inc./WRECO, 2023). In addition, EBMUD's Fleet Maintenance East Facility, located at 2658 North Main Street, is near the Project Study Limits, and the Mokelumne Aqueduct, which EBMUD owns in fee, is adjacent to and intersects the Project Study Limits.

Table 2.1.7-2 provides the utility services that serve the cities and unincorporated areas of Contra Costa County within the Community Impact Study Area by jurisdiction.

Table 2.1.7-2. Utilities Services by Jurisdiction

Jurisdiction	Water Service Provider	Wastewater Service Provider	Solid Waste Service Provider	Gas & Electricity Provider	Telecommunications Provider
City of San Ramon	EBMUD	CCCSD	VWM Republic Services of Northern California	PG&E	Verizon, Sprint, Comcast, Wave, and AT&T
Town of Danville	EBMUD	CCCSD	CCCSWA	PG&E	Verizon, Sprint, Comcast, Wave, and AT&T
Unincorporated Contra Costa County (Community of Alamo)	EBMUD	CCCSD	CCCSWA	PG&E	Verizon, Sprint, Comcast, Wave, and AT&T
City of Walnut Creek	EBMUD	CCCSD	CCCSWA	PG&E	Verizon, Sprint, Comcast, Wave, and AT&T
City of Pleasant Hill	CCWD	CCCSD	Republic Services	PG&E	Verizon, Sprint, Comcast, Wave, and AT&T
City of Concord	CCWD	CCCSD	CDS	PG&E	Verizon, Sprint, Comcast, Wave, and AT&T
City of Martinez	MWD and CCWD	CCCSD and MVSD	Martinez and Republic Services	PG&E	Verizon, Sprint, Comcast, Wave, and AT&T

Sources: (City of San Ramon, 2019), (Town of Danville, 2013), (Town of Danville, 2023a), (East Bay Municipal Utility District, 2023), (Central Contra Costa Sanitary District, 2023), (City of Walnut Creek, 2019), (City of Pleasant Hill, 2023), (City of Concord, 2007), (City of Martinez, 2022), (HDR Engineering, Inc./WRECO, 2023)

Notes: EBMUD = East Bay Municipality Utility District; CCCSD = Central Contra Costa Sanitary District; VWM = Valley Waste Management; PG&E = Pacific Gas & Electric; CCCSWA = Central Contra Costa Solid Waste Authority; CCWD = Contra Costa Water District; CDS = Concord Disposal Service; MWD = Martinez Water Department; MVSD = Mt. View Sanitary District

Emergency Services

Fire Protection

Based on information from the California Fire Hazard Severity Zone (FHSZ) viewer (California Department of Forestry and Fire Protection, 2022), the proposed Project Study Limits are not within a local responsibility area (LRA). Small portions of the Community Impact Study Area, south of the State Route (SR) 24 Interchange, are within an LRA and classified as a high FHSZ, as shown in Figure 2.1.7-1. This figure also provides the locations of fire protection emergency services within the Community Impact Study Area. Table 2.1.7-3 identifies the fire protection emergency services that serve the cities and unincorporated areas of Contra Costa County within the Project Study Limits.

Table 2.1.7-3. Fire Protection Emergency Services by Jurisdiction

Jurisdiction	Fire Protection Emergency Service Provider
City of San Ramon	San Ramon Valley Fire Protection District
Town of Danville	San Ramon Valley Fire Protection District
Community of Alamo	San Ramon Valley Fire Protection District
City of Walnut Creek	Contra Costa County Fire Protection District
City of Pleasant Hill	Contra Costa County Fire Protection District
City of Concord	Contra Costa County Fire Protection District
City of Martinez	Contra Costa County Fire Protection District

Sources: (City of San Ramon, 2019), (San Ramon Valley Fire Protection District, 2023), (Town of Danville, 2013), (City of Walnut Creek, 2019), (City of Pleasant Hill, 2003), (City of Concord, 2007), (City of Martinez, 2022), (Contra Costa County Fire Protection District, 2023)

The San Ramon Valley Fire Protection District provides fire, rescue, and emergency medical services to the cities of San Ramon and Danville and unincorporated Contra Costa County (Community of Alamo). Station 31, which is located at 800 San Ramon Valley Boulevard in the town of Danville, is within the Community Impact Study Area. The Contra Costa County Fire Protection District provides fire protection and first responder emergency medical services to the cities of Walnut Creek, Pleasant Hill, Concord, and Martinez. Station 5 in the city of Pleasant Hill and Station 9 in the city of Martinez are located within the Community Impact Study Area.

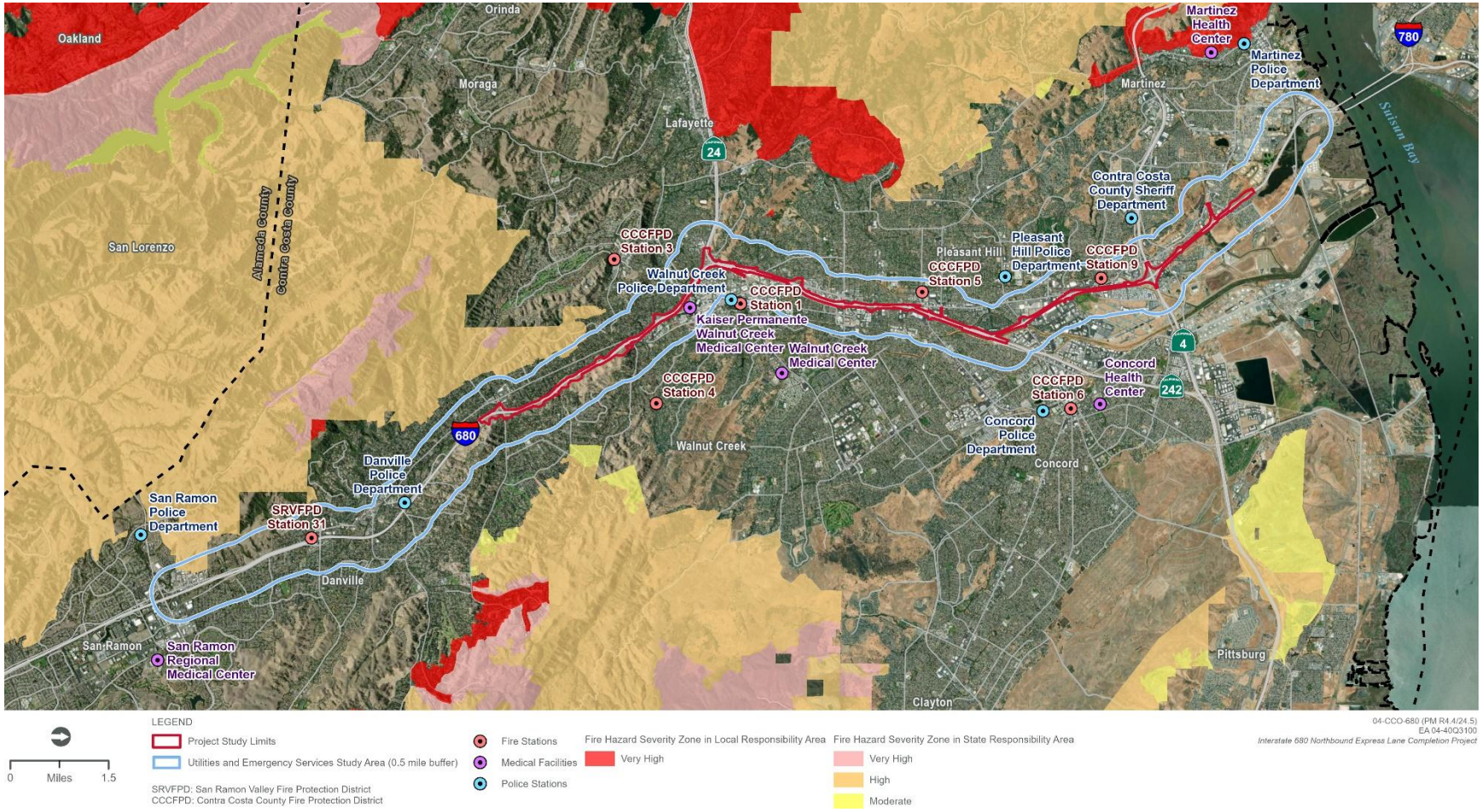


Figure 2.1.7-1. Fire Hazard Severity Zones and Emergency Services

Law Enforcement

The California Highway Patrol (CHP) has primary patrol jurisdiction over all California highways, roads, and streets outside city limits. As such, CHP has jurisdiction over the I-680 corridor for matters involving traffic violations and emergency services. There is a CHP station located at 5001 Blum Road, Martinez, CA, within the Community Impact Study Area.

Table 2.1.7-4 identifies the additional law enforcement emergency services that serve the cities and unincorporated areas within the Community Impact Study Area.

Table 2.1.7-4. Law Enforcement Emergency Services by Jurisdiction

Jurisdiction	Law Enforcement Emergency Service Provider
I-680 Corridor	California Highway Patrol
City of San Ramon	San Ramon Police Department and Contra Costa County Sheriff's Department
Town of Danville	Danville Police Department
Unincorporated Contra Costa County (Community of Alamo)	Contra Costa County Sheriff
City of Walnut Creek	Walnut Creek Police Department
City of Pleasant Hill	Pleasant Hill Police Department
City of Concord	Concord Police Department
City of Martinez	Martinez Police Department

Sources: (City of San Ramon, 2023), (Town of Danville, 2023b), (Walnut Creek Police Department, 2023), (Contra Costa County Office of the Sheriff, 2023), (City of Pleasant Hill, 2003), (City of Concord, 2023), (City of Martinez, 2023)

City of San Ramon: The San Ramon Police Department provides law enforcement services to the City of San Ramon and has 63 sworn police officers, 20 civilian staff members, and 40 volunteers (City of San Ramon, 2023). As shown in Figure 2.1.7-1, a police station at 2401 Crow Canyon Road is located approximately 1 mile southwest of the southernmost portion of the Project Study Limits, outside the Community Impact Study Area. The Contra Costa County Office of the Sheriff also provides police dispatch services for the City of San Ramon (City of San Ramon, 2019). As shown in Figure 2.1.7-1, the closest Sheriff Department Station is at 1980 Muir Road, which is approximately 0.9-mile west of the Project Study Limits and outside of the Community Impact Study Area.

Town of Danville: The Danville Police Department (DPD) provides law enforcement services in the town of Danville. DPD has 30 officers, 12 civilian support personnel, eight reserve officers, and 32 volunteers in policing (Town of Danville, 2023b). As

shown in Figure 2.1.7-1, the DPD Station at 500 La Gonda Way is within the Community Impact Study Area.

Unincorporated Contra Costa County (Community of Alamo): Contra Costa County Office of the Sheriff provides law enforcement services for all unincorporated areas in the County, including the Community of Alamo. Contra Costa County Office of the Sheriff has over 1,100 sworn and professional employees and offers a full range of law enforcement services (Contra Costa County Office of the Sheriff, 2023).

City of Walnut Creek: The Walnut Creek Police Department provides law enforcement services in the city of Walnut Creek. The Walnut Creek Police Department consists of an investigation bureau, operations division, patrol sectors, police reserve officers, and a K9 Unit (Walnut Creek Police Department, 2023). As shown in Figure 2.1.7-1, the Walnut Creek Police Department Station at 1666 North Main Street is within the Community Impact Area.

City of Pleasant Hill: The Pleasant Hill Police Department provides law enforcement services in the city of Pleasant Hill. As shown in Figure 2.1.7-1, the Pleasant Hill Police Department, which is located at 330 Civic Drive, is approximately 0.8 mile west of the Project Study Limits and outside the Community Impact Study Area.

City of Concord: The Concord Police Department provides law enforcement services in the city of Concord. As shown in Figure 2.1.7-1, the Concord Police Department Station at 1350 Galindo Street is approximately 1.5 miles east of the Project Study Limits and located outside the Community Impact Study Area.

City of Martinez: The Martinez Police Department provides law enforcement services in the city of Martinez. As shown in Figure 2.1.7-1, the Martinez Police Department Station at 525 Henrietta Street is approximately 2 miles west of the Project Study Limits and outside the Community Impact Study Area.

Medical Facilities

There are no major medical facilities located within the proposed Project Study Limits. As shown in Figure 2.1.7-1, one medical facility, the Kaiser Permanente Walnut Creek Medical Center (1425 South Main Street), is within the Community Impact Study Area. It is approximately 400 feet from the Project Study Limits in the City of Walnut Creek. The next four closest major medical facilities are located approximately 1–2 miles from the Project Study Limits. These medical facilities are shown in Figure 2.1.7-1 and are listed as follows:

- San Ramon Regional Medical Center (6001 Norris Canyon Road in the City of San Ramon): approximately 1 mile southeast of the proposed Project Study Limits
- Walnut Creek Medical Center (1601 Ygnacio Valley Road in the City of Walnut Creek): approximately 1 mile east of the proposed Project Study Limits

- Concord Health Center (2540 East Street in the City of Concord): approximately 2 miles east of the proposed Project Study Limits
- Martinez Health Center (2500 Alhambra Avenue in the City of Martinez): approximately 2 miles west of the proposed Project Study Limits

2.1.7.2 Environmental Consequences

No-Build Alternative

The No-Build Alternative would maintain the current configurations of I-680 in the Community Impact Study Area. Under the No-Build Alternative, the proposed Project would not be constructed, and no impacts on utilities or emergency services would occur. Traffic operations along northbound I-680 would continue to deteriorate as described in Section 2.1.8, *Traffic and Transportation/Pedestrian and Bicycle Facilities*, which could result in increased delays in emergency response times.

Build Alternatives (Alternatives 1C, 2, 3, and 5)

Temporary Impacts

All Build Alternatives include ground disturbance activities during construction, such as demolition, excavation, and drilling, which could cause direct damage to existing utility infrastructure, including electrical wiring, sewer lines, and natural gas pipelines, and could lead indirectly to temporary service interruptions. The Build Alternatives would require relocation of some PG&E overhead electrical and underground gas and electrical lines, Sprint fiber optic conduit, and Comcast cable, as shown in Table 2.1.7-5. The relocations may result in short-term, temporary service interruptions. Final verifications of utilities would be performed during the Project's design phase, and any needed relocations would be coordinated with the affected utility owner. No impacts on water service are anticipated.

Table 2.1.7-5. Preliminary Utility Relocations

Owner	Utility	Post Mile	Relocation (Linear Feet)
PG&E	12kV Overhead Distribution	R15.3	400
Sprint	Fiber Optic Conduit	R20.4	250
PG&E	4-inch Gas Distribution	R20.4	250
PG&E	12kV 2- to 6-inch and 4-inch conduits – Electric Distribution	R20.4	250
Comcast	Cable TV	R20.4	250

Source: (HDR Engineering, Inc., 2023)
Notes: kV = kilovolts; PG&E = Pacific Gas & Electric

Following National Environmental Policy Act (NEPA) approval, the Project Utility Coordinator would contact and inform utility owners of any conflict(s) and request conflict resolution plans. With the implementation of Measure **UES-1**, which would require continuous service to be maintained during the replacement or relocation of affected utilities, and Measure **UES-2**, which would ensure that the location of all underground utilities are identified prior to ground disturbing activities, no temporary substantial direct or indirect adverse impacts on utilities would occur under any of the Build Alternatives. This would include coordination with EBMUD, including pre-construction meetings with East Area Service Center's Superintendent.

As shown in Figure 2.1.7-1, the Project Study Limits are near lands within an LRA and classified as high FHSZ. None of the Build Alternatives would directly expose people or buildings to any new fire hazard areas. In addition, during construction, Measure **UES-3** would be implemented, which would minimize the potential risk of fires and protect the public, construction workers, and the environment by creating defensible spaces around active construction sites.

Emergency services and facilities could be impacted indirectly by temporary disruptions on local circulation and connectivity during construction. Temporary freeway, lane, and ramp closures on I-680 and temporary closures of local streets could be required during construction, which could temporarily affect emergency access. Anticipated closures are summarized for each Build Alternative in Section 1.4.2, *Unique Features of the Build Alternatives*, under *Project Construction*.

The following two long-term ramp closures would be required:

- Alternatives 1C and 3: The southbound Olympic Boulevard off-ramp is anticipated to be closed for up to 11 months.
- Alternatives 2, 3, and 5: The northbound North Main Street off-ramp is anticipated to be closed for up to 1 month.

A Ramp Closure Study was prepared for these long-term ramp closures as part of the Community Impact Assessment (HDR Engineering, Inc., 2023). The proposed project would result in a maximum detour delay of 7.6 minutes due to the temporary closure of the southbound Olympic Boulevard off-ramp and 5.8 minutes due to the temporary closure of the North Main Street off-ramp. In addition, the analysis showed that it was slightly faster (0.7 minute) for vehicles to take the proposed detour to access the Kaiser Permanente Walnut Creek Medical Center rather than the southbound Olympic Boulevard off-ramp. As discussed in Section 1.4.1.6, *Standardized Project Measures*, a Transportation Management Plan (TMP) would be prepared for the Project. The TMP would minimize potential traffic impacts as they relate to staged construction, detours, and other traffic handling concerns associated with construction of the proposed Project under all Build Alternatives.

Therefore, with the incorporation of the Standardized Project Measure, regarding TMP preparation, and the implementation of Measures **UES-1**, **UES 2**, and **UES-3**, no

temporary substantial direct or indirect adverse impacts on utilities or emergency service response times would occur under all Build Alternatives.

Permanent Impacts

No further ground disturbance is anticipated after completion of construction activities. Therefore, no permanent direct or indirect adverse impacts on utilities within the Community Impact Study Area would occur under the Build Alternatives. Traffic operations would result in a reduction in afternoon peak-period congestion and delay on northbound I-680. The proposed Project would directly reduce travel time and improve travel time reliability for travelers in the I-680 corridor, encourage the use of high-occupancy vehicles (HOV) and transit service, optimize the use of the existing HOV lane capacity in the I-680 corridor to better meet current and future traffic demands, and offer non-carpool eligible drivers a reliable travel time option. Thus, overall traffic operations would improve, which could indirectly decrease emergency response times compared to the No-Build Alternative. In addition, Alternatives 1C, 2, and 3 would all add a new CHP observation area at the SR-242 Interchange. Therefore, under the Build Alternatives, the proposed Project could result in permanent direct and indirect beneficial impacts on emergency service response times and demands.

2.1.7.3 Summary

*Alternative 2 has been selected as the preferred alternative. As described above, Alternative 2 would require utility relocations, which would be verified during final design. Measures **UES-1** through **UES-3** would be implemented. In addition, Alternative 2 would result in temporary freeway, lane, and ramp closures on I-680 and temporary closures of local streets during construction, which could temporarily affect emergency access. Alternative 2 would avoid a long-term detour of the Olympic Boulevard off-ramp but would require a 1-month detour of the North Main Street off-ramp, which would result in a maximum delay of up to 5.8 minutes. During final design, a more rigorous analysis of the North Main Street ramp closures would be conducted and a TMP would be developed, which would minimize construction-related delays. Therefore, impacts would not be adverse.*

2.1.7.4 Avoidance, Minimization, and/or Mitigation Measures

UES-1 During construction, Resident Engineer or designated contractor will ensure that utility services for any underground or aboveground utilities that will be disturbed and/or removed during construction of the proposed Project will be maintained to avoid interruptions in service. If interruptions in service are unavoidable, notice will be given, and proper arrangements will be made with the affected residents and businesses.

UES-2 Prior to grading activities, Underground Service Alert (USA) will be notified at least 2 days prior to excavation, by calling 811.

UES-3 To minimize risk of fires during construction activities, Resident Engineer or designated contractor will ensure the implementation of the following minimization measures:

a. Coordinate with CAL FIRE and local fire departments to identify and maintain defensible spaces around active construction areas.

b. Coordinate with CAL FIRE and local fire departments to identify and maintain firefighting equipment (e.g., extinguishers, shovels, water tankers) in active construction areas.

c. Post emergency services phone numbers (i.e., fire, emergency medical, police) in visible locations in all active construction areas.

2.1.8 Traffic and Transportation/Pedestrian and Bicycle Facilities

2.1.8.1 Regulatory Setting

The Department, as assigned by the Federal Highway Administration (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 Code of Federal Regulations [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.

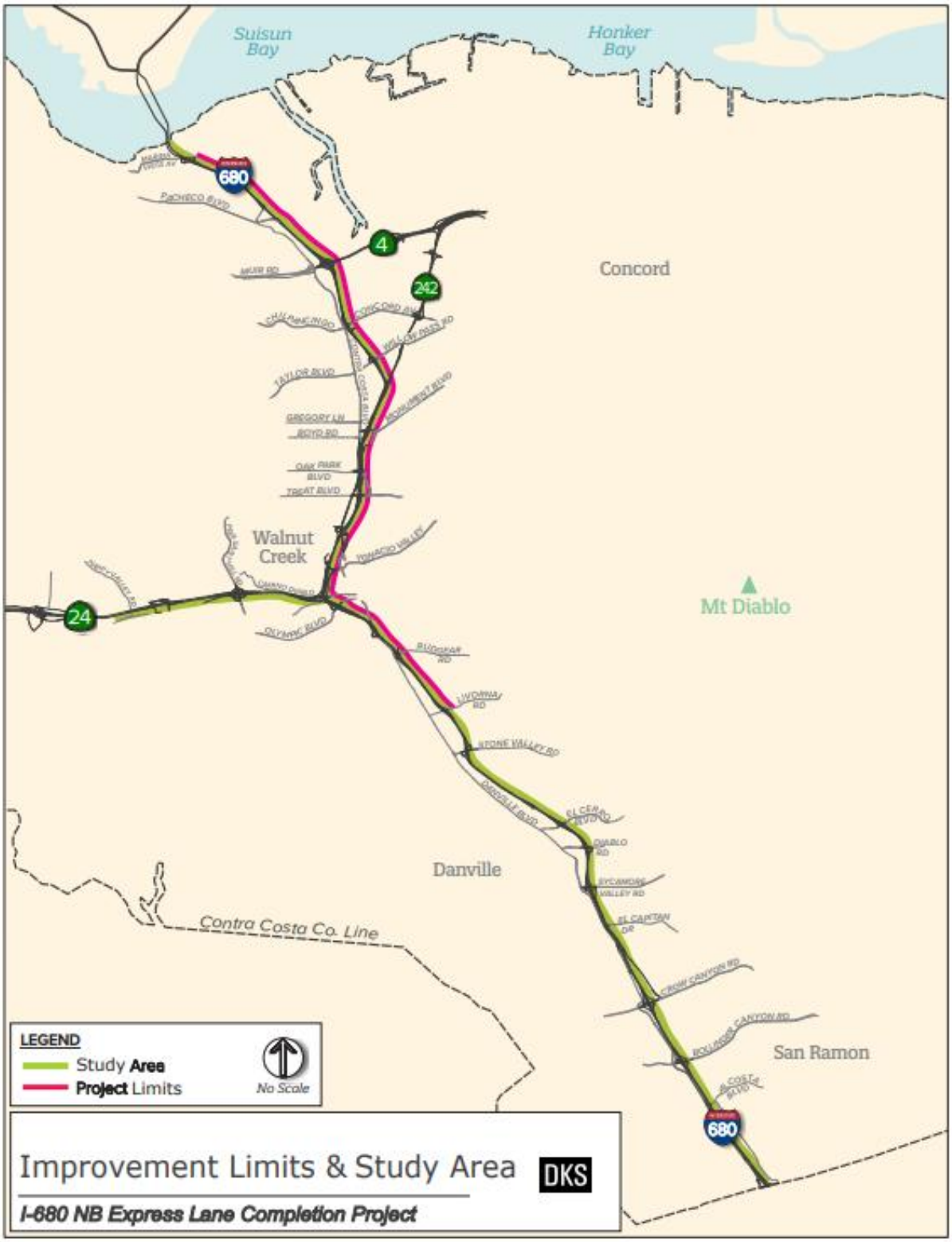
In July 1999, the U.S. Department of Transportation (USDOT) issued an Accessibility Policy Statement pledging a fully accessible multimodal transportation system. Accessibility in federally assisted programs is governed by the USDOT regulations (49 CFR 27) implementing Section 504 of the Rehabilitation Act (29 United States Code [USC] 794). The FHWA has enacted regulations for the implementation of the 1990 Americans with Disabilities Act (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.

2.1.8.2 Affected Environment

This following discussion is based on the proposed Project's *Traffic Operations Analysis Report* (TOAR) (DKS Associates, 2023a), completed in February 2023; *Intersections Operations Analysis* Memorandum (DKS Associates, 2023b), completed in June 2023; and *Community Impact Assessment* (HDR Engineering, Inc., 2023), completed in November 2023.

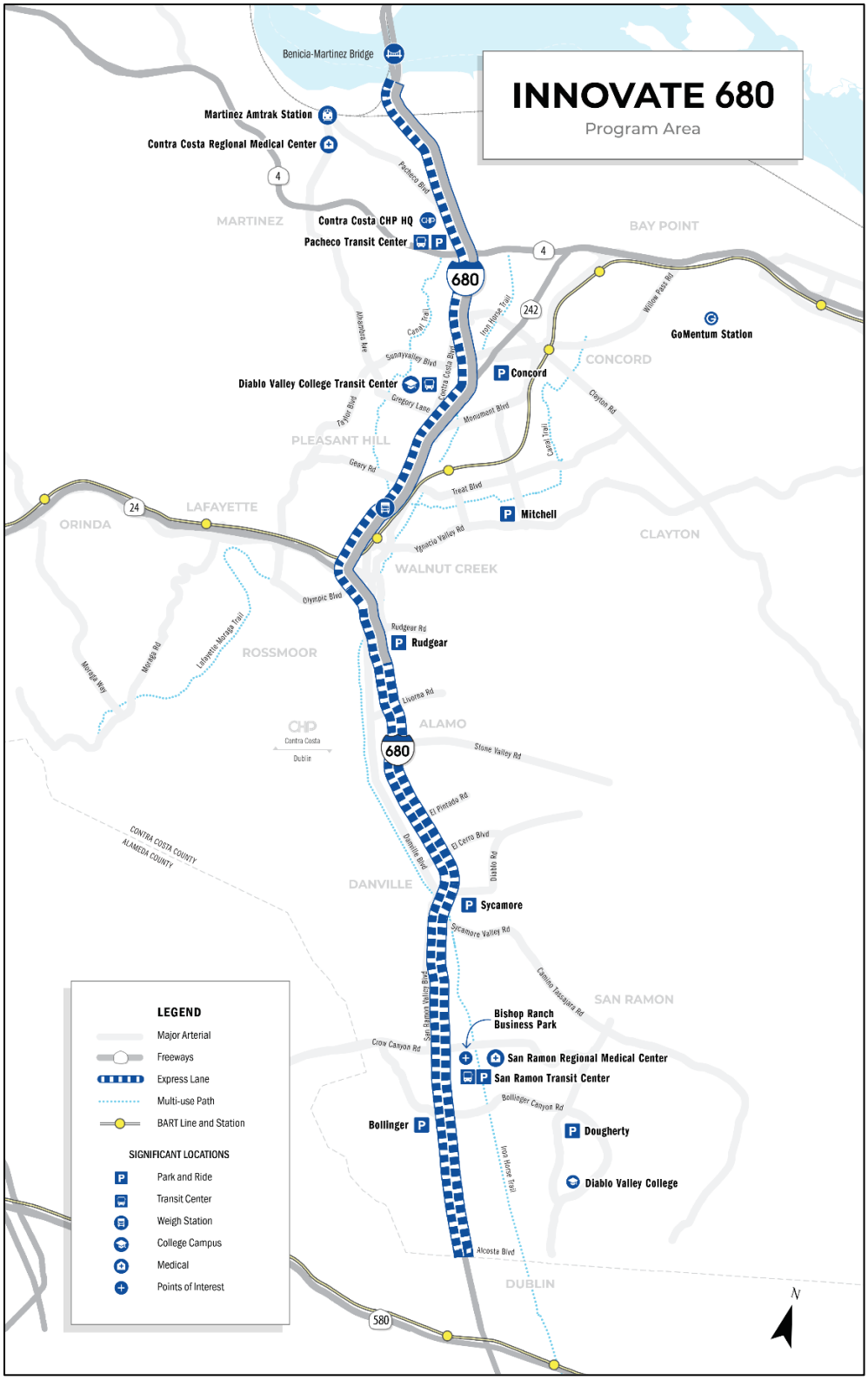
Roadway Network and Traffic Operations Study Area

Interstate 680 (I-680) is a major north-south freeway connecting the Southern San Francisco Bay Area with Interstate 80 (I-80), which crosses the Central Valley, including the Sacramento metropolitan area. I-680 passes through Santa Clara, Alameda, Contra Costa, and Solano Counties. Figure 2.1.8-1 depicts the Traffic Operations Study Area used for the *Traffic Operations Analysis* (DKS Associates, 2023a). The Traffic Operations Study Area extends beyond the Project Study Limits in order to evaluate the Project's transportation and traffic impacts on a broader area. The Traffic Operations Study Area includes northbound I-680 from Alcosta Boulevard to Waterfront Road/Marina Vista Avenue and State Route (SR) 24 from Upper Happy Valley Road to I-680. Figure 2.1.8-2 shows the INNOVATE 680 Program area, which identifies major arterials, Bay Area Rapid Transit (BART) tracks and stations, transit centers, truck scales, and other points of interest along I-680 within Contra Costa County.



Source: (DKS Associates, 2023a)

Figure 2.1.8-1. Traffic Operations Study Area



Source: (Kittelson & Associates and DKS Associates, 2022)

Figure 2.1.8-2. Existing Facilities in INNOVATE 680 Program Area

For the purposes of the TOAR, the improvement limits are from Livorna Road to Waterfront Road/Marina Vista Avenue. The improvement limits, which are different than the Project Study Limits discussed in Chapter 1, represent the area where a managed lane could be added or converted on northbound I-680 based on conceptual designs.[1] The following summarizes the northbound I-680 mainline and on-ramp lane geometries within the improvement limits:

- Between Livorna Road and SR-242 there are between three and six general purpose lanes and no managed lanes (i.e., express lanes or high-occupancy vehicle [HOV] lanes).
- SR-242 to Waterfront Road/Marina Vista Avenue generally has three general purpose lanes and one HOV lane.

South of Livorna Road, there are three general-purpose lanes and an existing express lane in the northbound direction between Alcosta Boulevard and Livorna Road.

Northbound I-680 is supplemented with auxiliary lanes between interchanges at the following locations:

- Willow Pass Road to Burnett Avenue
- Treat Boulevard to Monument Boulevard
- Lawrence Way to Treat Boulevard
- Diablo Road to El Cerro Boulevard
- Bollinger Canyon Road to Crow Canyon Road

There are also existing express lanes on southbound I-680 within the Traffic Operations Study Area.

Traffic Operations Analysis

The traffic operations analysis methodology was developed in coordination with the California Department of Transportation (Caltrans). The traffic study analyzed the following scenarios for the No-Build and Build scenarios (DKS Associates, 2023a):

[1] As discussed in Section 1.4.7, *Alternatives Considered but Eliminated*, the Project Study Limits were extended south of Livorna Road to accommodate a potential buffer (Design Option A), which was eliminated from consideration during the preparation of the TOAR.

- Existing Year (2019) conditions,[2]
- Opening Year (2027), which represents the Project's anticipated Opening Year,
- Design Year (2047), 20 years after the Opening Year.

The analysis analyzed the 2-hour morning (7:00 a.m. to 9:00 a.m.) and 6-hour afternoon (2:00 p.m. to 8:00 p.m.) peak analysis periods. The morning and afternoon peak analysis periods were selected based on the level and duration of northbound I-680 congestion in the Traffic Operations Study Area. Traffic counts were performed along the I-680 corridor from November 12 to 14, 2019.

Forecasting Methodology

The Contra Costa Transportation Authority (CCTA) Travel Demand Model (Countywide Model) was used for traffic forecasting. The Countywide Model includes representation of HOV lanes but not express lanes. Therefore, the model was modified to better reflect express lane modeling for the purposes of this Project.

It was assumed that the express lane pricing for any period would be set so that the number of vehicles (HOVs plus toll vehicles) would not exceed 1,650 vehicles per hour per lane. The desired maximum volume for an express lane of 1,650 vehicles per hour was used because this is the maximum volume that would still allow uncongested traffic flow in an express lane. The travel model's HOV percentage estimates were checked with available vehicle occupancy data. Adjustments were further made to the model's vehicle trip tables so that the HOV percentages would be closer to observed vehicle occupancy surveys.

The Countywide Model's traffic validation was based on several criteria, including volume by screenline, volume by road type, root mean square error, and correlation coefficient. The validation focused on peak period traffic volumes and peak hour traffic volumes. The validation tests were based on FHWA example guidelines documented in the *Travel Model Validation and Reasonability Checking Manual,* Second Edition (2010).

The Countywide Model was updated in 2019 to include land use and demographic inputs consistent with the then-currently adopted Metropolitan Transportation Commission (MTC) Regional Transportation Plan and Sustainable Communities

[2] Due to the novel COVID-19 emergency, 2019 traffic data was used to more accurately reflect and compare anticipated future traffic conditions for the Opening Year and Design Year instead of 2020 traffic data. The air quality and noise analyses, which are discussed in Section 2.2.6, *Air Quality,* and Section 2.2.7, *Noise and Vibration*, respectively, used 2019 traffic data projected to 2020 as the existing conditions.

Strategy (RTP/SCS), *Plan Bay Area 2040*.[3] The Project's Design Year (2047) is beyond the 2040 Horizon Year for *Plan Bay Area 2040*. As such, the following method was used to develop the detailed Design Year (2047) land use inputs by traffic analysis zone, which resulted in a database of 2047 model inputs for all land use and demographic variables:

1. Extrapolate Countywide Model land use inputs to 2047.
2. Identify 2047 county population control totals using California Department of Finance forecasts, which were determined to be the best available source for projections beyond 2040.
3. Adjust the 2047 extrapolation to be consistent with the 2047 population control totals.

Road and transit network assumptions were based on the CCTA Transportation Expenditure Plan No-Build scenario, which was based on a detailed review of committed and funded projects prepared by CCTA in 2019. This assumed no additional funding from the proposed *Measure J Transportation Expenditure Plan*. As Measure J was not approved in the March 2020 election, the Transportation Expenditure Plan No-Build scenario was determined to provide the best estimate of realistic transportation improvements for future years.

The following planned transportation improvements were included in the Transportation Expenditure Plan No-Build scenario for Opening Year (2027):

- Southbound I-680 HOV lane North Main Street to Livorna Road
- Southbound I-680 Express Lane from Marina Vista to Livorna Road (Convert HOV lane)
- I-680/SR-4 Interchange improvements phases 1–3

The following planned improvement was also added to the travel model:

- Implementation of northbound I-680 express lane from SR-237 in Santa Clara County to SR-84 in Pleasanton, operational as of 2025

The following additional planned transportation improvements were included in the Transportation Expenditure Plan No-Build scenario for Design Year (2047):

- SR-242/Clayton Road on/off-ramps (by 2030)

[3] Existing conditions were modeled prior to the release of *Plan Bay Area 2050* (Association of Bay Area Governments and Metropolitan Transportation Commission, 2021).

- Ferry service from Antioch, Martinez, and Hercules to San Francisco
- I-680 express bus service and Park-and-Ride lots between Dublin BART station and Martinez (referred to in the travel model as route 680X), which was updated to include a connection to the Martinez Intermodal Station
- BART Transbay Corridor Core Capacity Program, which is assumed to decrease peak period headways from 15 minutes to 10 minutes (off-peak headways are assumed to remain at 15 minutes)
- BART extension to Santa Clara

The following additional planned improvement was added to the travel model:

- Implementation of northbound and southbound I-680 express lanes between SR-84 in Pleasanton and Alcosta Boulevard, operational as of 2030

The Countywide Model did not include ramp metering on the I-680 corridor. Consistent with Caltrans' plans to implement ramp metering on I-680, ramp metering was coded on northbound and southbound on-ramps in the corridor for all future No-Build and Build scenarios, including the Opening Year (2027) conditions. Assumptions regarding the number of lanes were based on information provided by Caltrans and the *I-680 Ramp Metering Project Initiation Document*.

For the purposes of travel demand modeling, select ramps were assumed to operate with all metered, general-purpose lanes rather than one or more general-purpose lane and one or more HOV lane. This assumption was necessary to prevent the travel demand model from imposing unrealistic constraints on on-ramp access and possibly prevent demand from entering the freeway. Adjustments were based on comparisons of maximum metered ramp capacities with both 2019 traffic counts and 2020 model-assigned ramp volumes.

An incremental adjustment based on traffic counts, followed by additional volume adjustments to ensure that there would be no illogical decreases in traffic volumes, were used to forecast the No-Build scenarios for the Opening Year (2027) and Design Year (2047). Once the No-Build forecasts were established, the traffic forecasts for each Build Alternative were calculated based on their differences from the No-Build Alternative.

Operational Analysis Methodology

The operational analysis for the Project was conducted using the VISSIM™ simulation modeling platform. The VISSIM™ models were developed for both the morning (7:00 a.m. to 9:00 a.m.) and afternoon (2:00 p.m. to 8:00 p.m.) peak analysis periods with a 1-hour network loading period. The number of lanes, vehicle restrictions, and the location of lane additions and drops were confirmed by field observations.

The base model developed for existing conditions was calibrated and validated by comparing model-produced results/outputs to independent data/targets to determine the acceptability of model performance. The VISSIM™ model was validated to existing conditions using the criteria suggested in *Traffic Analysis Toolbox Volume III: Guidelines for Applying Traffic Microsimulation Modeling Software*. The existing conditions traffic analysis model was validated to observed traffic counts, travel times, bottleneck locations, and queues. The calibrated and validated existing conditions models were modified to reflect the assumed corridor network changes and match the forecasted traffic demands for the Opening Year (2027) and Design Year (2047). The future year VISSIM™ models were used to evaluate the benefits and impacts of each Project alternative.

The TOAR analyzed the following system-wide performance measures, called measures of effectiveness, to provide an understanding of overall traffic operations and help compare the No-Build and Build scenarios:

- Congestion and Queue Characteristics: Assessment of freeway and ramp congestion patterns, including the location of bottlenecks and the duration and severity of queues.
- Freeway Segment Speed: Both in the managed lane and general-purpose lanes. Reported for all freeway segments within the Traffic Operations Study Area (15-minute interval).
- Freeway Segment Travel Times: Both in the managed lane and general-purpose lanes. Reported for all freeway segments within the Traffic Operations Study Area (1-hour interval).
- Travel Time Savings (Managed Lane): Travel time savings for managed lane users versus general-purpose lane users.
- Vehicle Hours of Delay (VHD): Total VHD, relative to travel at free-flow speed (65 miles per hour [mph]). Includes the entire VISSIM™ model network (freeway and ramps). Reported for both the Traffic Operations Study Area and the improvement limits.
- Maximum Individual Delay: Maximum vehicle delay representing the peak level of congestion during the study period for general-purpose and managed lanes.
- Vehicle Throughput: Total number of vehicles passing through (demand served) preselected points on the freeway and ramps; reported for the study period.
- Person Throughput: Total number of persons (all modes) passing through preselected points on the freeway and ramps; reported for the study period.

- Freeway Segment Level of Service (LOS): Based on traffic density (vehicles per mile per lane) along managed and general-purpose lanes. LOS represents the perspective of drivers and is an indication of the comfort and convenience associated with driving.

There was an observed bottleneck that developed outside the Project Study Limits, north of El Pintado Road. This bottleneck is referred to as the El Pintado Road bottleneck. The measures of effectiveness ultimately included operational impacts from the El Pintado Road bottleneck, which reduces some benefits of Alternatives 1C, 2, and 3. Since the El Pintado Road bottleneck would occur in all Build Alternatives, delay metrics north of Livorna Road were also evaluated.

Level of Service Methodology

Freeway operating conditions within the Traffic Operations Study Area were evaluated using procedures and methodologies consistent with the *Highway Capacity Manual*, 6th Edition (Transportation Research Board, 2016). There are four analysis types for a freeway: basic, weaving, merge (on-ramp), and diverge (off-ramp). The LOS analysis for basic freeway segments requires that the segment has uniform traffic and roadway characteristics (e.g., the same number of lanes, grade change of less than 2 percent, same speed limit). The density for a basic freeway segment is calculated across all lanes for the entire segment.

A freeway segment is considered a weave when an on-ramp is followed by an off-ramp less than 3,000 feet apart. The density for a weave segment is also calculated across all lanes. On-ramp and off-ramp density is only calculated for the shoulder and adjacent freeway lanes. The influence area of an on-ramp is 1,500 feet downstream of the gore point (i.e., the triangular area between the mainline and a ramp) and 1,500 feet upstream for an off-ramp.

Table 2.1.8-1 provides the thresholds for LOS from the *Highway Capacity Manual*, 6th Edition (Transportation Research Board, 2016). LOS varies from LOS A (indicating free-flow traffic conditions with little or no delay) to LOS F (representing over-saturated conditions when traffic flows exceed capacity and a bottleneck develops resulting in stop-and-go conditions upstream/approaching the bottleneck). LOS E represents "at-capacity" operation. VISSIM™ models were used to determine density and then calculate LOS. Existing and forecasted LOS are provided in Appendix K, *Level of Service and Delay*.

Table 2.1.8-1. Intersection Level of Service Thresholds

Level of Service	Maximum Density (Passenger Cars Per Mile Per Lane)		
	Basic Freeway/ Highway Sections	Freeway Weaving Segments	Ramp Junctions
A	≤ 11	≤ 10	≤ 10

Level of Service	Maximum Density (Passenger Cars Per Mile Per Lane)		
	Basic Freeway/ Highway Sections	Freeway Weaving Segments	Ramp Junctions
B	> 11–18	> 10–20	> 10–20
C	> 18–26	> 20–28	> 20–28
D	> 26–35	> 28–35	> 28–35
E	> 35–45	> 35–43	> 35
F	Demand Exceeds Capacity	Demand Exceeds Capacity	Demand Exceeds Capacity

Source: (Transportation Research Board, 2016)

Vehicle Miles Traveled Methodology

Caltrans *Transportation Analysis Under CEQA* (TAC) and *Transportation Analysis Framework* (TAF), both first published in September 2020, provided vehicle miles traveled (VMT) analysis guidance (California Department of Transportation, 2020a; 2020b). The guidance indicates that projects that would add capacity to the highway system must consider the effects of induced travel that could result from the travel time savings provided by the capacity increases. This section describes the adjustments to the travel demand model process that account for the induced demand.

The analysis applied a model benchmarking approach to provide VMT analysis for the Project. The benchmarking methodology included the following steps:

- Apply the National Center for Sustainable Transportation (NCST) Induced Travel Calculator (NCST Calculator) for a hypothetical general purpose lane addition in the same location as the Project and identify induced VMT.
- Add the same hypothetical general-purpose lane to the Countywide Model and identify the trips that would benefit from the lane addition.
- Apply factors within the travel model to increase the trips that would benefit from the lane addition at an order of magnitude equal to the VMT increase estimated by the NCST Calculator.
- Make the factors proportional to travel time savings (between the No-Build scenario and the express lane addition scenario) so that the trip and VMT increases can be scaled to alternatives that provide different amounts of travel time savings.
- Apply the travel model, with the induced VMT factor formulas, to the Project alternatives.

As described further in the California Environmental Quality Act (CEQA) Evaluation (Section 3.2.17, *Transportation*), VMT is the primary means for determining transportation impacts under CEQA. Daily VMT are reported for the five-county Metropolitan Statistical Area, which includes Alameda, Contra Costa, Marin, San Francisco, and San Mateo Counties.

For the purposes of determining CEQA impacts, VMT impacts were forecasted for the five county Metropolitan Statistical Area. For purposes of the traffic operation analysis in this section, VMT impacts were forecasted for the corridor within the improvement limits using the VISSIM™ Model. The corridor VMT impacts described in Section 2.1.8.3, *Environmental Consequences*, are a subset of the impacts on the larger regional Metropolitan Statistical Area that is described in Section 3.2.17, *Transportation*.

Managed Lane Volumes and Percentage

Two segments of northbound I-680 within the Traffic Operations Study Area already have managed lanes: An express lane from south of Alcosta Boulevard to south of Livorna Road and an HOV lane with a two-plus minimum occupancy requirement from north of the SR-242 Interchange to south of Waterfront Road/Marina Vista Avenue. Five mainline count locations were placed along these stretches of the corridor, and the volume by lane-type data was captured. This set of count data was then used to calculate the managed lane volume percentage, which illustrates the relative proportion of vehicles using the managed lanes over the vehicles using all mainline lanes, including the managed lane and general-purpose lanes. Table 2.1.8-2 presents a summary of the lane volumes for managed lanes.

Table 2.1.8-2. Existing Managed Lanes Volumes and Percentages

Count Location	Lane Config.	Morning Peak Period		Afternoon Peak Period					
		7–8 AM	8–9 AM	2–3 PM	3–4 PM	4–5 PM	5–6 PM	6–7 PM	7–8 PM
Between Waterfront Road/Marina Vista Avenue and Arthur Road	1HOV; 3GP	789 (23%)	726 (22%)	1,305 (33%)	1,230 (27%)	1,595 (32%)	1,655 (33%)	1,293 (32%)	1,016 (33%)
Between SR-4 and Concord Avenue	1HOV; 3GP	158 (4%)	188 (5%)	736 (14%)	549 (10%)	842 (15%)	1,005 (18%)	602 (12%)	646 (15%)
North of El Pintado Road	1EL; 3GP	1,246 (18%)	1,440 (23%)	945 (17%)	1,315 (21%)	1,486 (26%)	1,366 (25%)	1,131 (22%)	462 (12%)
North of Crow Canyon Road	1EL; 4GP	844 (14%)	786 (14%)	733 (15%)	811 (14%)	892 (15%)	911 (15%)	553 (11%)	379 (9%)

Count Location	Lane Config.	Morning Peak Period		Afternoon Peak Period					
		7–8 AM	8–9 AM	2–3 PM	3–4 PM	4–5 PM	5–6 PM	6–7 PM	7–8 PM
North of Alcosta Boulevard	1EL; 4GP	833 (13%)	1,032 (16%)	1,173 (27%)	784 (15%)	1,128 (22%)	713 (12%)	455 (8%)	347 (8%)

Source: (DKS Associates, 2023a)
Notes: Config. = configuration; EL = express lane; GP = general-purpose lane; HOV = high-occupancy vehicle; PM = post mile; SR = State Route

Vehicle Occupancy Counts

During the data collection effort, 6 hours of vehicle occupancy counts were collected (3 hours during morning peak period and 3 hours during the afternoon peak period). This was done at a total of five locations along the study corridor. Vehicle occupancies are summarized in Table 2.1.8-3. The occupancies are split into two categories: single-occupancy vehicles (SOV) and two-plus occupancy vehicles (HOV2+).

Table 2.1.8-3. Vehicle Occupancy Counts

Location & Lane Type		Morning (7–10 AM)[1]			Afternoon (3–6 PM)[2]		
		Flow	SOV	HOV2+	Flow	SOV	HOV2+
South of Marina Vista Avenue	GP	9,895	65.3%	34.7%	14,476	63.3%	36.7%
South of SR-4	GP	11,529	63.0%	37.0%	14,735	64.4%	35.6%
	HOV[1]	593	44.2%	55.8%	2,383	46.4%	53.6%
Treat Boulevard	GP	19,217	74.6%	25.4%	23,503	76.4%	23.6%
Between Crow Canyon Road and Sycamore Valley Road	GP	16,315	92.1%	7.9%	17,827	92.2%	7.8%
	EL	1,897	69.8%	30.2%	2,228	59.8%	40.2%
Between Alcosta Boulevard and Crow Canyon Road	GP	18,286	91.2%	8.8%	16,402	89.2%	10.8%
	EL	1,979	73.9%	26.1%	2,302	72.2%	27.8%

Source: (DKS Associates, 2023a)

Notes: EL = express lane; GP = general-purpose lane; HOV2+ = high-occupancy vehicle, two-plus; SOV = single-occupancy vehicle; SR = State Route
[1] Morning Peak Period: 29.2 percent of SOV had Clean Air Vehicle stickers and 15 percent of vehicles were violators.
[2] Afternoon Peak Period: 28.5 percent had Clean Air Vehicle stickers and 17.8 percent of vehicles were violators.

Vehicle Classification

Vehicle classification was recorded at each of the mainline count locations along the corridor. The vehicles were separated into "Passenger Car" and "Heavy Vehicle" categories based on FHWA's vehicle classification (i.e., vehicles in classes 1 through 3 were considered Passenger Cars; vehicles in classes 4 through 13 were considered Heavy Vehicles). Table 2.1.8-4 summarizes the vehicle classifications observed during the morning and afternoon peak periods.

Table 2.1.8-4. Vehicle Classification

Count Location	Morning Peak Period		Afternoon Peak Period	
	Passenger Car	Heavy Vehicle	Passenger Car	Heavy Vehicle
North of Benicia-Martinez Bridge Toll Plaza	95%	5%	98%	2%
Between Arthur Road and Waterfront Road/Marina Vista Avenue	95%	5%	98%	2%
Between SR-4 and Concord Avenue	97%	3%	98%	2%
Between Willow Pass Road and SR-242	97%	3%	98%	2%
Between North Main Street and Monument Boulevard	97%	3%	98%	2%
Between Ygnacio Valley Road and Treat Boulevard	97%	3%	98%	2%
Between SR-24 and Ygnacio Valley Road	97%	3%	98%	2%
Between Rudgear Road and Olympic Boulevard	95%	5%	97%	3%
Between Livorna Road and Rudgear Road	95%	5%	97%	3%
Between El Pintado Road and Stone Valley Road	95%	5%	98%	2%
Between Crow Canyon Road and Sycamore Valley Road	94%	6%	98%	2%
Between Alcosta Boulevard and Bollinger Canyon Road	94%	6%	98%	2%
Between Amador Valley Boulevard and Alcosta Boulevard	94%	6%	98%	2%

Source: (DKS Associates, 2023a)
Note: SR = State Route

Corridor Segment Travel Times

The floating car travel time survey (tachograph runs) method was used to collect freeway travel time data on managed lanes along the I-680 corridor. Travel time surveys were conducted in November 2019 from 6:00 a.m. to 10:00 a.m. and from 3:00 p.m. to 7:00 p.m. Given the varying lane configurations along the corridor (i.e., the presence of a managed lane), the entire northbound I-680 was segregated into three segments, split at the breaking point of the managed lane, as follows:

- Southern Segment: Between Alcosta Boulevard and Livorna Road. This segment encompasses both general-purpose and express lanes.
- Middle Segment: Between Livorna Road and north of the SR-242 Interchange. This segment is composed of general-purpose lanes.
- Northern Segment: Between north of the SR-242 Interchange and Waterfront Road/Marina Vista Avenue. This segment is composed of both general-purpose and HOV lanes.

Table 2.1.8-5 summarizes the average travel times on general-purpose lanes and managed lanes for northbound I-680 during both morning and afternoon survey periods, as well as the total corridor travel time when traveling on general-purpose and managed lanes.

Congestion Patterns and Bottlenecks

Recurrent traffic bottlenecks are sections along a freeway corridor where traffic demand exceeds the freeway's capacity and, as a result, cause traffic queueing (i.e., congestion) and delays to motorists approaching the bottleneck sections.

The existing condition congestion patterns and bottleneck discussion are based on corridor information collected in 2019. The existing bottleneck locations were identified and verified using several sources. Caltrans PeMS and INRIX Roadway traffic speed data were used to identify bottleneck locations and the extent and duration of traffic queues approaching them. Field reviews and travel time runs were also conducted to further identify and confirm the bottleneck locations and associated queuing. No morning recurring peak period bottlenecks were observed. Four recurring bottlenecks were observed during the afternoon peak period, which are described in Table 2.1.8-6.

Table 2.1.8-5. Northbound I-680 Average Travel Times

Segment	Lane Type	Segment length (mile)	Morning				Afternoon			
			6–7 AM	7–8 AM	8–9 AM	9–10 AM	3–4 PM	4–5 PM	5–6 PM	6–7 PM
Northern Segment	GP	11.5	05:08	05:10	05:16	05:20	05:12	05:37	07:35	05:44
	HOV		04:22	04:19	04:16	04:14	04:40	04:54	04:42	04:51
Middle Segment	GP	7.1	06:11	06:25	06:50	06:45	13:26	18:45	23:21	20:41
Southern Segment	GP	6.1	10:56	12:27	18:40	15:41	13:42	19:29	22:40	19:26
	EL		10:46	10:58	11:07	11:46	11:58	12:31	12:01	11:24
Total Corridor	**GP**	**24.7**	**22:15**	**24:02**	**30:46**	**27:46**	**32:20**	**43:51**	**53:36**	**45:51**
	ML		**21:19**	**21:42**	**22:13**	**22:45**	**30:04**	**36:10**	**40:04**	**36:56**

Source: (DKS Associates, 2023a)
Notes: EL = express lane; GP = general-purpose lane; HOV = high-occupancy vehicle lane; ML = managed lane

Table 2.1.8-6. Recurrent Bottlenecks Along the Northbound I-680 Corridor for Exiting Conditions (2019)

Bottleneck Location	Possible Cause	Duration
Afternoon Peak Period		
El Pintado Road on-ramp to Stone Valley Road off-ramp	Due to high mainline demand and on-ramp volumes	This location develops as a controlling bottleneck at approximately 3:30 p.m. and is sustained until approximately 4:15 p.m. before becoming hidden in queues from downstream bottlenecks. This freeway section also develops as a controlling bottleneck later in the peak period, between approximately 6:30 and 6:45 p.m., when queues from the downstream bottlenecks recede to north of the Stone Valley Road Interchange. The queues during the time this section is a controlling bottleneck extending south approximately 4.5 miles to the Crow Canyon Road Interchange.
Lawrence Way on-ramp to Treat Boulevard off-ramp	Due to high mainline and ramp demand and reduced mainline capacity associated with the heavy weaving volumes between the Lawrence Way on-ramp and the Treat Boulevard off-ramp.	Traffic demand exceeds this bottleneck's capacity by 2:00 p.m., and upstream queues begin to develop. This bottleneck becomes hidden by 4:30 p.m. when queues from the downstream bottleneck north of the Oak Road on-ramp reach this segment. As queues recede to north of Treat Boulevard around 6:45 p.m, this freeway section again becomes a controlling bottleneck until approximately 7:30 p.m. Maximum queues during the period when this is a controlling bottleneck extend approximately 3.5 miles south to the Rudgear Road off-ramp.
Oak Road on-ramp to Contra Costa Boulevard off-ramp	Due to a combination of high mainline volume and reduced mainline capacity due to the heavy weaving volumes between the Oak Road on-ramp and Contra Costa Boulevard off-ramp.	This section develops briefly as a controlling bottleneck around 3:45 p.m. Maximum queues from this bottleneck extend to the upstream bottleneck between the Lawrence Way on-ramp and Treat Boulevard off-ramp (approximately 1.5 miles) around 4:00 p.m. before receding.
SR-242 off-ramp	Congestion on northbound SR-242 extends onto northbound I-680 and reduces the capacity of this segment of northbound I-680 approaching the SR-242 off-ramp.	This bottleneck develops intermittently between 4:30 p.m. and 6:00 p.m. when queues from SR-242 extend onto northbound I-680 and reduce the freeway capacity. During this period, queues typically extend into the Oak Road on-ramp to Contra Costa Boulevard off-ramp bottleneck, resulting in it becoming hidden for brief periods.

Source: (DKS Associates, 2023a)
Note: I-680 = Interstate 680; SR = State Route

Collision History

Collision data from the Caltrans Traffic Accident Surveillance and Analysis System (TASAS) of the Caltrans Transportation System Network were evaluated for I-680 between PM R11.0 and PM 25.0 for a 3-year period between January 1, 2021, and December 31, 2023. TASAS also generates Table C, a yearly report that uses segmental selection criteria combined with statistical analysis to identify the high-collision concentration locations on the State highway system. There were no non-congestion-related Table C (i.e., high-collision) locations identified on northbound I-680 between January 1, 2021, and December 31, 2023.

A Traffic Safety Analysis Report was approved in July 2022, which was subsequently appended to include Alternative 5 in January 2023. Collision analyses were performed for the following six segments and are summarized in Table 2.1.8-7 through Table 2.1.8-12 (below):

- Segment 1: Northbound I-680 from Livorna Road Undercrossing (PM R11.28) to north of Olympic Boulevard Undercrossing (PM 14.08) (Table 2.1.8-7)
- Segment 2: Northbound I-680 from north of Trinity Avenue Overcrossing (PM 14.7) to Treat Boulevard Overcrossing (PM 16.4) (Table 2.1.8-8)
- Segment 3: Northbound I-680 from Treat Boulevard Overcrossing (PM 16.4) to north of I-680/SR-242 Junction (PM R19.1) (Table 2.1.8-9)
- Segment 4: Northbound I-680 from north of I-680/SR-242 Junction (PM R19.1) to I-680/SR-4 Junction (PM 21.2) (Table 2.1.8-10)
- Segment 5: Northbound I-680 from I-680/SR-4 Junction (PM R21.2) to north of Arthur Road (PM 23.2) (Table 2.1.8-11)
- Segment 6 (Alternatives 1C and 3): Southbound I-680 from North Main Street Overcrossing (PM 15.6) to south of South Main Street Undercrossing (PM 12.65) (Table 2.1.8-12)

Strategies were incorporated into the Project design for each Build Alternative based on the evaluation of the collision and traffic data with the proposed and expected changes in operating and infrastructure conditions. These strategies included design requirements for delineation (e.g., traffic striping, reflective markers, surface treatments), lighting, and median barriers.

Table 2.1.8-7. I-680 Northbound Collision History – Segment 1

Collision Summary						Actual Collision Rate (Colls/MVM)			Statewide Average Collision Rate (Colls/MVM)		
Location	Post Mile	Number of Collisions									
		Total	PDO	I	F	Total	F	F + I	Total	F	F + I
I-680 NB	R11.28 to 14.08	210	143	67	0	0.91	0.00	0.29	1.06	0.004	0.34

Notes: F = Fatal; I= Injury; PDO=Property Damage Only; Colls = Collisions; MVM = Million Vehicles Miles
Source: Caltrans Traffic Collision Surveillance and Analysis System Database from January 1, 2021, and December 31, 2023

Table 2.1.8-8. I-680 Northbound Collision History – Segment 2

Collision Summary						Actual Collision Rate (Colls/MVM)			Statewide Average Collision Rate (Colls/MVM)		
Location	Post Mile	Number of Collisions									
		Total	PDO	I	F	Total	F	F + I	Total	F	F + I
I-680 NB	14.70 to 16.40	250	175	74	1	1.31	0.005	0.39	1.21	0.004	0.38

Notes: F = Fatal; I= Injury; PDO=Property Damage Only; Colls = Collisions; MVM = Million Vehicles Miles
Source: Caltrans Traffic Collision Surveillance and Analysis System Database from January 1, 2021, and December 31, 2023

Table 2.1.8-9. I-680 Northbound Collision History – Segment 3

Collision Summary						Actual Collision Rate (Colls/MVM)			Statewide Average Collision Rate (Colls/MVM)		
Location	Post Mile	Number of Collisions									
		Total	PDO	I	F	Total	F	F + I	Total	F	F + I
I-680 NB	16.40 to R19.10	336	232	104	0	1.00	0.00	0.31	1.22	0.004	0.38

Notes: F = Fatal; I= Injury; PDO=Property Damage Only; Colls = Collisions; MVM = Million Vehicles Miles
Source: Caltrans Traffic Collision Surveillance and Analysis System Database from January 1, 2021, and December 31, 2023

Table 2.1.8-10. I-680 Northbound Collision History – Segment 4

Collision Summary						Actual Collision Rate (Colls/MVM)			Statewide Average Collision Rate (Colls/MVM)		
Location	Post Mile	Number of Collisions									
		Total	PDO	I	F	Total	F	F + I	Total	F	F + I
I-680 NB	R19.10 to 21.20	195	137	57	1	1.10	0.006	0.33	1.06	0.004	0.34

Notes: F = Fatal; I= Injury; PDO=Property Damage Only; Colls = Collisions; MVM = Million Vehicles Miles
Source: Caltrans Traffic Collision Surveillance and Analysis System Database from January 1, 2021, and December 31, 2023

Table 2.1.8-11. I-680 Northbound Collision History – Segment 5

Collision Summary						Actual Collision Rate (Colls/MVM)			Statewide Average Collision Rate (Colls/MVM)		
Location	Post Mile	Number of Collisions									
		Total	PDO	I	F	Total	F	F + I	Total	F	F + I
I-680 NB	21.20 to 23.2	56	32	23	1	0.44	0.008	0.19	1.01	0.004	0.32

Notes: F = Fatal; I= Injury; PDO=Property Damage Only; Colls = Collisions; MVM = Million Vehicles Miles
Source: Caltrans Traffic Collision Surveillance and Analysis System Database from January 1, 2021, and December 31, 2023

Table 2.1.8-12. I-680 Northbound Collision History – Segment 6

Collision Summary						Actual Collision Rate (Colls/MVM)			Statewide Average Collision Rate (Colls/MVM)		
Location	Post Mile	Number of Collisions									
		Total	PDO	I	F	Total	F	F + I	Total	F	F + I
I-680 SB	R12.65 to 15.60	213	138	75	0	0.86	0.000	0.30	1.09	0.005	0.35

Notes: F = Fatal; I= Injury; PDO=Property Damage Only; Colls = Collisions; MVM = Million Vehicles Miles
Source: Caltrans Traffic Collision Surveillance and Analysis System Database from January 1, 2021, and December 31, 2023

Bicycle and Pedestrian Facilities

There are no designated bicycle or pedestrian facilities on northbound I-680 in the Project Study Limits. The pedestrian circulation system's primary components are sidewalks and crosswalks. Most of the developed properties adjacent to I-680 are improved with sidewalks.

Numerous bicycle facilities intersect or are adjacent to I-680. Figure 2.1.8-3 identifies the locations of existing and planned bikeways in the Community Impact Study Area, The Community Impact Study Area is described further in Section 2.1.1, Existing and Future Land Use. As described further in Section 2.1.3, Parks and Recreational Facilities, the Iron Horse Regional Trail crosses under I-680 at the Rudgear Road Undercrossing and again at Laurel Drive. The Iron Horse Regional Trail is also parallel to northbound I-680 and crosses under SR-242 at the I-680/SR-242 Interchange. In addition, the Contra Costa Canal Trail/Briones to Mt. Diablo Regional Trail crosses under I-680 at the Contra Costa Canal Undercrossing.

Parking

Much of the Community Impact Study Area is characterized by highway-adjacent urban residential neighborhoods and commercial and light industrial properties. There are multiple parking options consisting of on-street and off-street parking in residential areas and usually plentiful off-street surface parking at commercial lots.

Park-and-ride lots are used to encourage carpooling along I-680. According to MTC, the following five existing park-and-ride lots are located within the Community Impact Study Area (see Figure 2.1.8-4) with the number of parking spaces provided in parentheses (Metropolitan Transportation Commission, 2023):

- Martinez, Pacheco Boulevard and Blum Road (57)
- Concord, Willow Pass Road and Market Street (44)
- Pleasant Hill, Treat Boulevard and Oak Road (2,907)
- Walnut Creek, Rudgear Road and I-680 (63)
- Town of Danville, Danville Sycamore Valley Park and Ride (230)

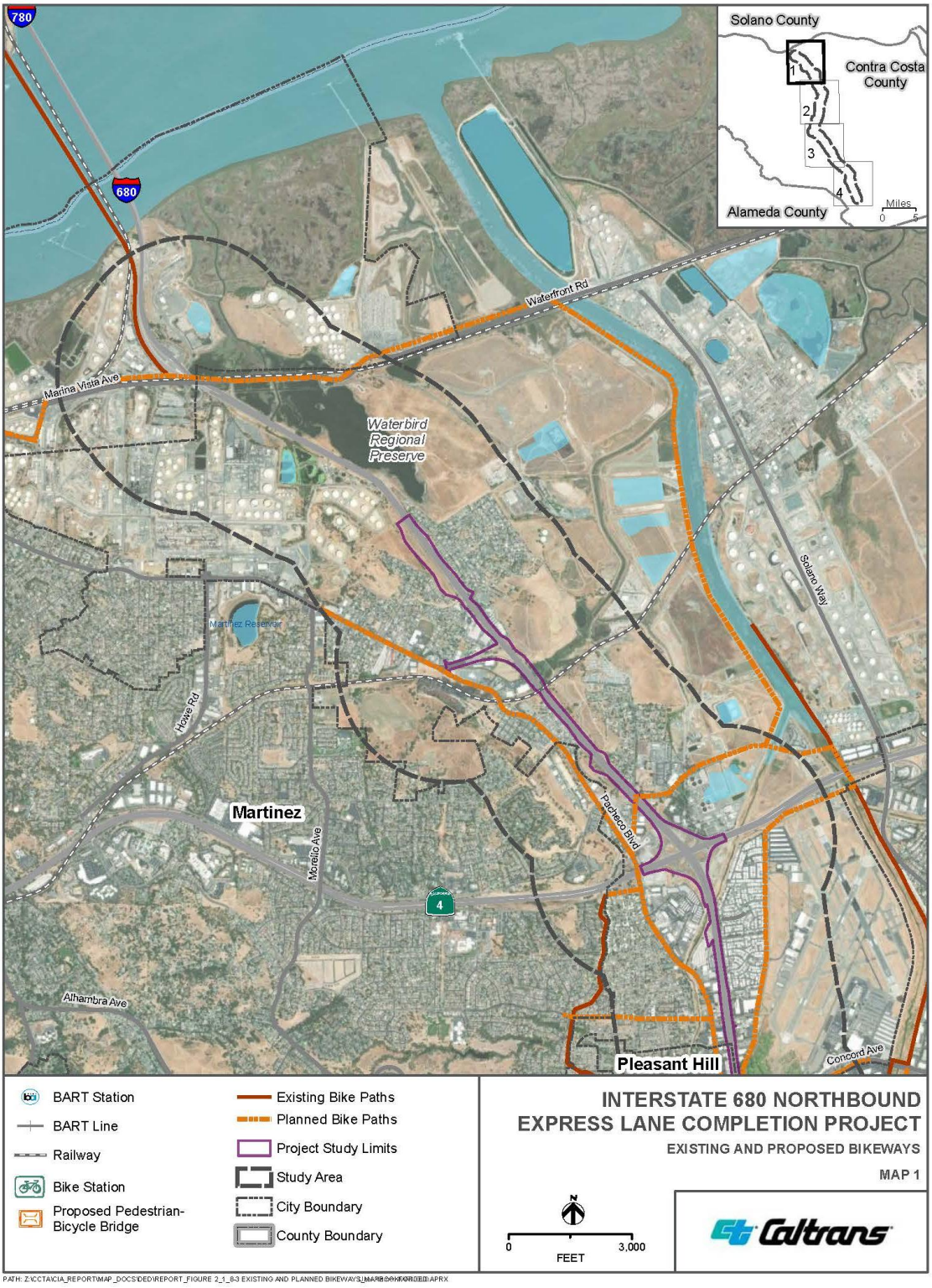


Figure 2.1.8-3. Existing and Planned Bikeways within Community Impact Study Area (Map 1 of 4)

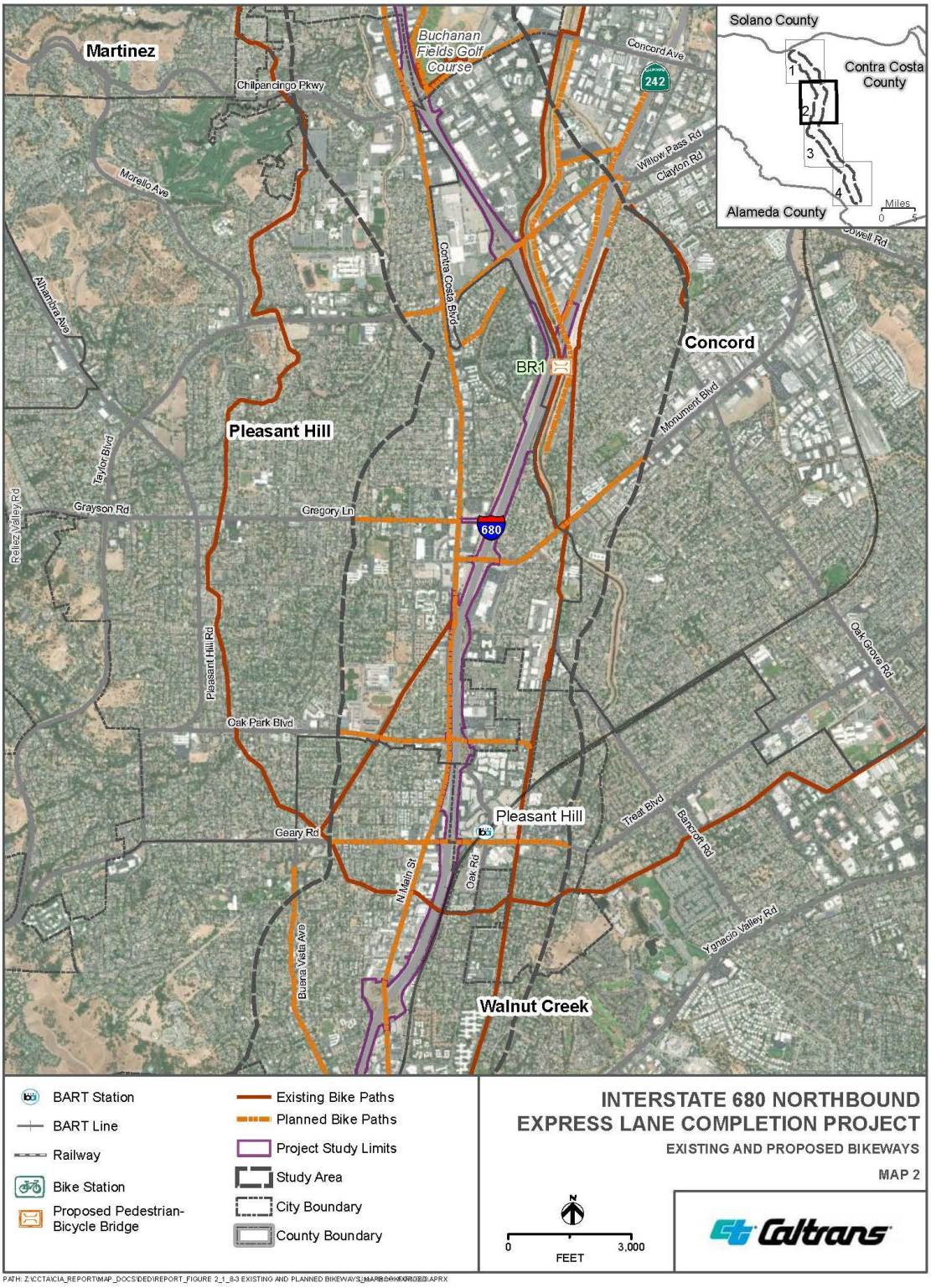


Figure 2.1.8-3. Existing and Planned Bikeways within Community Impact Study Area (Map 2 of 4)

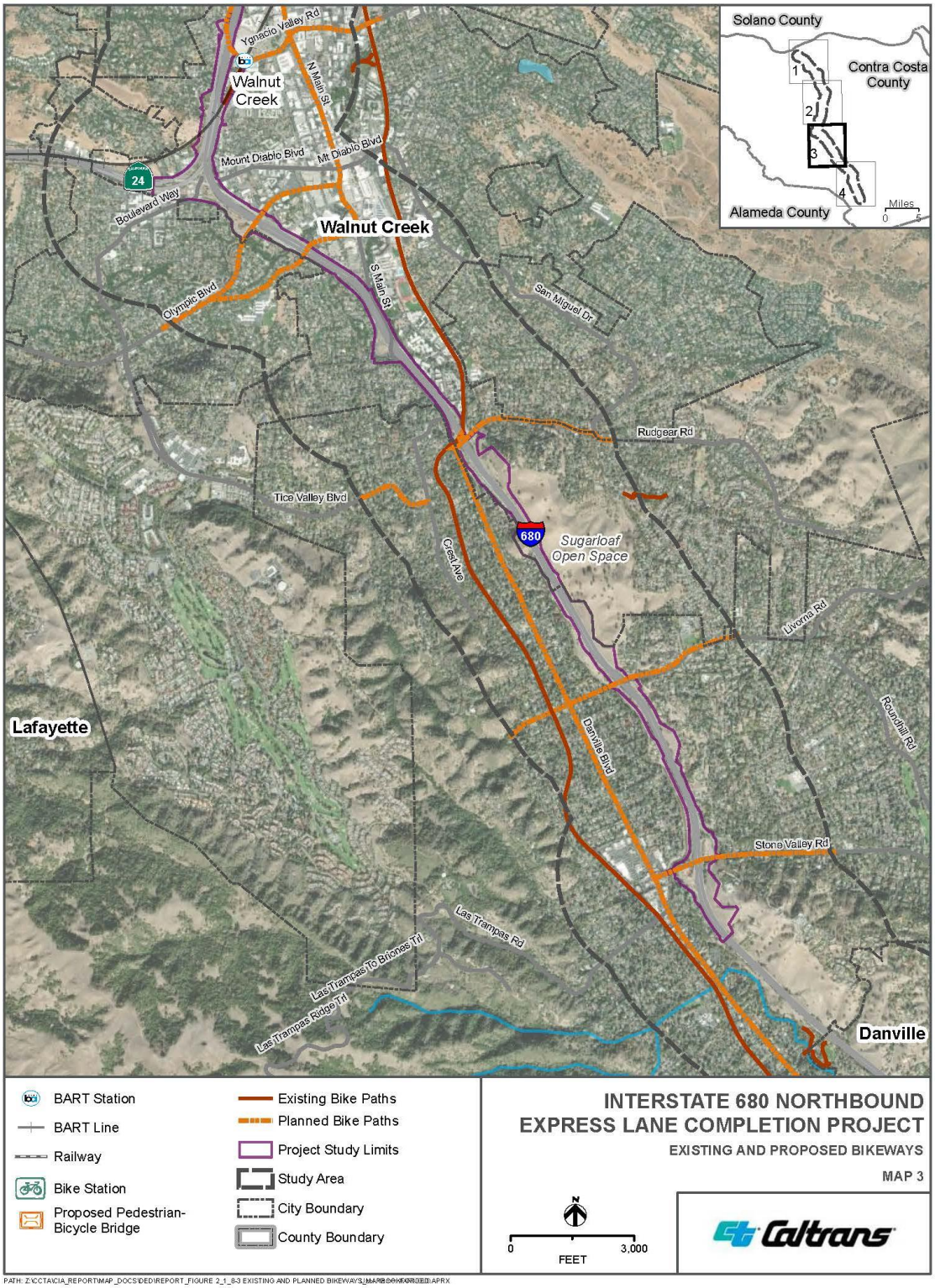


Figure 2.1.8-3. Existing and Planned Bikeways within Community Impact Study Area (Map 3 of 4)

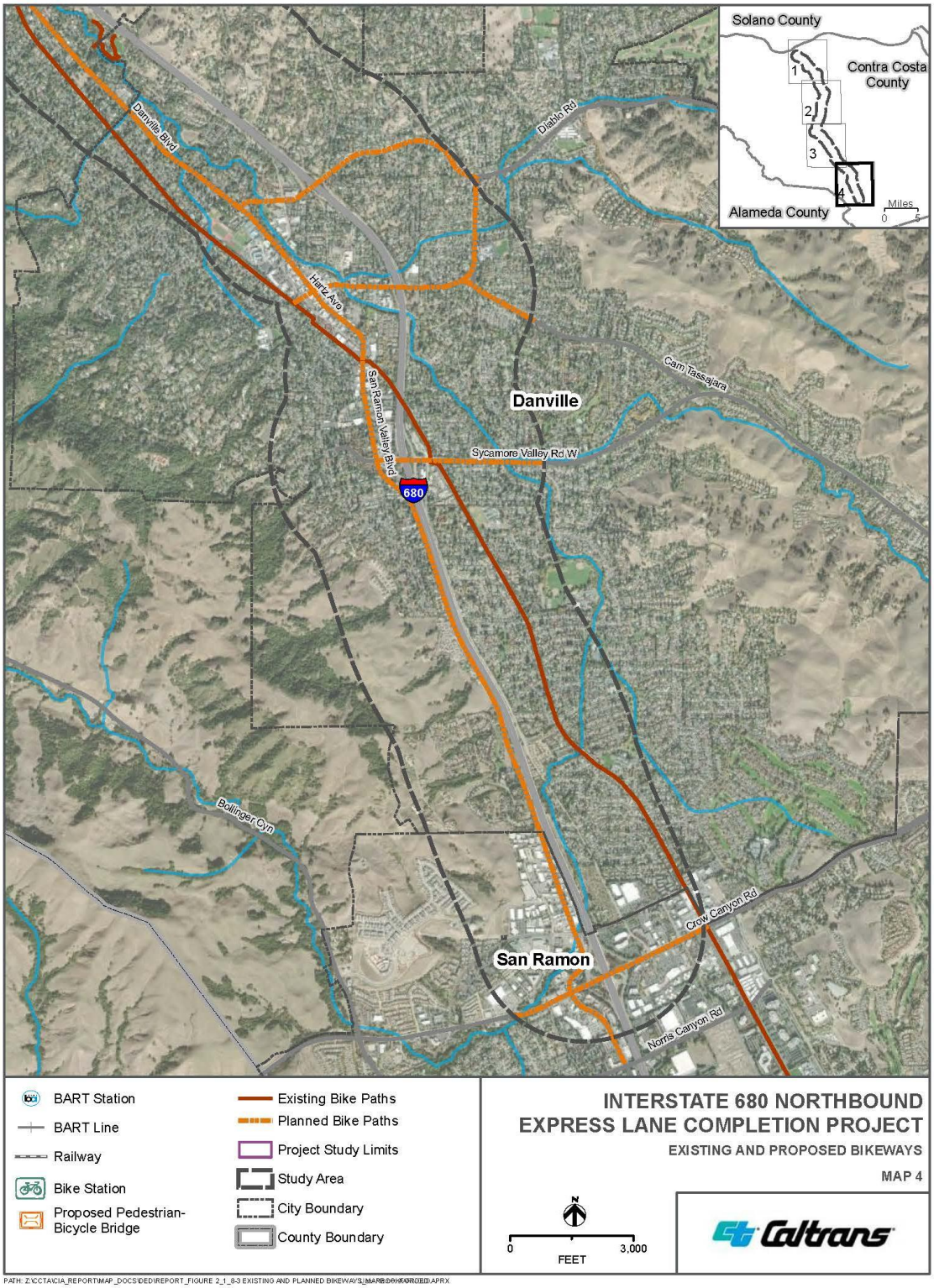


Figure 2.1.8-3. Existing and Planned Bikeways within Community Impact Study Area (Map 4 of 4)

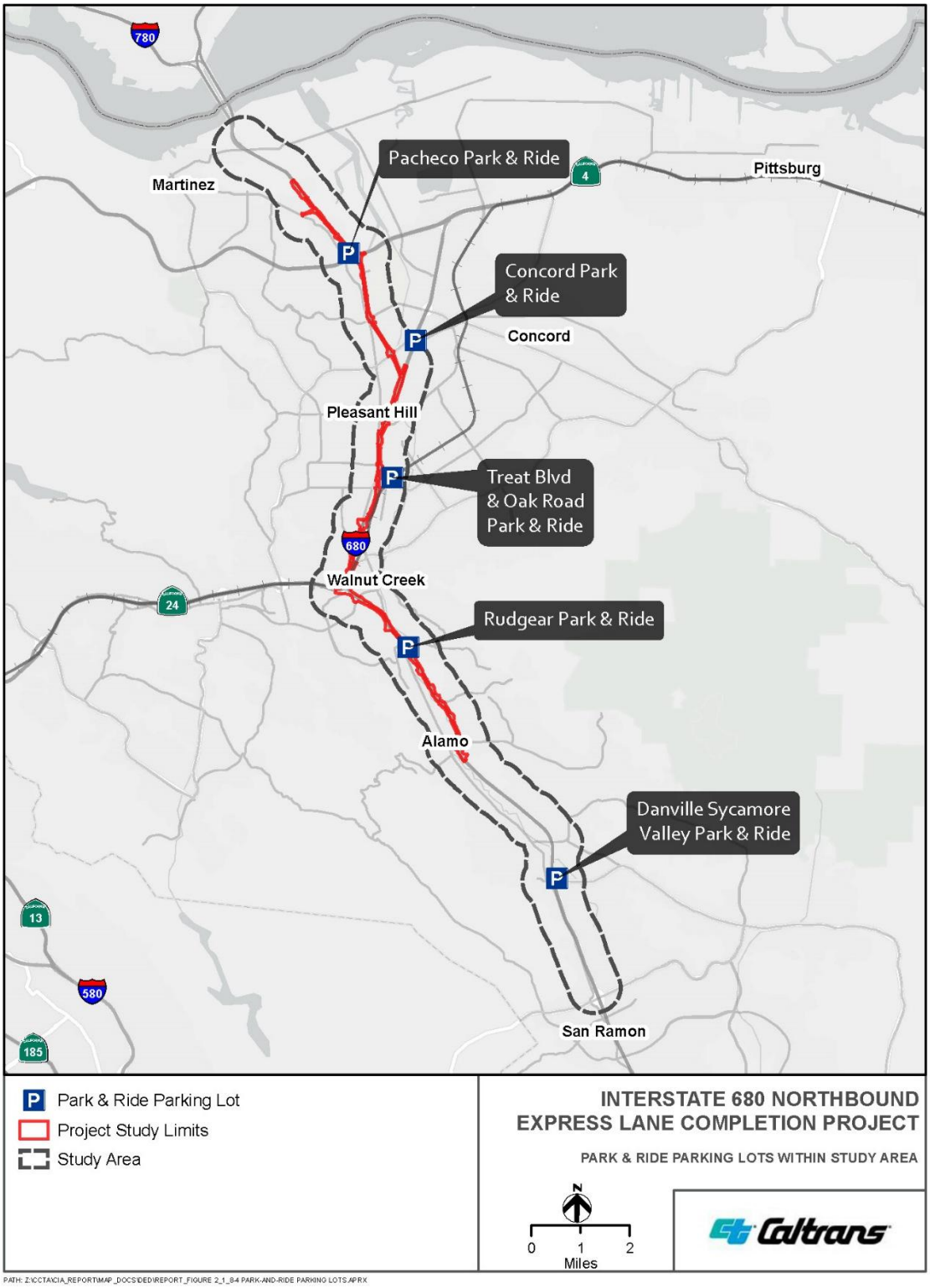


Figure 2.1.8-4. Park-and-Ride Parking Lots within Community Impact Study Area

Transit

Contra Costa County is served by bus and rail transit systems. The BART commuter rail system has one line operating through the Study Area. The Antioch line provides service to San Francisco, Oakland, and the San Francisco International Airport, with Walnut Creek, Pleasant Hill/Contra Costa Center, and Concord stations located in the Study Area.

The North Concord/Martinez, Concord, Pleasant Hill/Contra Costa Center, and Walnut Creek stations are the closest BART stations to the Traffic Operations Study Area (Figure 2.1.8-2). BART runs parallel along northbound I-680 from south of the Treat Boulevard off-ramp to the SR-24 Interchange, where it crosses over northbound and southbound I-680. The Walnut Creek BART Station is adjacent to the Project Study Limits near the SR-24 Interchange.

Public transit routes and privately operated shuttles use portions of the I-680 corridor within the improvement limits. The traffic operations modeling includes the following five existing transit routes and one planned transit route (Kittelson & Associates and DKS Associates, 2022):

- County Connection 92X – ACE Express
- County Connection 95X – San Ramon/BART Walnut Creek
- County Connection 96X – BART Walnut Creek/Bishop Ranch
- County Connection 98X – Martinez/BART Walnut Creek
- Solano County Transit (SolTrans) Yellow Line – Vallejo/ BART Walnut Creek
- (Planned) County Connection 680X – Dublin/Martinez Amtrak

For a complete list of transit services included in the traffic analysis modeling, please see the TOAR (DKS Associates, 2023a), specifically the Contra Costa Travel Model Traffic Validation Report (Appendix B of the TOAR).

Bus operators from outside of Contra Costa County, including Livermore-Amador Valley Transit Authority (Wheels), Fairfield and Suisun Transit (FAST), Solano Express, and SolTrans, provide intercounty service to BART stations in Contra Costa County. From the tri-valley area in Alameda County, Wheels provides express service on Route 70X between East Dublin/Pleasanton BART Station and Pleasant Hill BART Station with scheduled stops at the Walnut Creek BART Station. Bus service from Solano County feeds into the Pleasant Hill BART Station, with the Solano Express Yellow Line operating between the Walnut Creek BART Station and Vallejo Transit Center and the FAST Blue Line operating between the Walnut Creek BART Station and Sacramento (with scheduled stops in Benicia, Fairfield, and Vacaville).

The Martinez Amtrak Station is an intermodal station located in the city of Martinez, west of the I-680/Waterfront Road/Marina Vista Avenue crossing (Figure 2.1.8-2). Amtrak San Joaquin provides connection from Oakland to Bakersfield through the Amtrak Station. Capitol Corridors, which connect San Jose Diridon to Auburn Conheim, also operates through the Martinez Amtrak Station. The train station serves several bus services, including Amtrak Thruway, County Connection, and Capitol Corridors. Western Contra Costa Transit Authority's bus service, WestCAT 30Z, operates Monday through Friday connecting the Martinez Amtrak Station to the Hercules Transit Center. Meanwhile, Coast Starlight and California Zephyr also operate out of the Martinez Amtrak Station.

2.1.8.3 Environmental Consequences

No-Build Alternative

The No-Build Alternative would maintain the current configurations of I-680 in the Transportation Operations Study Area. Under the No-Build Alternative, the proposed Project would not be constructed, and no impacts to traffic and transportation would occur. As described below, the gap in the northbound managed lane would remain and, as traffic demand increases, traffic operations along northbound I-680 would further deteriorate, resulting in increased congestion, vehicle delay, and vehicle emissions due to slower operating speeds on I-680 by Design Year (2047).

Table 2.1.8-13 summarizes the forecasted increase in traffic volume (i.e., traffic growth) from Existing Year (2019) conditions to the Opening Year (2027) and Design Year (2047) conditions for the No-Build Alternative. Traffic growth is expected to increase the congestion and delay associated with the existing corridor bottlenecks, with the highest levels of traffic demand and congestion in the northbound direction occurring during the evening peak period. Appendix K, Level of Service and Delay, presents the LOS and density by segment for the No-Build Alternative during morning and afternoon peak periods. The bottleneck sections and subsequent queuing are described further in Table 2.1.8-14 and Table 2.1.8-15 for the Opening Year (2027) and Design Year (2047), respectively. Bottleneck sections operate at LOS E, with segments with subsequent queuing operating at LOS F (i.e., demand exceeds capacity). LOS along the corridor within the improvement limits are forecasted to deteriorate over time in both the morning and afternoon peak periods compared to existing conditions. VMT is also forecasted to increase along the corridor over time.

Table 2.1.8-13. No-Build Alternative Traffic Forecasts for Northbound I-680

Northbound I-680 Segment	EXISTING YEAR (2019)	OPENING YEAR (2027)		DESIGN YEAR (2047)	
	Traffic Count	Volume	Growth from 2019	Volume	Growth from 2019
Morning Peak Period					
Alameda County Line	21,400	24,200	13%	28,700	34%
North of Alcosta Boulevard	22,000	24,700	12%	29,000	32%
North of Crow Canyon	19,800	23,200	17%	25,300	28%
North of El Pintado Road	22,700	25,700	13%	28,400	25%
North of Livorna Road	24,600	27,500	12%	30,100	22%
South of off-ramp to SR-24	23,300	25,900	11%	27,600	18%
South of on-ramp from SR-24	14,900	17,300	16%	19,200	29%
South of on-ramp from Lawrence Way	24,100	27,200	13%	30,600	27%
South of Monument Boulevard	25,400	28,200	11%	31,300	23%
South of Willow Pass Road	15,600	18,400	18%	20,500	31%
South of SR-4	14,900	17,400	17%	19,800	33%
South of Waterfront Road/Marina Vista Avenue	12,500	15,500	24%	17,700	42%
North of Waterfront Road/Marina Vista Avenue	11,300	14,400	27%	16,700	48%
Afternoon Peak Period					
Alameda County Line	24,300	24,800	2%	29,700	22%
North of Alcosta Boulevard	22,000	22,500	2%	26,700	21%
North of Crow Canyon Road	23,300	24,900	7%	27,000	16%
North of El Pintado Road	22,700	24,400	7%	26,800	18%
North of Livorna Road	23,200	24,300	5%	26,000	12%

Northbound I-680 Segment	EXISTING YEAR (2019)	OPENING YEAR (2027)		DESIGN YEAR (2047)	
	Traffic Count	Volume	Growth from 2019	Volume	Growth from 2019
South of off-ramp to SR-24	17,200	18,100	5%	18,800	9%
South of on-ramp from SR-24	14,900	15,500	4%	17,000	14%
South of on-ramp from Lawrence Way	28,100	28,600	2%	29,200	4%
South of Monument Boulevard	35,800	36,900	3%	39,600	11%
South of Willow Pass Road	19,100	20,500	7%	23,100	21%
South of SR-4	22,200	24,200	9%	28,400	28%
South of Waterfront Road/Marina Vista Avenue	18,700	20,600	10%	23,700	27%
North of Waterfront Road/Marina Vista Avenue	19,500	21,800	12%	26,500	36%

Source: (DKS Associates, 2023a)
Note: SR = State Route

Table 2.1.8-14. No-Build Alternative Key Bottlenecks Along Northbound I-680 for the Opening Year (2027)

Bottleneck Location	Description
Morning Peak Period	
El Pintado Road on-ramp	This bottleneck forms at 7:30 a.m. and extends beyond the study period ending at 9:00 a.m. Queues from this bottleneck extend south as far as the Crow Canyon Road Interchange (approximately 4.6 miles) by 8:00 a.m. and are sustained through the end of the study period. This bottleneck is outside the improvement limits and is expected to develop and constrain traffic volumes reaching downstream freeway segments under all Build Alternatives. Therefore, the El Pintado bottleneck impacts system-wide performance measures substantially for all alternatives.
Afternoon Peak Period	
El Pintado Road on-ramp	This bottleneck forms at approximately 2:45 p.m. and is sustained until approximately 6:30 p.m. Queues from this bottleneck extend south as far as the Crow Canyon Road interchange (approximately 4.6 miles) between 4:15 p.m. and 5:45 p.m. before beginning to recede. This bottleneck is outside the improvement limits and is expected to occur and constrain traffic volumes reaching downstream freeway segments under all Build Alternatives. Therefore, this bottleneck has a substantial impact on all system-wide performance measures.
Lawrence Way on-ramp to Treat Boulevard off-ramp	This bottleneck develops due to high mainline and ramp volumes and a reduced mainline capacity associated with the weaving movements between the Lawrence Way on-ramp and the Treat Boulevard off-ramp. Vehicles entering from SR-24 and exiting at the Treat Boulevard off-ramp further exacerbate the issue by having to weave across multiple lanes. The bottleneck develops and controls operations beginning at approximately 2:45 p.m., when traffic demand has exceeded the capacity of the bottleneck section, and queues begin developing upstream of it. By 4:15 p.m., queues from the downstream bottleneck at Oak Road extend through this section, and it becomes hidden until approximately 6:30 p.m. As queues recede from the Oak Road bottleneck, this again becomes a controlling bottleneck by 6:45 p.m. before approaching queues dissipate around 7:45 p.m.
Oak Road on-ramp to Contra Costa Boulevard off-ramp	The bottleneck forms due to a combination of high mainline volume and reduced mainline capacity due to weaving movement between the Oak Road on-ramp and Contra Costa Boulevard off-ramp. The lane imbalance in this section, with vehicles merging into the right lane positioning to exit at SR-242, contributes to the bottleneck. The bottleneck develops around 2:45 p.m. and continues until around 7:15 p.m. Maximum queues spill back approximately 4.7 miles through upstream bottlenecks to the Rudgear Road off-ramp between 6:00 p.m. and 6:30 p.m.

Bottleneck Location	Description
SR-242 off-ramp	Congestion on northbound SR-242 spills back onto northbound I-680 and reduces the capacity on the segment of northbound I-680 approaching the SR-242 off-ramp. The reduced capacity in this area results in a bottleneck developing around 4:00 p.m. with relatively short maximum queues extending about 1.3 miles to the area of the Monument Boulevard and Contra Costa Boulevard Interchanges. Congestion persists in this area until traffic demands have reduced enough for the queues to run-off around 6:30 p.m., with associated congestion extending through the other upstream bottlenecks briefly (15 minutes) at the height of the afternoon peak period. Approaching the SR-242 off-ramp, the congestion is contained mainly in the four outside lanes on northbound I-680, with the two inside lanes operating at near free-flow speeds.
SR-24	The queues from the Lawrence Way on-ramp/Treat Boulevard off-ramp and Oak Road bottlenecks extend onto eastbound SR-24 during a substantial portion of the peak period and result in congested conditions on the Interchange starting at 3:30 p.m. The queue extends past the model limits (Upper Happy Valley Road) by approximately 6:00 p.m. and dissipates around 7:30 PM.

Source: (DKS Associates, 2023a)
Note: SR = State Route

Table 2.1.8-15. No-Build Alternative Key Bottlenecks Along Northbound I-680 for the Design Year (2047)

Bottleneck Location	Description
Morning Peak Period	
Alcosta Boulevard on-ramp to Bollinger Canyon Road off-ramp	Traffic growth between Opening Year (2027) and Design Year (2047) is expected to result in a new bottleneck developing north of the Alcosta Boulevard on-ramp at around 7:30 a.m. and extending through the analysis period. Queues from this bottleneck extend beyond the Traffic Operations Study Area by 8:00 a.m. This bottleneck is outside the improvement limits and is expected to constrain traffic volumes reaching downstream freeway segments under all Build Alternatives and, therefore, has a substantial impact on all system-wide performance measures.
El Pintado Road on-ramp	This bottleneck forms shortly after the start of the analysis period (7:00 a.m.) at around 7:15 a.m. and continues to develop beyond the end of the study period (9:00 a.m.). Queues from this bottleneck extend as far south as the Bollinger Canyon Interchange (approximately 6 miles) by 9:00 a.m. Similar to the Alcosta Boulevard bottleneck, this bottleneck is outside the improvement limits and is expected constrain traffic volumes reaching downstream freeway segments under all the Build Alternatives and, therefore, has a substantial impact on all system-wide performance measures.

Bottleneck Location	Description
Livorna Road on-ramp to the End of Northbound Express Lane	This minor bottleneck develops for a short duration between 8:00 a.m. and 8:30 a.m. due to high traffic demand, imbalanced lane utilization, and weaving maneuvers at the end of the express lane near the Livorna Road on-ramp. The short queues approaching this bottleneck are limited to the Livorna Road Interchange area.
Afternoon Peak Period	
El Pintado Road on-ramp	This bottleneck forms shortly after the start of the analysis period (2:00 p.m.) at around 2:15 p.m. and is sustained until approximately 7:00 p.m. Queues from this bottleneck extend beyond the Traffic Operations Study Area, south of the Alcosta Interchange (approximately 9 miles), between 4:30 p.m. and 6:30 p.m. before beginning to recede. This bottleneck is outside the improvement limits and is expected constrain traffic volumes reaching downstream freeway segments under all the Build Alternatives and, therefore, has a substantial impact on all system-wide performance measures.
Lawrence Way on-ramp to Treat Boulevard off-ramp	Similar to Opening Year (2027) conditions, this bottleneck develops due to high mainline and ramp volumes and a reduced mainline capacity associated with weaving movements between the Lawrence Way on-ramp and the Treat Boulevard off-ramp. Vehicles entering from SR-24 and exiting at the Treat Boulevard off-ramp further exacerbate the issue by having to weave across multiple lanes. The bottleneck develops and controls operations beginning around 2:30 p.m., when traffic demand has exceeded the capacity of the bottleneck section, and queues begin developing upstream. By approximately 4:15 p.m., queues from the downstream bottleneck north of Oak Road extend through this section, and it becomes hidden until about 6:45 p.m. when queues recede north toward the Oak Road bottleneck. This again becomes a controlling bottleneck by approximately 6:45 p.m. and is sustained beyond the analysis period (8:00 p.m.). When this bottleneck is controlling, the maximum queues associated with it extend as far south as the Stone Valley on-ramp between 3:30 p.m. and 3:45 p.m., a distance of approximately 5.5 miles.
Oak Road on-ramp to Contra Costa Boulevard off-ramp	The bottleneck is formed due to a combination of high mainline volume and reduced mainline capacity due to weaving movements between Oak Road on-ramp and Contra Costa off-ramp. The lane imbalance in this section, with vehicles merging into the right lane positioning to exit at SR-242, contributes to the bottleneck. This freeway section develops as a controlling bottleneck around 2:30 p.m. and continues until around 7:15 p.m. Maximum queues approaching the bottleneck extend approximately 5.8 miles through the Lawrence Way on-ramp to Treat Boulevard off-ramp bottleneck to the Livorna Road on-ramp between 5:15 p.m. and 5:30 p.m. and again between 6:00 p.m. and 6:15 p.m.

Bottleneck Location	Description
SR-242 off-ramp	Congestion on northbound SR-242 spills back onto northbound I-680 and reduces the capacity of northbound I-680 approaching the SR-242 off-ramp. The reduced capacity in this area results in a bottleneck developing around 4:00 p.m. with relatively short maximum queues extending approximately 1.3 miles to the Monument Boulevard and Contra Costa Boulevard Interchanges. Congestion persists in this area until traffic demands have reduced enough for the queues to run-off around 6:30 p.m., with associated congestion extending through the other upstream bottlenecks intermittently for a 15- to 30-minute duration at the height of the afternoon peak period. Approaching the SR-242 off-ramp, the congestion is contained mainly in the four outside lanes on I-680, with the two inside lanes operating at near free-flow speeds.
SR-24	The queues from the Lawrence Way on-ramp/Treat Boulevard off-ramp and Oak Road bottlenecks extend onto eastbound SR-24 during a substantial portion of the peak period and result in congested conditions on SR-24 starting at 3:30 PM. The queue extends past the model limits (Upper Happy Valley Road) by 6 PM and dissipates around 7:00 PM. Another bottleneck develops on SR-24, between the First Street on-ramp and Pleasant Hill Road off-ramp, at 2:45 PM and lasts until 3:30 PM, prior to queues from the Lawrence Way on-ramp/Treat Boulevard off-ramp extending through it. The bottleneck results from high on- and off-ramp volumes and reduced mainline capacity due to weaving movements between First Street on-ramp and SR-24 traffic exiting to Pleasant Hill Road and southbound I-680. As the queues from the upstream bottleneck spill back into this segment, the bottleneck is hidden until 7:00 PM. The bottleneck is controlling again by 7:15 PM and lasts beyond the analysis period. The queue from this bottleneck extends beyond the Traffic Operations Study Area.

Source: (DKS Associates, 2023a)
Note: SR = State Route

Build Alternatives (Alternatives 1C, 2, 3, and 5)

Temporary (Construction) Impacts

Construction would involve converting or adding an express lane adjacent to the median on I-680 from Livorna Road to the Arthur Road on-Ramp. The additional lane would require reconstruction and paving along the median adjacent to the existing freeway lanes, as well as some widening of pavement on the inside or outside of the existing freeway to create the necessary pavement width to accommodate the proposed express lanes. Construction would also involve installation of signs, tolling equipment, utility connections, and other equipment and facilities along the freeway. These installations would require short-term, temporary, periodic lane and shoulder closures on I-680 within the Project Study Limits. When possible, work would be performed at night to avoid peak travel periods to minimize traffic disruption.

Temporary (overnight) lane and ramp closures on I-680 and local roads would be required for all Build Alternatives. Alternatives 1C and 3 would require full overnight closures of northbound I-680 for approximately 4 days, and Alternative 2 would require full overnight closures of northbound I-680 for approximately 2 days. Alternative 5 would not require full closures of northbound I-680. These overnight closures are anticipated to include closing northbound I-680 from the South Main Street off-ramp to westbound SR-24 and from Monument Boulevard to the Galindo Street on-ramp, as well as closing the eastbound SR-24 Interchange to southbound I-680. Alternatives 1C and 3 are anticipated to require closing the southbound Olympic Boulevard off-ramp for approximately 11 months. Meanwhile, Alternatives 2, 3, and 5 would close the northbound North Main Street off-ramp for approximately 1 month. As described in Section 2.1.3, *Parks and Recreational Facilities*, and Appendix A, Alternatives 1C, 2, and 3 would temporarily close a segment of the Iron Horse Regional Trail and Alternatives 2, 3, and 5 would temporarily close a segment of the Contra Costa Canal Trail/Briones to Mount Diablo Regional Trail during construction. As discussed in Section 2.1.3, *Parks and Recreational Facilities*, trail access would be maintained throughout construction.

Therefore, temporary impacts on circulation and access would result from construction activities, including mainline lane closures and ramp connector closures. To reduce disruptions and limit impacts on the community, Measure **TRAN-1** would be implemented, requiring that no two consecutive off-ramps or two consecutive on-ramps in the same direction would be closed concurrently during construction. As described in Section 1.4.1.6, *Standardized Project Measures*, a Transportation Management Plan (TMP) would be prepared during final design to further define freeway, lane, trail, and ramp closures. The TMP would develop detours and use public outreach to inform local agencies and the public of the times and locations when construction and closures would occur. Bicycling advocacy groups would be included in planning any necessary bike or pedestrian detours. Access to residences and businesses in the immediate vicinity of the proposed Project would be maintained during construction. Traffic disruption during construction is therefore not anticipated to have substantial temporary adverse direct or indirect impacts on traffic and transportation.

Permanent Impacts

Traffic Demand

Alternative 1C

Alternative 1C would provide a continuous managed lane on northbound I-680 from the Alameda County line to north of Arthur Road. Traffic demand under Alternative 1C are forecasted to be higher than the No-Build Alternative along the corridor, with the largest percent increases between Livorna Road and Willow Pass Road, through the SR-24 Interchange, in the afternoon peak period. The higher traffic demand is attributed largely to the added express lane in the northbound direction. There would also be a slight increase in traffic demand due to the conversion of the HOV lane south of the Benicia-Martinez Bridge Toll Plaza to an express lane.

Alternative 2 (Preferred Alternative)

Alternative 2 has been selected as the preferred alternative. Alternative 2 would reduce the gap in managed lanes but would not provide a continuous managed lane on northbound I-680. Overall, traffic demand for Alternative 2 is forecasted to increase compared to the No-Build Alternative due to the increase in freeway capacity. Despite the proposed gap in managed lanes at the SR-24 Interchange, there is anticipated to be a slight increase in volume around the SR-24 Interchange. In addition, the vehicle throughput for Alternative 2 would be less than that of the No-Build Alternative due to the proposed braided ramps.

Alternative 3

Alternative 3 combines the proposed improvements for Alternatives 1C and 2. As with Alternative 1C, Alternative 3 would close the gap in managed lanes on northbound I-680 by adding a through lane along northbound I-680. Traffic demand for Alternative 3 is forecasted to increase compared to the No-Build Alternative due to the increase in freeway capacity. Although Alternative 3 would include braided ramps, the higher capacity from the added express lane south of SR-24 would result in higher vehicle throughput.

Alternative 5

Alternative 5 would reduce the gap in managed lanes with lane conversions between Livorna Road and Arthur Road but would not provide a continuous managed lane along northbound I-680 or add a new through lane on I-680. Like Alternative 2, Alternative 5 would include a gap in managed lanes at the SR-24 Interchange. Based on a review of the forecasts for Alternative 5, it was noted that the CCTA Travel Demand Model does not recognize existing operational bottlenecks accurately enough to generate demand forecasts for alternatives where the existing lane is converted to a managed lane with lower capacity. Therefore, a more conservative approach of using No-Build Alternative demand inputs for the conversion alternatives was adopted for Alternative 5. As depicted in Table 2.1.8-16 and Table 2.1.8-17, Alternative 5 traffic demand would be largely similar to or slightly higher than the No-Build Alternative. However, unlike Alternatives 1C, 2, and 3, there are multiple locations where traffic demand would be less than that of the No-Build Alternative.

Table 2.1.8-16. Forecasted Traffic Volumes Opening Year (2027)

Northbound I-680 Segments	No-Build	Alt 1C	Alt 2 *	Alt 3	Alt 5
Morning Peak Hours					
Alameda County Line	24,200	24,500	24,400	24,500	24,400
North of Alcosta Boulevard	24,700	25,000	24,900	25,000	24,800

Northbound I-680 Segments	No-Build	Alt 1C	Alt 2 *	Alt 3	Alt 5
North of Crow Canyon Road	23,200	23,600	23,500	23,600	23,400
North of El Pintado Road	25,700	26,600	26,600	26,600	26,300
North of Livorna Road	27,500	29,300	29,400	30,500	28,200
South of off-ramp to SR-24	25,900	27,300	26,500	27,200	26,100
South of on-ramp from SR-24	17,300	19,100	17,700	18,300	17,700
South of off-ramp to Penniman Way/North Main Street	28,500	30,600	29,000	29,600	28,800
South of Monument Boulevard	28,200	29,900	29,200	30,200	28,500
South of Willow Pass Road	18,400	19,800	19,200	19,900	18,600
South of SR-4	17,400	18,100	18,300	18,300	17,800
South of Waterfront Road/Marina Vista Avenue	15,500	15,900	15,900	15,900	15,600
North of Waterfront Road/Marina Vista Avenue	14,400	14,700	14,700	14,800	14,600
Afternoon Peak Hours					
Alameda County Line	24,800	25,200	25,100	25,200	24,900
North of Alcosta Boulevard	22,500	22,900	22,900	23,000	22,600
North of Crow Canyon Road	24,900	25,200	25,100	25,200	25,000
North of El Pintado Road	24,400	25,300	25,100	25,300	24,600
North of Livorna Road	24,300	26,200	25,900	26,100	24,200
South of off-ramp to SR-24	18,100	20,400	18,700	20,400	18,100
South of on-ramp from SR-24	15,500	18,300	16,700	18,800	15,800
South of off-ramp to Penniman Way/North Main Street	29,700	33,100	31,400	33,700	29,700
South of Monument Boulevard	37,000	40,800	40,500	40,700	36,100
South of Willow Pass Road	20,600	24,100	23,800	23,900	20,100
South of SR-4	24,300	26,300	26,100	26,100	24,500

Northbound I-680 Segments	No-Build	Alt 1C	Alt 2 *	Alt 3	Alt 5
South of Waterfront Road/Marina Vista Avenue	20,700	21,400	21,300	21,400	20,300
North of Waterfront Road/Marina Vista Avenue	21,800	22,400	22,300	22,300	21,800

Source: (DKS Associates, 2023a)
* Alternative 2 is the preferred alternative.

Table 2.1.8-17. Forecasted Traffic Volumes Design Year (2047)

Northbound I-680 Segments	No-Build	Alt 1C	Alt 2 *	Alt 3	Alt 5
Morning Peak Hours					
Alameda County Line	28,700	29,300	29,200	29,300	28,900
North of Alcosta Boulevard	29,000	29,500	29,500	29,600	29,300
North of Crow Canyon Road	25,300	25,800	25,800	25,800	25,600
North of El Pintado Road	28,400	29,100	29,100	29,100	28,600
North of Livorna Road	30,100	32,000	31,900	32,100	30,200
South of off-ramp to SR-24	27,600	29,000	28,500	29,000	27,800
South of on-ramp from SR-24	19,200	20,800	19,200	20,800	18,900
South of off-ramp to Penniman Way/North Main Street	32,000	34,300	32,400	34,200	31,800
South of Monument Boulevard	31,300	33,000	33,400	33,400	31,700
South of Willow Pass Road	20,500	22,200	22,300	22,300	20,800
South of SR-4	19,800	21,200	21,200	21,300	20,500
South of Waterfront Road/Marina Vista Avenue	17,700	18,500	18,500	18,500	17,800
North of Waterfront Road/Marina Vista Avenue	16,700	17,300	17,300	17,400	16,900
Afternoon Peak Hours					
Alameda County Line	29,700	30,000	29,900	30,000	29,700

Northbound I-680 Segments	No-Build	Alt 1C	Alt 2 *	Alt 3	Alt 5
North of Alcosta Boulevard	26,700	26,800	26,800	26,800	26,700
North of Crow Canyon Road	27,000	27,600	27,500	27,500	27,100
North of El Pintado	26,800	27,700	27,600	27,700	27,100
North of Livorna Road	26,000	28,800	28,600	28,900	25,700
South of off-ramp to SR-24	18,800	22,600	20,400	22,600	18,500
South of on-ramp from SR-24	17,000	20,600	19,500	20,800	16,900
South of off-ramp to Penniman Way/North Main Street	31,200	35,500	34,200	35,800	30,900
South of Monument Boulevard	39,600	43,500	43,300	43,600	38,000
South of Willow Pass Road	23,100	26,400	26,500	26,500	22,000
South of SR-4	28,400	29,300	29,300	29,300	28,100
South of Waterfront Road/Marina Vista Avenue	23,700	24,000	23,900	24,000	23,200
North of Waterfront Road/Marina Vista Avenue	26,500	26,900	26,800	26,900	26,200

Source: (DKS Associates, 2023a)
Note: SR = State Route
* Alternative 2 is the preferred alternative.

Corridor-Level Travel Time

Table 2.1.8-18 provides the average and maximum corridor-level travel time for general-purpose and managed lane users during the morning and afternoon peak hours for the Opening Year (2027) and Design Year (2047). Travel time savings is defined as the difference in travel time between the proposed managed lane and general-purpose lanes. Free flow travel time for the corridor was defined as 12 minutes based on 65 mph. As described below, all Build Alternatives would improve travel time substantially during the afternoon peak period compared to the No-Build Alternative. Alternatives 1C, 2, and 3 would have similar corridor travel times as the No-Build Alternative for the morning peak period. Meanwhile, Alternative 5 would increase travel time for the morning peak period compared to the No-Build Alternative.

Table 2.1.8-18. Travel Time for Opening Year (2027) and Design Year (2047)

Total Corridor	No-Build	Alt 1C	Alt 2 *	Alt 3	Alt 5
	Minutes				
Opening Year (2027) Morning Peak Hours					
I-680 General-Purpose User Total (Average)	13.0	12.8	12.8	12.9	14.2
I-680 Managed Lane User Total (Average)	13.0	12.6	12.4	12.7	13.2
Managed Lane Travel Time Savings (Average)	0.0	0.2	0.4	0.2	1.0
I-680 General-Purpose User Total (Maximum)	13.1	12.9	12.9	12.9	15.1
I-680 Managed Lane User Total (Maximum)	13.1	12.6	12.5	12.7	13.8
Managed Lane Travel Time Savings (Maximum)	0.0	0.3	0.4	0.2	1.3
Opening Year (2027) Afternoon Peak Hours					
I-680 General-Purpose User Total (Average)	19.0	15.5	14.4	16.4	17.9
I-680 Managed Lane User Total (Average)	19.0	12.7	12.7	12.7	15.6
Managed Lane Travel Time Savings (Average)	0.0	2.8	1.8	3.7	2.4
I-680 General-Purpose User Total (Maximum)	25.5	18.3	15.8	19.6	24.1
I-680 Managed Lane User Total (Maximum)	25.5	12.9	12.9	12.9	20.0
Managed Lane Travel Time Savings (Maximum)	0.0	5.4	2.9	6.8	4.1
Design Year (2047) Morning Peak Hours					
I-680 General-Purpose User Total (Average)	13.2	13.0	13.1	13.2	18.3
I-680 Managed Lane User Total (Average)	13.2	12.7	12.5	12.9	16.2
Managed Lane Travel Time Savings (Average)	0.1	0.3	0.6	0.3	2.1
I-680 General-Purpose User Total (Maximum)	13.3	13.0	13.1	13.2	22.7
I-680 Managed Lane User Total (Maximum)	13.2	12.7	10.8	12.9	19.3
Managed Lane Travel Time Savings (Maximum)	0.1	0.3	2.3	0.3	3.4
Design Year (2047) Afternoon Peak Hours					

Total Corridor	No-Build	Alt 1C	Alt 2 *	Alt 3	Alt 5
	Minutes				
I-680 General-Purpose User Total (Average)	22.3	16.5	16.4	19.1	19.1
I-680 Managed Lane User Total (Average)	22.3	12.9	14.6	12.7	16.4
Managed Lane Travel Time Savings (Average)	0.0	3.6	2.0	6.4	2.6
I-680 General-Purpose User Total (Maximum)	27.7	18.7	17.8	23.0	22.4
I-680 Managed Lane User Total (Maximum)	27.7	13.0	14.3	12.3	16.3
Managed Lane Travel Time Savings (Maximum)	0.0	5.8	3.1	10.2	4.4

Source: (DKS Associates, 2023a)

Notes: Free-flow travel time, based on 65 miles per hour, is approximately 12 minutes
* Alternative 2 is the preferred alternative.

Alternative 1C

Under Alternative 1C, average and maximum travel time are forecasted to improve substantially along the corridor compared to the No-Build Alternative for the afternoon peak hours by the Design Year (2047). Alternative 1C would approach free flow travel time in the morning peak hours for all users and in the afternoon peak hours for managed lane users. Managed lane users would experience some travel time savings in the morning peak hours and larger travel time savings during the afternoon peak hours. Alternative 1C would also be expected to provide travel time benefits for transit services. However, not all transit services would be able to take full advantage of the proposed express lane. For example, transit services with connections to the Walnut Creek BART Station would need to exit the express lane in advance of the SR-24 Interchange.

Alternative 2 (Preferred Alternative)

Alternative 2 has been selected as the preferred alternative. Unlike Alternatives 1C and 3, Alternative 2 would reduce but not eliminate the gap in managed lanes. Alternative 2 would result in corridor-level travel time savings similar to Alternative 1C. Average and maximum travel time would improve along the corridor compared to the No-Build Alternative for the Design Year (2047) afternoon peak hours. However, unlike Alternatives 1C and 3, Alternative 2 would not include an express lane through the SR-24 Interchange. Managed lane users would experience some travel time savings in both the morning and afternoon peak hours.

Alternative 3

Under Alternative 3, average and maximum travel time would improve substantially along the corridor compared to the No-Build Alternative for the Design Year (2047)

afternoon peak hours. Travel time would improve slightly compared to the No-Build Alternative in the morning peak hours. As with Alternative 1C, not all transit services would be able to take full advantage of the proposed express lane, particularly those transit services with connections to the Walnut Creek BART Station.

Alternative 5

Alternative 5 would add overall travel time on the corridor compared to the No-Build Alternative for general-purpose and managed lane users in the morning peak hours. Although Alternative 5 would improve travel time in the afternoon peak hours compared to the No-Build Alternative, Alternative 5 would not perform as well as Alternatives 1C, 2, or 3 for either managed lanes or general-purpose lanes.

Level of Service

Appendix K, *Level of Service and Delay*, compares the LOS and density during peak periods by segment for the Build Alternatives and the No-Build Alternative for the Existing Year (2019), Opening Year (2027), and Design Year (2047) conditions. The highest levels of traffic demand and congestion on northbound I-680 occur during the afternoon peak period for all Build Alternatives. More information on each Build Alternative is provided below.

An additional technical study analyzed how each Build Alternative could cause potential delays and/or LOS impacts on local intersections along the corridor during the afternoon peak period for the Design Year (2047) (DKS Associates, 2023b). Volume forecasts were developed at 16 local ramp intersections along the I-680 corridor:

- I-680 Northbound Ramps and Livorna Road Two-Way Stop Control (TWSC)
- I-680 Northbound Ramps and Rudgear Road Signal
- I-680 Northbound Ramps/S. Main Street and Creekside Drive Signal
- I-680 Northbound Ramps and Olympic Boulevard Signal
- I-680 Northbound Ramp and Ygnacio Valley Road Signal
- N Main Street and Penniman Way Signal
- Lawrence Way and Penniman Way Signal
- N Main Street and San Luis Road Signal
- N Main Street and Treat Boulevard Signal
- I-680 Northbound Ramps and Treat Boulevard Signal
- Oak Road and Treat Boulevard Signal

- Oak Road and Buskirk Avenue Signal
- I-680 Northbound Ramp and Contra Costa Boulevard Signal
- I-680 Northbound Ramps and Monument Signal
- I-680 Northbound Ramps and Willow Pass Road Signal
- Burnett Avenue and Diamond Boulevard Signal

Results indicate that none of the Build Alternatives would worsen LOS at any local intersections compared to the No-Build Alternative. All 16 intersections would operate at LOS D or better under all Build Alternatives, except N. Main Street and Geary Road/Treat Boulevard and Northbound I-680 Ramp/Oakland Boulevard and Ygnacio Valley Road, which would both operate at LOS E under all Build Alternatives and No-Build Alternative.

Alternative 1C

Overall, Alternative 1C would either improve LOS or be consistent with that of the No-Build Alternative. For example, LOS would improve from Stone Valley Road Diagonal off-ramp to between the Ygnacio Valley Road off-ramp and SR-24 Eastbound on-ramp in the afternoon peak period for the Design Year (2047). However, Alternative 1C would worsen LOS compared to the No-Build Alternative, resulting in the demand to exceed capacity (i.e., LOS F) at the following locations during the Opening Year (2027):

- Crow Canyon Road Loop on-ramp to Crow Canyon Road Diagonal on-ramp (morning)
- Weave between Stone Valley Road on-ramp and Livorna Road off-ramp (morning)
- From Bollinger Canyon Road off-ramp to between Bollinger Canyon Road Diagonal on-ramp and Crow Canyon Road off-ramp (afternoon)
- Between Crow Canyon Road off-ramp and Crown Canyon Road Loop on-ramp (afternoon)

In addition, Alternative 1C would worsen LOS compared to the No-Build Alternative, resulting in the demand to exceed capacity (i.e., LOS F) at the following location during the Design Year (2047):

- From Bollinger Canyon Road off-ramp to between Bollinger Canyon Road off-ramp and Bollinger Canyon Road Loop on-ramp (morning).

According to the intersection analysis completed for the Project (DKS Associates, 2023b), Alternative 1C would not worsen LOS at any of the 16 evaluated intersections.

Alternative 1C would improve LOS compared to the No-Build conditions at the following intersections: I-680 Northbound Ramps and Livorna Road (LOS F to LOS C), North Main Street and Penniman Way (LOS B to LOS A), Oak Road and Treat Boulevard (LOS D to LOS C), and I-680 Northbound Ramps and Willow Pass Road (LOS D to LOS C). Intersection delay would increase at Lawrence Way and Penniman Way (10.2 to 11.2 minutes), I-680 Northbound Ramp and Contra Costa Boulevard (1.1 to 1.2 minutes), and Oak Road and Buskirk Avenue (37.9 to 42.5 minutes).

Alternative 2 (Preferred Alternative)

Alternative 2 has been selected as the preferred alternative. Similar to Alternative 1C, Alternative 2 would either improve LOS or be consistent with that of the No-Build Alternative. For example, LOS would improve from Stone Valley Road Diagonal off-ramp to the weave between Olympic Boulevard on-ramp and Ygnacio Valley Road off-ramp in the afternoon peak period for the Design Year (2047). However, Alternative 2 would worsen LOS compared to the No-Build Alternative, resulting in the demand to exceed capacity (i.e., LOS F) at the following locations during the Opening Year (2027):

- Crow Canyon Road Loop on-ramp to Crow Canyon Road Diagonal on-ramp (morning)
- Weave between Stone Valley Road on-ramp and Livorna Road off-ramp (morning)
- From Alcosta Boulevard on-ramp to between Bollinger Canyon Road Diagonal on-ramp and Crow Canyon Road off-ramp (afternoon)
- Between Crow Canyon Road off-ramp and Crown Canyon Road Loop on-ramp (afternoon)

In addition, Alternative 2 would worsen LOS compared to the No-Build Alternative, resulting in the demand to exceed capacity (i.e., LOS F) at the following location during the Design Year (2047):

- From between Alcosta Boulevard on-ramp and Bollinger Canyon Road off-ramp to between Bollinger Canyon Road off-ramp and Bollinger Canyon Road Loop on-ramp (morning).

According to the intersection analysis completed for the Project (DKS Associates, 2023b), Alternative 2 would not worsen LOS at any of the 16 evaluated intersections. Alternative 2 would improve LOS compared to the No-Build conditions at the following intersections: I-680 Northbound Ramps and Livorna Road (LOS F to LOS C), and North Main Street and Penniman Way (LOS B to LOS A). Intersection delay would increase at the following intersections: I-680 Northbound Ramps/S. Main Street and Creek Side Drive (13.5 to 14 minutes), I-680 Northbound Ramps and Olympic Boulevard (30.7 to 34.9 minutes), Lawrence Way and Penniman Way (10.2 to 11 minutes), Oak Road and

Buskirk Avenue (37.9 to 39.8), and I-680 Ramp and Contra Costa Boulevard (1.1 to 1.2 minutes).

Alternative 3

Similar to Alternatives 1C and 2, Alternative 3 would either improve LOS or be consistent with that of the No-Build Alternative. For example, LOS would improve from Stone Valley Road Diagonal off-ramp to between Olympic Boulevard/SR-24 Westbound off-ramp and Olympic Boulevard on-ramp in the afternoon peak period for the Design Year (2047). However, Alternative 3 would worsen LOS compared to the No-Build Alternative, resulting in the demand to exceed capacity (i.e., LOS F) at the following locations during the Opening Year (2027):

- Crow Canyon Road Loop on-ramp to Crow Canyon Road Diagonal on-ramp (morning)
- Weave between Stone Valley Road on-ramp and Livorna Road off-ramp (morning)
- From between Alcosta Boulevard on-ramp and Bollinger Canyon Road off-ramp to between Bollinger Canyon Road Diagonal on-ramp and Crow Canyon Road off-ramp (afternoon)
- Between Crow Canyon Road off-ramp and Crow Canyon Road Loop on-ramp (afternoon)

In addition, Alternative 3 would worsen LOS compared to the No-Build Alternative, resulting in the demand to exceed capacity (i.e., LOS F) at the following location during the Design Year (2047):

- From Bollinger Canyon Road off-ramp to between Bollinger Canyon Road off-ramp and Bollinger Canyon Road Loop on-ramp (morning).

According to the intersection analysis completed for the Project (DKS Associates, 2023b), Alternative 3 would not worsen LOS at any of the 16 evaluated intersections. Alternative 3 would improve LOS compared to the No-Build Alternative at the following intersections: I-680 Northbound Ramps and Livorna Road (LOS F to LOS C), and North Main Street and Penniman Way (LOS B to LOS A), and I-680 Northbound Ramps and Treat Boulevard (LOSC to LOS B), Oak Road and Treat Boulevard (LOS D to LOS C), and I-680 Northbound Ramps and Willow Pass Road (LOS D to LOS C). Intersection delay would increase at the following intersections: Lawrence Way and Penniman Way (10.2 to 10.3 minutes), Oak Road and Buskirk Avenue (37.9 to 41.3 minutes), and I-680 Ramp and Contra Costa Boulevard (1.1 to 1.3 minutes).

Alternative 5

Alternative 5 would improve LOS from Stone Valley Road Diagonal off-ramp to between Olympic Boulevard/SR-24 Westbound off-ramp and Olympic Boulevard on-ramp in the

afternoon peak period for the Design Year (2047). Unlike Alternatives 1C, 2, and 3, Alternative 5 would worsen LOS between Monument Boulevard off-ramp and the North Main Street off-ramp in the Opening Year (2027) morning peak period. Alternative 5 would also worsen LOS from the Monument Boulevard off-ramp to El Pintado Road in the Design Year (2047) morning peak period. However, Alternative 5 would, to a more limited extent than Alternatives 1C, 2, and 3, improve LOS to better than the No-Build Alternative in locations freed from queue spillback due to the braided ramps.

Alternative 5 would worsen LOS compared to the No-Build Alternative, resulting in the demand to exceed capacity (i.e., LOS F) at the following location during the Opening Year (2027):

- From the weave between Lawrence Way on-ramp and Treat Boulevard off-ramp to the weave between Oak Road/Buskirk Avenue on-ramp and Contra Costa Boulevard off-ramp (morning).

In addition, Alternative 5 would worsen LOS compared to the No-Build Alternative resulting in the demand to exceed capacity (i.e., LOS F) at the following locations during the Design Year (2047):

- Between El Pintado Road on-ramp and Stone Valley Road Diagonal off-ramp (morning)
- Between Stone Valley Road Loop off-ramp and Stone Valley Road Loop on-ramp (morning)
- Between Livorna Road on-ramp and Rudgear Road off-ramp (morning)
- From between Rudgear Road off-ramp and Danville Boulevard on-ramp to between North Main Street off-ramp and Lawrence Way on-ramp (morning)
- From between Treat Boulevard off-ramp and Truck Scales on-ramp to the weave between Oak Road/Buskirk Avenue on-ramp and Contra Costa Boulevard off-ramp (morning)
- Weave between Monument Boulevard on-ramp and SR-242 off-ramp (morning)

According to the intersection analysis completed for the Project (DKS Associates, 2023b), Alternative 5 would not worsen LOS at any of the 16 evaluated intersections. Alternative 5 would improve LOS compared to the No-Build conditions at the following intersection: Oak Road and Buskirk Avenue (LOS D to LOS C). Intersection delay would increase at the following intersections: I-680 Northbound Ramps and Rudgear Road (54.4 to 55 minutes), Lawrence Way and Penniman Ways (10.2 to 10.5 minutes), North Main Street and San Luis Road (15.5 to 15.7 minutes), I-680 Northbound Ramps and Treat Boulevard (23.8 to 24 minutes), I-680 Northbound Ramps and Willow Pass Road (36.6 to 39.4 minutes), Burnett Avenue and Diamond Boulevard (37.7 to 39.9 minutes).

Measures of Effectiveness

Table 2.1.8-19 and Table 2.1.8-20 present the measures of effectiveness for the Build Alternatives compared to the No-Build Alternative and the other Build Alternatives for the Opening Year (2027) and Design Year (2047), respectively. Overall, all Build Alternatives would improve operations for the afternoon peak period. ADA components would be implemented at Treat Boulevard and North Main Street/Lawerence Way. Any impacted curb ramps that are not currently ADA-compliant would be upgraded.

Table 2.1.8-19. Network Measures of Effectiveness for Opening Year (2027)

Measures of Effectiveness	No-Build	Alt 1C	Alt 2 *	Alt 3	Alt 5
Morning Peak Hours					
VMT[1]	397,307	407,640	404,247	407,508	396,631
VHD[2]	2,108	2,277	2,335	2,301	2,435
Average delay (second/vehicle served)	137	147	152	150	160
Average delay (second/mile)	19	20	21	20	22
Vehicles served[3]	55,246	55,623	55,348	55,283	54,888
Vehicles unserved[4]	126	162	197	162	129
Average Trip Length (mile/vehicle)	7.19	7.33	7.30	7.37	7.23
I-680 Maximum Individual Delay (minutes)[5]	10.7	12.0	12.1	12.0	12.8
I-680 Managed Lane Travel Time Savings (minutes)	7.0	8.5	8.6	8.4	8.3
I-680 Improvement Limits (Livorna Road to Waterfront Road/Marina Vista Avenue):					
VHD[2]	268	203	204	220	606
Average delay (second/vehicle served)	27	20	20	22	61
I-680 maximum individual delay (minutes)[5]	0.9	0.8	0.8	0.8	3.0
Vehicles served[2]	36,314	36,627	36,354	36,235	35,897
SR-24 (Upper Happy Valley to I-680):					
VHD[2]	93	42	44	43	44
Average delay (second/vehicle served)	23	10	11	11	11

Measures of Effectiveness	No-Build	Alt 1C	Alt 2 *	Alt 3	Alt 5
Vehicles served[3]	14,250	14,471	14,467	14,467	14,409
I-680 Improvement Limits and SR-24:					
Total VHD	360	245	248	263	650
Afternoon Peak Hours					
VMT[1]	1,113,689	1,172,083	1,161,273	1,172,521	1,111,507
VHD[2]	15,218	12,513	11,212	13,213	13,509
Average delay (second/vehicle served)	304	247	221	261	271
Average delay (second/mile)	49	38	35	41	44
Vehicles served[3]	180,312	182,070	182,313	181,941	179,387
Vehicles unserved[4]	166	166	385	201	389
Average Trip Length (mile/vehicle)	6.18	6.44	6.37	6.44	6.20
I-680 Maximum Individual Delay (minutes)[5]	25.7	23.8	25.2	28.1	23.1
I-680 Managed Lane Travel Time Savings (minutes)	10.7	19.9	19.4	22.8	13.6
I-680 Improvement Limits (Livorna Road to Waterfront Road/Marina Vista Avenue):					
VHD[2]	5,817	4,078	3,009	3,229	4,762
Average delay (second/vehicle served)	180	124	91	99	149
I-680 maximum individual delay (minutes)[5]	13.4	6.1	3.7	7.5	12.0
Vehicles served[2]	116,097	118,415	118,452	117,876	115,294
SR-24 (Upper Happy Valley to I-680):					
VHD[2]	2,524	1,170	293	371	1,848
Average delay (second/vehicle served)	167	77	19	24	123
Vehicles served[3]	54,290	55,032	55,118	55,619	54,123
I-680 Improvement Limits and SR-24:					
Total VHD	8,341	5,248	3,302	3,600	6,610

Measures of Effectiveness	No-Build	Alt 1C	Alt 2 *	Alt 3	Alt 5

Source: (DKS Associates, 2023a)
Notes: SR = State Route; VHD = vehicle hours delay; VMT = vehicle miles travelled
[1] VMT is for the VISSIM™ study area, I-680, Alcosta Boulevard to Waterfront Road/Marina Vista Avenue and SR-24, east of Upper Happy Valley Road.
[2] VHD is the delay calculated relative to the desired speed for each vehicle using the study corridor.
[3] Vehicles served along freeways and ramps during the study period.
[4] Vehicles unable to enter the model network at either freeway mainline or ramps during the study period.
[5] Maximum individual delay calculated based on a free flow speed of 65 mph.
* Alternative 2 is the preferred alternative.

Table 2.1.8-20. Network Measures of Effectiveness for Design Year (2047)

Measures of Effectiveness	No-Build	Alt 1C	Alt 2 *	Alt 3	Alt 5
Morning Peak Hours					
VMT[1]	425,286	437,299	433,312	437,210	412,326
VHD[2]	4,127	3,956	4,101	4,087	5,913
Average delay (second/vehicle served)	256	242	255	252	381
Average delay (second/mile)	35	33	34	34	52
Vehicles served[3]	58,133	58,942	58,258	58,467	55,941
Vehicles unserved[4]	733	964	930	981	688
Average Trip Length (mile/vehicle)	7.32	7.42	7.44	7.48	7.37
I-680 Maximum Individual Delay (minutes)[5]	20.8	22.5	22.5	22.3	34.1
I-680 Managed Lane Travel Time Savings (minutes)	14.2	16.1	16.1	15.8	26.7
I-680 Improvement Limits (Livorna Road to Waterfront Road/Marina Vista Avenue):					
VHD[2]	376	249	265	311	1,809
Average delay (second/vehicle served)	36	23	25	29	181
I-680 maximum individual delay (minutes)[5]	1.1	0.9	0.9	1.0	10.5
Vehicles served[2]	37,874	39,298	38,593	38,753	35,943
SR-24 (Upper Happy Valley to I-680):					
VHD[2]	545	234	290	303	321

Measures of Effectiveness	No-Build	Alt 1C	Alt 2 *	Alt 3	Alt 5
Average delay (second/vehicle served)	131	53	67	70	75
Vehicles served[3]	14,934	15,743	15,638	15,608	15,472
I-680 Project Limits and SR-24:					
Total VHD	921	482	555	614	2,130
Afternoon Peak Hours					
VMT[1]	1,168,624	1,217,084	1,229,542	1,232,608	1,170,678
VHD[2]	27,101	25,390	22,607	27,046	23,778
Average delay (second/vehicle served)	499	468	414	503	439
Average delay (second/mile)	83	75	66	79	73
Vehicles served[3]	195,555	195,293	196,467	193,584	195,040
Vehicles unserved[4]	5,931	5,989	6,079	5,484	6,459
Average Trip Length (mile/vehicle)	5.98	6.23	6.26	6.37	6.00
I-680 Maximum Individual Delay (minutes)[5]	56.9	49.0	49.2	52.9	47.7
I-680 Managed Lane Travel Time Savings (minutes)	30.8	37.0	35.3	40.8	32.1
I-680 Improvement Limits (Livorna Road to Waterfront Road/Marina Vista Avenue):					
VHD[2]	7,947	5,088	5,331	6,498	5,496
Average delay (second/vehicle served)	237	145	156	194	165
I-680 maximum individual delay (minutes)[5]	15.6	6.6	5.7	10.9	10.3
Vehicles served[2]	120,787	126,355	122,775	120,671	120,250
SR-24 (Upper Happy Valley to I-680):					
VHD[2]	2,543	3,733	567	3,843	2,891
Average delay (second/vehicle served)	164	244	36	252	188
Vehicles served[3]	55,727	55,126	57,129	54,989	55,413

Measures of Effectiveness	No-Build	Alt 1C	Alt 2 *	Alt 3	Alt 5
I-680 Improvement Limits and SR-24:					
Total VHD	10,490	8,821	5,898	10,342	8,387

Source: (DKS Associates, 2023a)
Notes: SR = State Route; VHD = vehicle hours delay; VMT = vehicle miles travelled.
[1] VMT is for the VISSIM™ study area, I-680, Alcosta to Waterfront Road/Marina Vista Avenue and SR-24, east of Upper Happy Valley Road.
[2] VHD is the delay calculated relative to the desired speed for each vehicle using the study corridor.
[3] Vehicles served along freeways and ramps during the study period.
[4] Vehicles unable to enter the model network at either freeway mainline or ramps during the study period.
[5] Maximum individual delay calculated based on a free flow speed of 65 mph.
* Alternative 2 is the preferred alternative.

The proposed Project is being designed to retain existing pedestrian and bicycle circulation routes, and no arterial roadways would be closed permanently. As described in Section 2.1.3, *Parks and Recreational Facilities*, Alternatives 1C, 2, and 3 would require permanently shifting the Iron Horse Regional Trail under the Rudgear Road Undercrossing Bridge. In accordance with Measures (**PR-3** and **PR-4**), CCTA would work with the East Bay Regional Park District to identify a location to shift the trail under the bridge during final design.

Alternative 1C

Alternative 1C would substantially improve freeway segment speed, travel time (general-purpose and managed lanes), VHD, and throughput (vehicle and person) on northbound I-680 during the afternoon peak hours compared to the No-Build Alternative (DKS Associates, 2023a). In terms of vehicle throughput and delay, the additional lane results in increases in demand, longer average trip lengths, higher VMT, and a higher number of vehicles served compared to the No-Build Alternative. While Alternative 1C would not eliminate any bottlenecks, the added capacity would result in higher throughput for the bottleneck sections and reduced queueing and delay associated with the bottlenecks north of SR-24. The reduced queuing results in lower average delay per vehicle and VHD in the Traffic Operations Study Area during the afternoon peak period. While Alternative 1C would benefit the traffic operations along I-680, the queues approaching the bottlenecks north of SR-24 would extend onto eastbound SR-24, deteriorating operations on eastbound SR-24. However, the total VHD for I-680 and SR-24 would be substantially less than the No-Build Alternative during the morning and afternoon peak periods. Therefore, Alternative 1C would improve overall operations on I-680 compared to the No-Build Alternative for both the morning and afternoon peak periods.

Alternative 2 (Preferred Alternative)

Alternative 2 has been selected as the preferred alternative. Alternative 2 would substantially improve freeway segment speed, travel time (general-purpose and managed lanes), VHD, vehicle throughput, and person throughput on northbound I-680

during the afternoon peak hours compared to the No-Build Alternative (DKS Associates, 2023a). Table 2.1.8-19 and Table 2.1.8-14 summarize the measures of effectiveness for Alternative 2 compared to the No-Build Alternative and the other Build Alternatives for the Opening Year (2027) and Design Year (2047), respectively. As with Alternative 1C, the additional lane results in increases in demand, longer average trip lengths, higher VMT, and a higher number of vehicles served compared to the No-Build Alternative. While Alternative 2 would not eliminate any bottlenecks completely, the added capacity would also result in higher throughput for the bottleneck sections and reduced queueing and delay associated with the bottlenecks north of SR-24. The reduced queuing also results in lower average delay per vehicle and VHD in the Traffic Operations Study Area during the afternoon peak period. Unlike Alternative 1C and 3, vehicles traveling on SR-24 would have access to an empty express lane where it begins, resulting in improved operations on eastbound SR-24.

Therefore, Alternative 2 would improve overall operations on I-680 compared to the No-Build Alternative for both the morning and afternoon peak periods. The results indicate that the combination of the extended but non-continuous express lane and the braided ramp improvements provide benefits on I-680 similar to Alternatives 1C and 3, while also improving operations on SR-24.

Alternative 3

Alternative 3 would improve freeway segment speed and VHD and substantially improve travel time (general-purpose and managed lanes) and throughput (vehicle and person) on northbound I-680 during the afternoon peak hours compared to the No-Build Alternative. Table 2.1.8-19 and Table 2.1.8-14 summarize the measures of effectiveness for Alternative 3 compared to the No-Build Alternative and the other Build Alternatives for the Opening Year (2027) and Design Year (2047), respectively. As with Alternatives 1C and 2, the additional lane results in increases in demand, longer average trip lengths, higher VMT, and a higher number of vehicles served compared to the No-Build Alternative. While Alternative 3 would not eliminate any bottlenecks completely, the added capacity would result in higher throughput for the bottleneck sections and reduced queueing and delay associated with the bottlenecks north of SR-24. The reduced queuing results in lower average delay per vehicle and VHD in the Traffic Operations Study Area during the afternoon peak period. Although Alternative 3 would benefit the traffic operations along I-680, the queues approaching the bottlenecks north of SR-24 would extend onto eastbound SR-24, deteriorating the operations on eastbound SR-24. However, the total VHD for I-680 and SR-24 would be substantially less than the No-Build Alternative during the morning and afternoon peak periods. Therefore, Alternative 3 would improve overall traffic and transportation operations compared to the No-Build Alternative for both the morning and afternoon peak periods.

Alternative 5

Alternative 5 would improve freeway segment speed and VHD and substantially improve travel time (general-purpose and managed lane) on northbound I-680 during the afternoon peak hours compared to the No-Build Alternative (DKS Associates,

2023a). Since Alternative 5 reduces capacity, throughput (vehicle and person) is forecasted to deteriorate compared to the No-Build Alternative. Table 2.1.8-19 and Table 2.1.8-14 present the measures of effectiveness for Alternative 5 compared to the No-Build Alternative and the other Build Alternatives for the Opening Year (2027) and Design Year (2047), respectively. Alternative 5 shows improvements in maximum individual delay, average delay, and VHD metrics compared to the No-Build Alternative, due to reduced vehicle weaving and improved operations provided by the braided ramp at the North Main Street/Lawrence Way and Treat Boulevard Interchanges. Caltrans screened Alternative 5 from requiring VMT analysis under CEQA (SB 743) in accordance with the TAC (California Department of Transportation, 2020b; 2025), which is described further in Section 3.2.17, *Transportation*.

Unlike Alternatives 1C, 2, and 3, a new bottleneck between the Oak Road on-ramp and Contra Costa Boulevard off-ramp would develop under Alternative 5 during the morning peak period, which is due to reduced freeway capacity. Maximum queues would extend to the Truck Scale off-ramp (approximately 1.6 miles) by the Opening Year (2027) and through the Livorna Road and El Pintado Road bottlenecks, as far south as Bollinger Canyon Road (approximately 14.5 miles), by the Design Year (2047). In addition, Alternative 5 is the only alternative that results in managed lane slowdowns north of the El Pintado Road bottleneck in the Opening Year (2027) and Design Year (2047). Congestion and slowing would occur approaching Contra Costa Boulevard due to friction between the managed lane and the congested general-purpose lanes. Alternative 5 would also result in a slowdown around the South Main Street off-ramp in addition to the areas of slowdown.

Ultimately, Alternative 5 would reduce mainline capacity compared to the No-Build Alternative (conversion to express lane), but the braided ramps and the conversion to express lane generally offset the capacity reduction and would result in improved overall mainline operations compared to the No-Build Alternative for the afternoon peak period. However, Alternative 5 would increase travel time and delay in the morning peak period.

2.1.8.4 Summary

Alternative 2 has been selected as the preferred alternative. As described above, Alternative 2 would provide the most operational benefits on I-680 and would not deteriorate traffic operations on SR-24.

During construction, Alternative 2 would result in temporary freeway, lane, and ramp closures on I-680 and temporary closures of local streets and/or detours of trails. Alternative 2 would avoid a long-term detour of the Olympic Boulevard off-ramp. Alternative 2 would require a 1-month detour of the North Main Street off-ramp, which would result in a maximum delay of up to 5.8 minutes. During final design, a more rigorous analysis would be conducted of the North Main Street ramp closures and a TMP would be developed, which would minimize construction-related delays. In accordance with Measure ***TRAN-1****, no two consecutive off-ramps or two consecutive on-ramps in the same direction will be closed concurrently during construction.*

*Measures **PR-1** through **PR-3** would be implemented to minimize or avoid impacts on recreational trails. Therefore, impacts would not be adverse.*

2.1.8.5 Avoidance, Minimization, and/or Mitigation Measures

Measures **PR-1** through **PR-3** would be implemented to minimize or avoid impacts to recreational trails as further described in Section 2.1.3, *Parks and Recreational Facilities*. In addition, the following avoidance and minimize measure would be implemented:

TRAN-1 No two consecutive off-ramps or two consecutive on-ramps in the same direction will be closed concurrently during construction.

The following mitigation measures are proposed for VMT impacts under CEQA, which are described further in Section 3.2.17, *Transportation*:

TRAN-MM-1 **I-680 Express Bus Service**. CCTA will work with County Connection and Livermore Amador Valley Transit Authority to implement a new I-680 express bus service and provide funding to rebrand, refurbish, and upgrade six existing buses for interim service (before hydrogen fuel-cell buses are available) and acquire six hydrogen fuel-cell buses (and one spare) when they are available for purchase.

TRAN-MM-2 **Shared Mobility Hubs**. CCTA will pursue funds and ensure the implementation of the following mobility hubs: Bollinger Canyon Road, Walnut Creek BART Station, and Martinez Amtrak Station. These hubs will be designed to support I-680 Express Bus Service as well as other fixed-route transit services. The hubs may include mobility hub improvements and Mobility-on-Demand/Mobility-as-a-Service application and could potentially include additional mobility services, such as microtransit and/or increased eBike/eScooter operations.

TRAN-MM-3 **Transportation Demand Management (TDM) Program Augmentation**. CCTA will pursue funds and ensure the implementation of a countywide TDM Program for the I-680 Express Lane Completion Project. This program will consist of enhancing existing and creating new TDM incentives within Contra Costa County. The program will not supplant, supersede, or replace current CCTA TDM initiatives funded by the Transportation Fund for Clean Air (TFCA) or Measure J. CCTA will operate the program through the County's existing TDM program (511 Contra Costa).

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2.1.9 Visual/Aesthetics

2.1.9.1 Regulatory Setting

The National Environmental Policy Act (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 United States Code [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.

The California Environmental Quality Act (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]).

California Streets and Highways Code Section 92.3 directs the California Department of Transportation (Caltrans) to use drought resistant landscaping and recycled water, when feasible, and incorporate native wildflowers and native and climate-appropriate vegetation into the planting design, when appropriate.

Interstate 680 (I-680) is an Officially Designated State Scenic Highway from Mission Boulevard to the State Route (SR) 24 Interchanged in the city of Walnut Creek. SR-24 is an Officially Designated State Scenic Highway from Caldecott Tunnel to the I-680 Interchange in the city of Walnut Creek. The following five elements are required for the official designation of Scenic Highways (California Department of Transportation, 2012):

- Regulation of land use and density of development,
- Detailed land and site planning,
- Control of outdoor advertising,
- Careful attention to and control of earthmoving and landscaping,
- The design and appearance of structures and equipment.

2.1.9.2 Affected Environment

The information presented in this section is from the *Visual Impact Assessment* (VIA) for the proposed Project (Haygood & Associates, 2022), which was completed in August 2022; a separate memorandum for Alternative 5, which was prepared in November 2022 (Haygood, 2022); and a second separate memorandum regarding reducing the length of the post mile (PM) limits and the Project Study Limits, which was completed in November 2023 (Haygood, 2023). The terminology and methodology used within the

VIA are based on the *Visual Impact Assessment for Highway Projects* guidelines (Federal Highway Administration, 1981), as described below.

For purposes of this section, the Visual Resources Study Area encompasses the Project corridor. The Project corridor is defined as the area of land that is visible from, adjacent to, and outside the Project Study Limits and is determined by topography, vegetation, and viewing distance. As identified in the VIA, the Project corridor is based on the prior Project Study Limits (PM R4.4 to PM 24.5; Figure 1-10). The Project Study Limits were reduced to PM R10.0 to PM 23.2 after completion of the VIA.

Methods for Data Collection and Analysis

Visual Resource

Visual resources are defined and identified by visual character and visual quality.

Visual character includes attributes such as form, line, color, texture, dominance, and glare. Visual character is neither inherently "good" nor "bad." Changes in visual character can be evaluated when it is compared to the viewer response to that change. Changes in visual character can be identified by how visually compatible a project would be with the existing condition by using visual character attributes as an indicator.

For this Project, the following attributes were considered:

- Form – visual mass or shape
- Line – edges or linear definition
- Color – reflective brightness (light, dark) and hue (red, green)
- Texture – surface coarseness
- Dominance – position, size, or contrast
- Scale – apparent size as it relates to the surroundings
- Diversity – variety of visual patterns
- Glare – reflective surfaces and brightness

Visual quality is evaluated by identifying the vividness, intactness, and unity present in the Project corridor. Public attitudes validate the assessed level of quality and predict how changes to the Project corridor can affect these attitudes. This process helps identify specific methods for addressing each visual impact that may occur as a result of the Project. Visual quality's three attributes are assessed on a five-point scale—low, moderately low, moderate, moderately high, high. The three criteria for evaluating visual quality are defined as follows:

- *Vividness* is the extent to which the landscape is memorable and associated with distinctive, contrasting, and diverse visual elements; landscape is free from non-typical visual intrusions.

- *Intactness* is the integrity of visual features in the landscape and the extent to which the existing landscape is free from non-typical visual intrusions.

- *Unity* is the extent to which all visual elements combine to form a coherent, harmonious visual pattern.

Resource Change

Resource change is assessed by evaluating the visual character and the visual quality of the visual resources that comprise the Project corridor before and after the construction of the proposed Project. Resource change is a major variable in the equation that determines visual impacts.

Viewer Response

The VIA (Haygood & Associates, 2022) identified two viewer groups that could be impacted by the Project: highway neighbors and highway users. Each viewer group has its own particular level of viewer exposure and viewer sensitivity, resulting in distinct and predictable visual concerns for each group, which help to predict its response to visual changes.

Viewer exposure is a measure of the viewer's ability to see a particular object. High viewer exposure helps predict that viewers will have a response to a visual change. Viewer exposure has the following three attributes:

- *Location* relates to the position of the viewer in relationship to the object being viewed. The closer the viewer is to the object, the more exposure.

- *Quantity* refers to how many people see the object. The more people who can see an object or the greater frequency an object is seen, the more exposure the object has to viewers.

- *Duration* refers to how long a viewer is able to keep an object in view. The longer an object can be kept in view, the more exposure.

Viewer sensitivity is a measure of the viewer's recognition of a particular object. High viewer sensitivity helps predict that viewers will have a high concern for any visual change. Viewer sensitivity has the following three attributes:

- *Activity* relates to the preoccupation of viewers—are they preoccupied, thinking of something else, or are they truly engaged in observing their surroundings. The more they are actually observing their surroundings, the more sensitivity viewers will have to changes in visual resources.

- *Awareness* relates to the focus of view—the focus is wide and the view general or the focus is narrow and the view specific. The more specific the awareness, the more sensitive a viewer is to changes in visual resources.

- *Local values* and *attitudes* also affect viewer sensitivity. If the viewer group values aesthetics in general, or if a specific visual resource has been protected by local, State, or national designation, it is likely that viewers will be more sensitive to changes in visual resources.

Viewers are people whose views of the landscape may be altered by the proposed Project, either because the landscape itself has changed, or their perception of the landscape has changed. There are two major types of viewer groups for highway projects: highway users and highway neighbors.

Highway Users

No pedestrian or bicycle traffic is allowed on I-680, so highway users consist of motor vehicle drivers and passengers. Motorists' duration of exposure while on I-680 varies from moderate to high depending on travel speed and highway congestion. Daily commuters have moderate to high awareness and sensitivity to views from the road due to the amount of time spent on the highway each day. Those who experience congested traffic conditions would tend to focus views on the highway itself. Drivers traveling at normal highway speeds usually focus attention on long-range, non-peripheral views. Scenic vistas of mountains and ridges visible through the corridor to the south and north are the most available to motorists regardless of traffic congestion. Scenic vistas to the east and west are available to varying degrees depending on travel speed and congestion. Passengers are anticipated to have a higher level of awareness and sensitivity to a wide range of views. They would experience high levels of sensitivity to Project features added to the highway that would intrude upon their views of scenic resources. Existing and forecasted vehicle occupancies, vehicle classifications, and bottlenecks are provided in Section 2.1.8, *Traffic and Transportation/Pedestrian and Bicycle Facilities*.

Highway Neighbors

The following highway neighbors were identified within the Visual Resources Study Area:

- Community Residents. The Visual Resources Study Area overlaps the communities of San Ramon, Danville, Alamo, Walnut Creek, Concord, Pacheco, and Martinez. There are single-family residential communities on local streets with long durations of exposure to views in San Ramon, Danville, Alamo, Concord, and Martinez. Walnut Creek is composed of single- and multi-family residences on local streets adjacent to Project features where residents have long-duration exposure to views of Project features. Meanwhile, Pacheco is composed of mobile-home residences on local streets adjacent to Project features where residents have long-duration exposure to

views of Project features. Because of long durations of exposure to views from their residential and neighborhood vantage points, residents are the viewer group considered to be the most concerned about the ways in which projects bring about changes within their viewshed. Among the scenic resources identified by the local communities within the Visual Resources Study Area are Mount Diablo, scenic ridges, sloping foothills, and woodlands.

- Local Streets. In the town of Danville and cities of San Ramon, Alamo, Walnut Creek, Concord, Pacheco, and Martinez, several hundred motorists, bicyclists, and persons using motorized scooters have short to moderate durations of exposure to views of the highway and Project features from vantage points on local streets. Pedestrians on local streets would have moderate to moderately low levels of sensitivity to Project features depending on the changes made to the character and quality of the viewshed.

- Recreation Areas. As there are existing recreational facilities in the vicinity of the proposed Project and within the Visual Resources Study Area, bicyclists, pedestrians, and park users have moderate durations of exposure to views toward Project features. Their exposure levels would range from moderately low to moderately high depending on their distance from Project features; intervening elements, such as fences and vegetation; and their levels of interest. Project features would be visible from the Iron Horse Regional Trail, the Acalanes Ridge Open Space South Trail, and the Contra Costa Canal Trail/Briones to Mount Diablo Regional Trail.

- Schools. The level of visual exposure of persons attending school would be moderately low when gathering and playing in outdoor sitting and recreation areas and low while engaged in studies. The exposure to views would be limited. The VIA (Haygood & Associates, 2022) identified 16 schools within 0.25 mile of I-680. Only three of these schools would have views of the Project features—Danville Montessori School, Futures Academy, and John F. Kennedy University/National University. The other schools do not have views of I-680 due to intervening structures, topography, and/or trees that block views of the highway and proposed Project improvements.

- Churches. Those who gather at spiritual places often visit outside at entrances and patios and also view the environment through windows. The level of churchgoers' visual exposure may vary from low to moderate. The VIA (Haygood & Associates, 2022) identified 12 churches adjacent to I-680. Of these, only the Kingdom Hall of Jehovah's Witnesses would potentially have views of Project features, which are densely screened by intervening trees and highway soundwalls.

- Commercial Areas. Within the Visual Resources Study Area, there are single-service commercial land uses, commercial complexes, and medical clinics within close range of the Project features. Some are engaged in high traffic-volume commerce. An estimated total of several hundred viewers a day visit

these sites and have short- to moderate-duration views of the Project features. Commercial employees and patrons would likely have moderate to low levels of exposure to the Project features.

- Industrial/Public Agency Areas. In addition to commercial land uses, there are also industrial and public agency land uses adjacent to I-680, particularly north of SR-4. Persons within these land uses are less sensitive to Project changes and features than commercial areas due to their focus on their tasks, low volumes of pedestrian traffic, moderately low to low levels of exposure duration and therefore sensitivity to the Project features. It is anticipated that their response to Project features would be low.

Visual Impact

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. Visual impact is typically given a rating from low to high.

Visual Environment

Visual Setting

The Visual Resource Study Area is located on I-680 between 1 mile south of the Benicia-Martinez Bridge Toll Plaza and the I-680 Northbound on-ramp at the Crow Canyon Road Interchange in San Ramon, Contra Costa County, California. The Project is located in the East Bay region of the San Francisco Bay Area of northern California. The landscape is characterized by flat valley terrain between Crow Canyon Road in San Ramon and Diablo Road in Danville; hilly terrain between Diablo Road in Danville and Lilac Drive in Walnut Creek; and variably hilly and flat terrain between Lilac Drive in Walnut Creek and south of the Benicia-Martinez Bridge Toll Plaza. The valley is surrounded on all sides by mountains and ridges. To the east is Mount Diablo and foothills, the most scenic visual resource in the region. The Trampas Ridge is visible to the west, and the Keller Ridge is to the east beyond Mount Diablo. The Briones Hills are to the north and the Apperson and Wauhab Ridges are to the south. The upper regions of the hills and mountains remain natural in character due to their status as protected open space.

The land use within the corridor is primarily suburban. South of SR-4, individual land uses adjacent to the Project corridor include single- and multi- family residential, mobile home residential, commercial, schools, churches, airport, golf course recreational, parks, trails, and riparian corridors. North of SR-4, proceeding from south to north, individual land uses are county government, single-family residential, commercial, recreation trail, industrial, Waterbird Regional Preserve, and wetlands as I-680 approaches the Benicia-Martinez Bridge.

I-680 is an Officially Designated State Scenic Highway between SR-24 in Walnut Creek and Mission Boulevard in Fremont. Sections of I-680 are also Classified Landscaped

Freeway in Contra Costa County between the following PM, which assists in the regulation of outdoor advertising placement:

- PM R3.90 to 9.05
- PM R12.16 to 20.54
- PM 22.48 to 22.81
- PM 24.55 to 25.01
- PM R9.22 to R12.05
- PM 21.19 to 21.71
- PM 24.47 to 24.95

According to the VIA prepared for the Project, the Visual Resources Study Area or Project corridor is similar in character and visual resources; therefore, the Project corridor was reviewed as one visual assessment unit (VAU), which includes views of the proposed Project from the highway and local streets. This VAU is depicted in Figure 2.1.9-1 and is based on the old Project Study Limits (See Figure 1-9). Because it is not feasible to analyze all the views in which the proposed Project would be seen, it is necessary to select a number of key viewpoints (KV) within the VAU that would most clearly demonstrate the change in the Project's visual resources. KV also represent the viewer groups that have the highest potential to be affected by the Project, considering exposure and sensitivity.

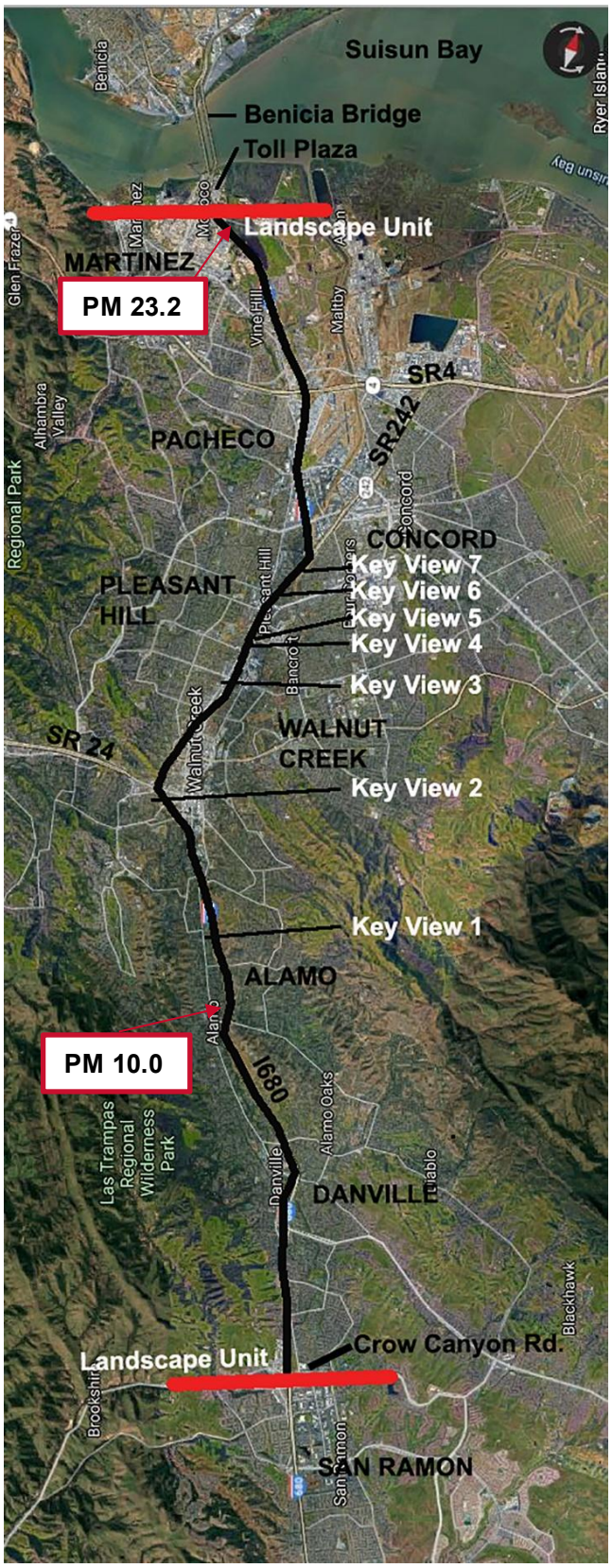


Figure 2.1.9-1. Visual Assessment Unit and Key Views

Visual Assessment Unit – I-680 from the Crow Canyon Road Northbound On-ramp to just south of the Benicia- Martinez Bridge Toll Plaza (CC 680 PM R4.4 to 24.5)

The I-680 corridor between Crow Canyon Road in San Ramon and just south of the Benicia-Martinez Bridge Toll Plaza in Martinez is within a suburban environment. Land uses east of the highway include residential, commercial, Buchanan Field Airport, industrial, county government, parks, golf course recreational, trails, riparian corridors, and a nature preserve. Land uses west of the highway include residential, commercial, state government, industrial, parks, trails, and open space preserve. Interspersed within residential land uses adjacent to the corridor are schools and places of worship. Commercial land uses are adjacent to the I-680 interchanges at Crow Canyon Road, Sycamore Valley Road, Diablo Road, El Cerro Boulevard, Stone Valley Road, Olympic Boulevard, SR-24, Ygnacio Valley Road, North Main Street, Treat Boulevard, Contra Costa Boulevard, Monument Boulevard, Willow Pass Road, Concord Avenue, SR-4, Pacheco Boulevard, and Marina Vista Avenue. Heavy industrial, open space, and park/recreation land uses are between Pacheco Boulevard and the Benicia-Martinez Bridge.

Existing Visual Character

The existing character of the I-680 corridor between Crow Canyon Road to south of the Benicia-Martinez Bridge Toll Plaza is a suburban environment within a linear valley surrounded by mountainous terrain.

Views beyond I-680 include scenic vistas of natural features, colors, and textures including Mount Diablo and foothills to the east, the Keller Ridge to the east of Mount Diablo, the Briones Hills to the northwest, the Las Trampas Ridge to the southwest, and distant Wauhab and Apperson Ridges to the south. Also included are views of the horizon, groves of mature trees, and the grassy foothills of Mount Diablo that extend to the west, through which the I-680 corridor passes.

The base of Mount Diablo is approximately 5 miles east of the I-680/Crow Canyon Road Interchange in San Ramon, and approximately 4 miles east of the I-680/SR-24 Interchange. The steep mountain slopes terminate in the north at Ygnacio Valley Road in Walnut Creek. The Keller Ridge east of Mount Diablo extends to the north, decreasing in height near Port Chicago. The base of the Keller Ridge is approximately 4.75 miles east of the I-680/SR-242 Interchange and approximately 3.20 miles east of the I-680/SR-4 Interchange. The I-680 alignment is within the foothills of Mount Diablo and in the lowlands and canyons between Mount Diablo and the Trampas Ridge to the west. North of Mount Diablo, I-680 is in the lowlands between the Keller Ridge to the east and the Briones Hills to the west. The topography of the landforms in the region and natural features on the slopes and ridges are among the characteristics that are the source of I-680 being an Officially Designated State Scenic Highway between SR-24 and beyond the southern Project Study Limits to Santa Clara County.

Views of the distant scenic resources from I-680 include memorable views of landforms, grasslands, and oak woodlands. Between north of Sycamore Valley Road in Danville

and Rudgear Road in Walnut Creek, where I-680 is within the western foothills of Mount Diablo, the slopes block long range views of the mountain to the east, except through local street corridors. No intervening landforms block views of the Trampas Ridge to the west, except near the southern Project limit at Crow Canyon Road where foothills block distant views to the west. There are dense groves of trees Beyond the highway to the east and west in adjacent properties, particularly in residential land uses, but also in local streets and commercial areas. Views from the highway include diverse natural forms, textures, and colors in the dense groves of mature trees and screening vegetation.

The character of near- and medium-range views from I-680 change from views of a diverse natural environment to views of structures between Sunvalley Boulevard and SR-4. To the west of I-680 is a regional shopping center and commercial services. Views include single-story, long rectangular buildings that are simple in form, line, and texture, with similar light tan colors. Paved parking lots with vehicles are visible between large clusters of rectangular buildings. A row of trees on private property next to the Caltrans right-of-way (ROW) fence provides views of a natural environment. They do not screen views of the structures because the trees are widely spaced, and screening foliage has been removed from the lower regions of the trees' trunks. East of the highway, between Willow Pass Road and Concord Avenue, there are views of a regional shopping center with one- and two-story buildings. The character is similar to what is visible to the west, although more of the buildings are two-stories in height. Also, in this zone are views of four-story, rectangular office buildings. Although large in mass and simple in shape and line, the character of the structures is diverse. The diversity is visible in the architectural design that is a combination of light gray concrete geometric rectangles and squares that frame large and small windows of dark, blue-colored reflective glass. Large parking lots and vehicles are visible between buildings.

Northeast of the Concord Avenue Interchange is a recreational golf course adjacent to Buchannan Field Airport. Views are of a diverse natural environment with trees and grass. Structures are visible north of the golf course to just north of Center Drive. Buildings are simple, single-story warehouse-style rectangular buildings. North of SR-4, I-680 rises in elevation and goes through the lower slopes of the Briones Hills that are visible to the west. Medium to long range views from the highway are blocked by the grass covered hills. Diverse vegetation is visible east and west of the highway in the grass covered slopes and dark green trees and shrubs. Single-family residences are beyond both sides of the highway in the adjacent low-lying areas. Residences are also visible on the higher hill slopes. The character of the environment changes between just south of Service Road and the Benicia-Martinez Bridge Toll Plaza. Structures are industrial, serving the petroleum and shipping industries. Large round storage tanks painted light tan, and tall, gray, deeply textured venting stacks are visible to the west and in the distance to the northeast. In near views to the east are wetlands fed by the waters of the Carquinez Strait. The wetlands are bordered by low-lying hills covered with grasses and with dark green trees growing on the crests of the hills. A waterbird sanctuary (Waterbird Regional Preserve) is within the wetlands. There is a contrast between the natural and industrial environments in this area south of the toll plaza. The

natural wetland characteristics include the smooth water surface reflecting the diverse colors of the sky and low hills with grasses and trees at the edges of the wetlands to the east and south. In contrast, there are the highly industrial land uses to the east and west with large round storage tanks, tall stacks, and horizontal and vertical steel pipes like a web of hardware and steel.

In addition to the character of views beyond the highway, there are highway-related structures within I-680. They include views of four to six travel lanes of northbound highway and shoulders and three to six travel lanes of southbound highway and shoulders separated by a concrete median barrier, all forming a linear plane of gray concrete at ground level in the center view. Barriers and metal-beam guard rails are at the highway's outside edges. At the I-680/SR-24 Interchange are flyovers, bridges, ramps, elevated BART tracks, concrete columns, and many retaining walls. Soundwalls exist between the highway and adjacent residential land uses, except at the new residential community between I-680 and Pacheco Boulevard in Martinez and a small section of mixed residential and commercial land uses in Pleasant Hill on the west side of the highway. There are approximately 6.11 miles of soundwalls in the northbound direction and 9.39 miles in the southbound direction.

Highway lights, overhead signs, sign bridges, and signs on posts are on the outer edges of the highway and on highway on-ramps and off-ramps. In the medians are existing Variable Toll Message Signs (VTMS), FasTrak Only signs, small "do not cross double line" signs, toll readers on gantries, and lights. The overhead signs add forms and texture to views of the horizon with their rectangular shapes, poles, steel truss gantries, and arched sign supports. In general, highway features above the ground plane are commonly visible.

At night, illuminated areas on the highway are visible by motorists travelling on the highway and local roads and by neighbors adjacent to the highway. Single- and multi-family residences located on the hillsides to the west and east of I-680 see light and glare in their views of the highway. For the majority of residents, views are screened by vegetation. Light sources in the highway are vehicle lights and luminaires at on-ramps and off-ramps, as noted above.

Key Views

Seven key views within the VAU described above were identified in the VIA. The key view locations are described below and identified in Figure 2.1.9-1.

- View 1: Vantage point on Sunnybrook Road west of I-680 (PM R11.79; approximate sign location). The view looking east from local road serving a residential neighborhood illustrates the existing conditions and a potential new VTMS in the I-680 median, facing northbound lanes.

- View 2: Vantage point on Clover Lane, south of the SR-24/I-680 Interchange (PM14.14; approximately adjacent to vantage point). View looking north from local road serving a residential neighborhood illustrates the existing

conditions and proposed Southbound I-680 realignment, the Southbound I-680 to Olympic Boulevard Connector, and widening of the Eastbound SR-24/Southbound I-680 Connector.

- View 3: Vantage point on Parkside Drive west of I-680 (PM R15.16; approximate sign location). The view looking east from local road serving a residential neighborhood illustrates the existing conditions and the proposed addition of two VTMS in the I-680 median; one facing northbound lanes and one facing southbound lanes.

- View 4: Vantage point on Northbound I-680 (PM 15.96; approximate sign location). The view looking north from I-680 illustrates existing conditions and the proposed addition of one VTMS in the I-680 median facing northbound lanes. The view illustrates the proposed widening of I-680 to the east to accommodate a dedicated northbound off-ramp to the North Main Street and Treat Boulevard Interchanges, and the addition of a soundwall (Evaluated Barrier 2) at the east edge of the off-ramp.

- View 5: Vantage point on Jones Road east of I-680 (PM15.95; approximately adjacent to vantage point). View looking southwest from local road serving a residential neighborhood illustrates existing conditions and the potential addition of a soundwall between the existing BART tracks and I-680. The view is on a local street to the east of the soundwall described in View 4 (Evaluated Barrier 2).

- View 6: Vantage point on Sherman Drive east of I-680 (PM R18.19; approximately adjacent to vantage point). View looking north from a local road east of I-680 illustrates the proposed addition of a soundwall approximately 5 feet to the east of an existing soundwall that would be removed and replaced.

- View 7: Vantage point on Iron Horse Regional Trail east of I-680 (PM R18.63; approximately adjacent to vantage point). View looking south from a regional recreation trail illustrates the proposed widening of I-680 to the east and the addition of a soundwall approximately 10 feet closer to Iron Horse Regional Trail than the existing soundwall.

2.1.9.3 Environmental Consequences

No-Build Alternative

The No-Build Alternative would maintain the current configurations of I-680 in the Visual Resources Study Area. Under the No-Build Alternative, the proposed Project would not be constructed, and no visual or aesthetics impacts would occur.

Build Alternatives (Alternatives 1C, 2, 3, and 5)

As previously defined in Section 2.1.9.2, *Affected Environment*, visual impacts are determined by assessing changes to the visual resources and predicting viewer responses to those changes. This section compares the visual quality of the existing resources with the projected visual quality after the Project is constructed and evaluates predicted viewer response to the resource changes as a result of the Project. The resulting level of visual impact is determined by combining the severity of resource change with the degree to which people are likely to oppose the change. Visual impacts can be beneficial or detrimental.

Figure 2.1.9-2 shows a generalized graphic developed by FHWA of the VIA process. Seven key view locations have been identified to represent the visual and aesthetic character of the area within the Project Study Limits, as identified previously in Figure 2.1.9-1.

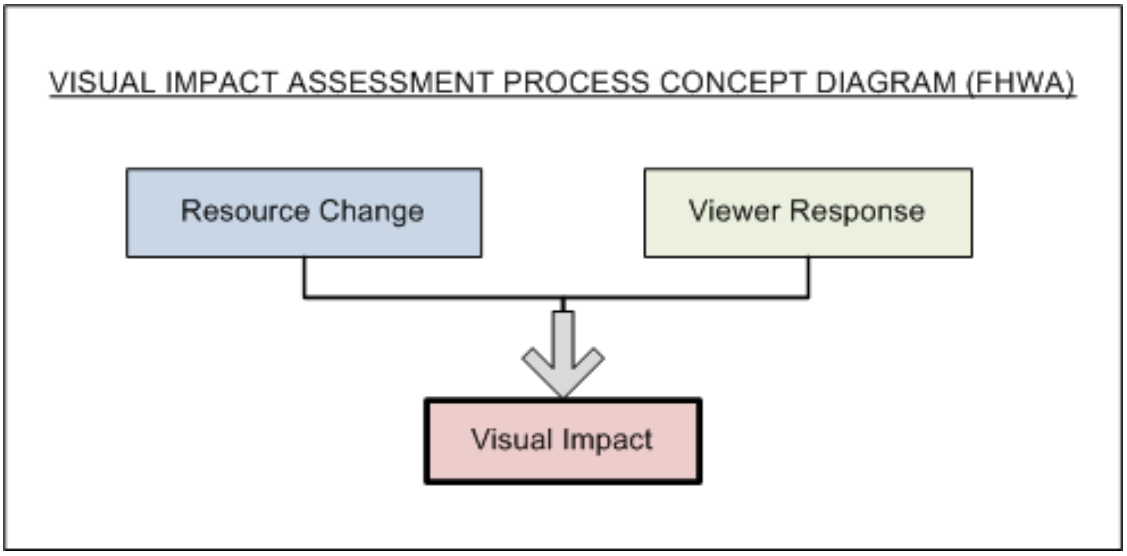


Figure 2.1.9-2. Visual Impact Assessment Process

KEY VIEW 1: View East of I-680, Sunnybrook Road, Alamo Vantage Point

Key View 1 is a vantage point on Sunnybrook Road looking east toward I-680. The view, which looks east from a local road that serves a residential neighborhood, was selected as a key view because it would illustrate the addition of one VTMS in the I-680 median facing northbound lanes.

Sunnybrook Road is a two-lane local road that connects with Danville Boulevard in Alamo and serves a densely populated, single-family residential community to the west of I-680. Danville Boulevard connects with Livorna Road approximately 0.39 mile to the south. The I-680/Livorna Road Interchange is 0.23 mile to the east of the intersection of Danville Boulevard and Livorna Road. The landscape is flat terrain in a narrow valley between the scenic Mount Diablo foothills to the east and the Trampas Ridge foothills to the west. SR-24 is to the north, and I-580 is to the south. From the vantage point the

foothills to the east of I-680 are visible beyond the soundwall. San Ramon Creek is to the east of the residential property line fence at the base of the highway embankment. The highway soundwall, two retaining walls on a grassy highway embankment slope, and a yellow diamond-shaped lane-merge sign mounted on the soundwall are visible to the east of the residence. There are no overhead highway signs or lights in the existing view. At the end of the Sunnybrook Road cul-de-sac is a concrete barrier and a chain link fence. The paved road is visible in the foreground. A utility pole, guy wire, and overhead utility lines are visible to the left and behind the vantage point. Within individual properties there is dense vegetation consisting of trees and shrubs that screen views of I-680 with varying degrees of density and screening.

The view's memorability (vividness) is moderate. The level of intactness is moderately low. The soundwall, retaining walls, highway sign, concrete barrier, chain link fencing, utility pole and guy wire, and overhead utility lines encroach on views of the natural environment. The level of unity, the balance between elements in the natural environment and structures in the view, is moderate. The visual quality in the existing condition for Key View 1 is moderate.

The existing condition for Key View 1 is illustrated in Figure 2.1.9-3. The proposed view for Key View 1 under all Build Alternatives is shown in Figure 2.1.9-4.



Figure 2.1.9-3. Key View 1 Photograph of Existing Conditions (July 6, 2021)



Figure 2.1.9-4. Key View 1 Proposed Condition – All Build Alternatives

Resource Change

The proposed Project, under all Build Alternatives, would add one northbound-facing VTMS and overhead light in the I-680 median at approximately PM R11.7. The total height of the VTMS sign structure plus light fixture would be approximately 44 feet above the highway pavement level. The approximately 13-foot-high by 29-foot-long sign plate would be mounted on a tubular gantry over the northbound travel lanes. The electronic message sign would display the toll pricing for the express lane system. The prices displayed would change depending on the level of congestion on the highway. The surface finish on the face of the sign would have reflective properties, enhanced by headlights of on-coming vehicles shining on the surface. The sign would be visible from single-family residences at the Sunnybrook Road cul-de-sac. The vividness or memorability of Key View 1 looking east toward I-680 and the foothills beyond would be diminished from the existing level of moderate to moderately low with the addition of the VTMS and overhead light. The structures added to the view and the light and glare would diminish the quality of the view. The intactness of the view would be diminished from the existing of moderately low to low with the addition of the light and glare in the view. The level of unity or balance between the natural environment and structures would remain moderate with the addition of the sign and light.

Viewer Response

The memorability of the view would decrease from the existing moderate to moderately low under the Build Alternatives. As discussed above, the resource change for Key

View 1 would be moderate. It is anticipated that the viewer response from neighbors within Key View 1 would be moderately high.

KEY VIEW 2: View North of I-680, Clover Lane, Walnut Creek Vantage Point

Key View 2 is at a vantage point on Clover Lane looking north toward the Southbound I-680 to Olympic Boulevard Connector Ramp. This view, which looks north from a local road that serves a residential neighborhood, was selected as a key view because it would illustrate the proposed realignment of Southbound I-680, the Southbound I-680 to Olympic Boulevard Connector, and widening of the Eastbound SR-24/Southbound I-680 Connector.

A masonry soundwall on an earth embankment is on the south side of the Eastbound SR-24 to Southbound I-680 Connector Ramp. Clover Lane is a two-lane local road serving a densely populated, single-family residential community to the southwest of the interchange. Clover Lane intersects Nicholson Road to the north in the view. With the exception of the view of highway structures from the vantage point, a dense grove of redwood and pine trees to the southeast and southwest of the soundwall partially screen views of the highway. The south side of SR-24 in this location is a Classified Landscaped Freeway and is also within the segment of SR-24 that is an Officially Designated State Scenic Highway. Within individual properties there is dense vegetation consisting of trees and shrubs that partially screen views of I-680 and SR-24. Utility poles and lines are on the west edge of Clover Lane. A chain link fence at the north edge of Nicholson Road and roadway pavement are also structures visible in the view.

The view's memorability (vividness) is moderate. The level of intactness is moderately low. The level of unity, the balance between elements in the natural environment and structures in the view, is moderate. The overall level of quality in the existing condition is moderate. The existing condition for Key View 2 is illustrated in Figure 2.1.9-5. The proposed view for Key View 2 under Alternatives 1C and 3 are shown in Figure 2.1.9-6. Alternatives 2 and 5 would not include any visual improvements at this location.

Resource Change

With Alternatives 1C and 3 the Eastbound SR-24 to Southbound I-680 Connector Ramp would be shifted approximately 40 feet to the south toward Clover Lane. The Southbound Olympic Boulevard off-ramp would also shift approximately 40 feet to the south and closer to residents. The existing soundwall would be removed. A new, up to 14-foot tall soundwall on top of a maximum 14-foot-tall retaining wall (24-RW2) would be added along the outside shoulder of the Eastbound 24/Southbound I-680 Connector Ramp and would be visible to single-family residents on Clover Lane and Nicholson Road. The combined total maximum height of the soundwall plus retaining wall would be approximately 26 to 28 feet. The existing trees would be removed. The vividness of the view would be diminished to moderately low, intactness would be low, and unity would be moderate. The overall quality of the view would be moderately low.

With Alternatives 2 and 5, the existing Eastbound SR-24/Southbound 680 Connector Ramp and the Southbound I-680 off-ramp to Olympic Boulevard would remain unchanged. The existing soundwall and trees would remain. No resource changes would occur under Alternatives 2 and 5 at Key View 2.

Viewer Response

The overall viewer response with Alternatives 1C and 3 would be moderately high. Resource change would be moderate. No changes would occur under Alternatives 2 and 5; therefore, viewer response for these alternatives within this Key View location would be unchanged.



Figure 2.1.9-5. Key View 2 Photograph of Existing Conditions (July 6, 2021)



Figure 2.1.9-6. Key View 2 Proposed Condition – Alternatives 1C and 3

KEY VIEW 3: View East of I-680, Parkside Drive, Walnut Creek Vantage Point

Key View 3 is a vantage point on Parkside Drive west of I-680. The view, which looks east from a local road serving a residential neighborhood, was selected as a key view because it would illustrate the proposed addition of two VTMS in the I-680 median; one facing northbound lanes and one facing southbound lanes.

Parkside Drive is a two-lane, local road that serves a densely populated single- and multi-family residential community west of I-680. Parkside Drive goes under I-680 and connects with North Main Street to the north and with Hillside Avenue to the south. The existing retaining wall and soundwall block views to scenic Mount Diablo and ridges to the east. Paved roadway is visible in the foreground. Utility poles and overhead utility lines are visible on both sides of the road. Within individual properties there is vegetation consisting of trees and shrubs that screen views of I-680, the soundwall, and the retaining wall with varying levels of density and screening.

Therefore, the view's memorability (vividness) is moderately low, and the level of intactness is low. The soundwall, retaining wall, utility poles, and overhead utility lines encroach on views of the natural environment. The level of unity, the balance between elements in the natural environment and structures in the view, is moderate. The overall level of quality in the existing condition is moderately low. The existing condition for Key View 3 is illustrated in Figure 2.1.9-7. The proposed view for Key View 3 under Alternatives 1C and 3 is shown in Figure 2.1.9-8. Alternatives 2 and 5 would not add a VTMS at this location.

Resource Change

Build Alternatives 1C and 3 would add one northbound-facing and one southbound-facing VTMS and overhead lights on separate arched posts in the I-680 median at approximately PM 15.16. The total height of the VTMS sign structures plus light fixtures would be approximately 44 feet above the highway pavement level. Each 13-foot-high by 29-foot-long sign plate would be mounted on a truss or separate round tube posts with arched mast arms over the northbound and southbound travel lanes (Figure 2.1.9-8).[a] The electronic message sign would display the toll pricing for the express lane system. The prices displayed would change depending on the level of congestion on the highway. The surface finish on the face of the sign would have reflective properties, enhanced by headlights of on-coming vehicles shining on the surface. The northbound-facing sign face would be visible from single- and multi-family residences at Parkside Drive.



Figure 2.1.9-7. Key View 3 Photograph of Existing Conditions (July 6, 2021)

[a] Although Figure 2.1.9-8 depicts the VTMS on a tube post, recent designs show that a truss would be required at this location because the width of the existing median could not accommodate a tubular post.



Figure 2.1.9-8. Key View 3 Proposed Condition – Alternatives 1C and 3

Under Alternatives 2 and 5, there would be no VTMSs in the approximate location near Key View 3. Alternatives 2 and 5 would add a FasTrak Only sign and a Begin Express Lane Sign facing northbound lanes, mounted on a truss. At the east edge of the highway, the Project would add a Weigh Station Ahead Sign facing northbound lanes. The support structure would be an arched, truss or tube post and mast arm. No lighted, changeable toll messages or overhead lights above the sign, which would add light and glare to views of the horizon, are anticipated as a part of Alternatives 2 and 5 within this Key View.

Under the Build Alternatives, Key View 3's memorability (vividness) looking east toward I-680 would not be diminished from the existing level of moderately low with the addition of the signs and overhead lights. The intactness of the view is already low and would be diminished to a greater extent with the addition of the structures, light, and glare in the view. The level of unity or balance between the natural environment and structures would remain moderate with the addition of the signs and light.

Viewer Response

With Alternatives 1C and 3, the overall viewer response would be moderately high, resource change would be moderate, and visual impacts would be moderately high. With Alternatives 2 and 5, the overall viewer response would be moderate, resource change would be moderately low, and visual impacts would be moderate.

KEY VIEW 4: View North of I-680, I-680 Northbound Travel Lanes, Walnut Creek Vantage Point

Key View 4 is a view of a vantage point on Northbound I-680. The view looking north from I-680 was selected as a key view because it would illustrate the addition of one VTMS in the I-680 median facing northbound lanes. The view would also illustrate the widening of I-680 to the east to accommodate a dedicated northbound off-ramp to the North Main Street and Treat Boulevard Interchanges and the addition of a soundwall at the east edge of the off-ramp.

The view, looking north, includes five paved travel lanes and shoulders, vehicles, a concrete median barrier, highway light, a VTMS in the median facing southbound lanes, overhead mileage signs at the east and west edges of the highway, and a metal beam guard rail at the edge of the northbound shoulder. High-rise commercial buildings are visible in the distance to the north. Features visible in the natural environment include dense vegetation to the east, moderately dense vegetation to the west, and views of the horizon.

The view's memorability (vividness) is moderate. The level of intactness is low. Highway structures and views of vehicles encroach on views of the natural environment. There is a moderate level of unity balance between the natural and constructed environments. The overall level of quality in the existing condition is moderately low. The existing condition for Key View 4 is illustrated in Figure 2.1.9-9. The proposed view for Key View 4 under Alternatives 2, 3, and 5 is shown in Figure 2.1.9-10.



Figure 2.1.9-9. Key View 4 Photograph of Existing Conditions (July 6, 2021)



Figure 2.1.9-10. Key View 4 Proposed Condition – Alternatives 2, 3, and 5

Resource Change

Alternatives 2, 3, and 5 would remove the existing metal beam guardrail and vegetation east of the highway. A two-lane, plus shoulders, Treat Boulevard Northbound off-ramp would be added to the view between the North Main Street and Treat Boulevard Interchanges. A concrete barrier would be added between the off-ramp and I-680 northbound lanes. A maximum 14-foot-high soundwall would be added on a proposed retaining wall that would be approximately 1,775 feet long by 30 feet high (5 feet would be below grade). The soundwall would be visible at the edge of the highway from I-680 northbound lanes, however, the retaining wall would not be visible. The existing vegetation that would be removed is within a Classified Landscaped Freeway segment of highway. Another highway feature that would be included under Alternatives 2, 3, and 5 would be a VTMS and overhead light in the median facing northbound lanes next to the existing VTMS facing southbound lanes in the view. The existing overhead truck scales sign on the arched mast arm at the east edge of the highway would be relocated to a position further to the south and mounted on the concrete barrier at the west edge of the connector.

View 4's memorability (vividness) would be diminished from the existing level of moderate to a low level of quality with the removal of the existing dense vegetation at the east edge of the highway, addition of the two-lane Treat Boulevard Northbound off-ramp, the addition of a soundwall at the east edge of the off-ramp, and a concrete barrier between the I-680 northbound lanes and the proposed off-ramp. The addition of the VTMS in the median would not diminish the existing quality of the I-680 median's views since an existing VTMS is present in the same location. The existing low level of

intactness in the view would be diminished to a lower level of low with the addition of the off-ramp structures encroaching on views of the natural environment. The existing moderate level of unity in the balance between man-built structures and natural features would be reduced to a low level of quality with the addition of the off-ramp and its structures. Alternatives 2, 3, and 5 would remove the vegetation on the east side of the highway that contributes to the existing balance between natural and structural features in the view.

With Alternative 1C, the braided ramps between North Main Street and Treat Boulevard Interchanges would not be constructed. Instead, the Lawrence Way to Northbound I-680 on-ramp would be widened approximately 12 feet to the east between I-680 PM 15.77 to PM 15.90. Beginning at PM 15.90, the east edge of the highway would taper back toward the west and conform to the existing east edge of the highway at approximately PM 16.35. A maximum 14-foot-high soundwall and a concrete barrier would be added to the east edge of the highway. With the widening, a retaining wall would be added that extends below grade under the soundwall and concrete barrier. Similar to Alternatives 2 and 3, existing trees and vegetation would be removed with Alternative 1C. For trees and vegetation that are disturbed by construction, highway planting would be added under a follow-on contract and in accordance with Caltrans' policy for highway planting. A VTMS would be added in the same location in the median as described above for Alternatives 2, 3, and 5. With Alternative 1C, vividness would be moderately low, intactness would be low, and unity would be moderate.

Viewer Response

As the resource change for Key View 4 is anticipated to be high, it is anticipated that the overall viewer response under the Build Alternatives would be high.

KEY VIEW 5: View West of I-680, Jones Road, Walnut Creek Vantage Point

Key View 5 is a view of a vantage point on Jones Road east of I-680. This view, which looks southwest from a local road that serves a residential neighborhood, was selected as a key view because it would illustrate the addition of a soundwall between the existing BART tracks and I-680. The view is on a local street to the east of the soundwall described in Key View 4.

Jonas Road is a two-lane local road that serves a densely populated single- and multi-family residential community east of I-680. Jones Road connects with Parkside Drive to the south, and with Treat Boulevard to the north. BART tracks, passenger train, and chain link fencing are visible to the west. Also visible are vehicular pavement, curb, sidewalk, and vehicles in Jones Road. Utility poles and lines are along the east edge of the road behind the sidewalk. Dense vegetation screens views to the west of I-680. The natural environment also includes dense groves of mature street trees and vegetation within individual properties.

The memorability (vividness) of the view is high. The level of intactness is moderate. There is a harmonious balance between structures and natural features; therefore, the

level of unity is high. The overall level of quality in the existing condition is moderately high. The existing condition for Key View 5 is illustrated in Figure 2.1.9-11. The proposed view for Key View 5 under the Build Alternatives is shown in Figure 2.1.9-12.

Alternative 1C

Alternative 1C would widen I-680 approximately 12 feet to the east in the location of the view, and a barrier with soundwall would be added along the east edge of the shoulder. For vegetation that is disturbed by the highway widening, highway planting would be added under a follow-on contract and in accordance with Caltrans' policy for highway planting. Vividness would be moderately high, intactness would be moderate, and unity would be high.

Alternatives 2, 3, and 5

Alternatives 2, 3, and 5 would remove the existing screening vegetation between the BART tracks and the east edge of I-680. A maximum 14-foot-high soundwall (Evaluated Barrier 2) would be added on a proposed retaining wall (NMT RW 4) that would be approximately 1,775 feet long by 3 feet high. Approximately 5 feet of the retaining wall would be below grade, and the first 5 feet above grade would be hidden by the earth mound that supports the BART tracks. The existing planting between the chain link fence next to Jones Road and the BART tracks would remain and would provide partial screening of the proposed soundwall and retaining wall.



Figure 2.1.9-11. Key View 5 Photograph of Existing Conditions (July 6, 2021)



Figure 2.1.9-12. Key View 5 Proposed Condition – Alternatives 2, 3, and 5

Resource Change

Key View 5's memorability (vividness) would be diminished from the existing high to moderately high under Alternatives 2, 3, and 5 with the removal of the dense planting at the east edge of I-680 and the addition of the soundwall and retaining wall. The moderate level of intactness in the existing view would remain moderate, although intactness would be diminished somewhat by the intrusion of the walls on the natural environment. However, the remaining planting between the BART tracks and Jones Road would partially screen the walls. The balance between the natural environment and structures would remain high due to the remaining screening vegetation at the west edge of Jones Road. Vines planted in front of the walls and shrubs between the BART tracks and Jones Road would be added under a follow-on contract and in accordance with Caltrans' policy for highway planting.

Viewer Response

The overall viewer response for Alternative 1C would be moderately low. Resource change would be moderately low under Alternative 1C. The overall viewer response would be moderate for Alternatives 2, 3, and 5. Resource change would be moderate for Alternatives 2, 3, and 5.

KEY VIEW 6: View North of I-680, Sherman Drive, Concord Vantage Point

Key View 6 is a view of a vantage point on Sherman Drive east of I-680. This view, which looks north from a local road east of I-680, was selected as a key view because it

would illustrate the proposed addition of a proposed soundwall (SW No. 3) approximately 5 feet east of an existing soundwall (Existing Barrier E.3) that would be removed.

Sherman Drive is a two-lane local road that serves a densely populated single-family residential community east of I-680. Sherman Drive connects with Ramona Drive and Monument Boulevard to the south, and with Cleopatra Drive to the north behind the vantage point. Sherman Drive ends in a cul-de-sac at the north end of the view. An existing soundwall on a retaining wall is visible to the west. Also visible are vehicular pavement, rolled curb and gutter, and vehicles in Sherman Drive. Utility poles and lines are along the west edge of the road, with lines crossing to the single-family residences to the east. Street trees and shrubs next to the wall partially screen it. Dense groves of mature trees and vegetation are within individual properties.

The view's memorability (vividness) is moderate. The level of intactness is moderate. There is a harmonious balance between structures and natural features. The level of unity is moderately high. The overall level of quality in the existing condition is moderate. The existing condition for Key View 6 is illustrated in Figure 2.1.9-13. The proposed view for Key View 6 under Alternatives 1C, 2, and 3 (with planting) is shown in Figure 2.1.9-14. Alternative 5 would not include any highway widening or replacement of the existing soundwall at this location.



Figure 2.1.9-13. Key View 6 Photograph of Existing Conditions (July 6, 2021)



Source: Haygood & Associates 3-2022

Figure 2.1.9-14. Key View 6 Proposed Condition – Alternatives 1C, 2, and 3 with Planting

Resource Change

Alternatives 1C, 2, and 3 would remove the existing soundwall and retaining wall between the intersection with Cleopatra Drive and the linear park to the north, ending at approximately PM R18.19. A new soundwall and retaining wall with the same concrete surface texture as the existing walls would be added approximately 5 feet east of the existing wall location in the view (Figure 2.1.9-14). The existing trees and shrubs between the wall and the road would be removed. Vines and trees between the wall and Sherman Drive would be added under a follow-on contract and in accordance with Caltrans' policy for highway planting. View 6's memorability (vividness) would be diminished somewhat until the highway planting is added. Overall, the level of vividness would remain moderate. Intactness and unity would remain moderate with the addition of the highway planting.

Viewer Response

The overall viewer response would be moderate under Alternatives 1C, 2, and 3.

KEY VIEW 7: View South of Linear Open Space and I-680 Soundwall, Iron Horse Regional Trail, Concord Vantage Point

Key View 7 is a view of a vantage point on the Iron Horse Regional Trail east of I-680. This view, which looks south from the regional recreation trail, was selected as a key

view because it would illustrate the proposed widening of I-680 to the east and the proposed addition of a soundwall approximately 10 feet closer to the trail than the existing soundwall.

At this location, the Iron Horse Regional Trail is within an approximately 332-foot-wide linear open space and a riparian corridor for Walnut Creek. Mount Diablo is visible to the east, and foothills are visible to the east and south. Groves of trees, shrubs, and grassy slopes are visible within the linear trail. To the east of the trail is a single-family residential community. To the west is an existing soundwall, I-680, and the I-680/SR-242 Interchange. Mounted on the soundwall are highway lights, videocam and sign bridge post, and a mast arm. Chain link fences are present on both sides of the paved trail.

The view's memorability (vividness) is high. The soundwall, highway lights and poles, chain link fences, and trail pavement intrude on views of the natural environment, diminishing the level of intactness to moderate. There is a harmonious balance between structures and natural features. The level of unity is high. The overall level of quality in the existing condition is moderately high.

The existing condition for Key View 7 is illustrated in Figure 2.1.9-15. The proposed view for Key View 7 under Alternatives 1C, 2, and 3 is shown in Figure 2.1.9-16. Alternative 5 would not include any highway widening or replacement of the existing soundwall at this location.



Figure 2.1.9-15. Key View 7 Photograph of Existing Conditions (July 6, 2021)



Figure 2.1.9-16. Key View 7 Proposed Condition – Alternatives 1C, 2, and 3[b]

Resource Change

Alternatives 1C, 2, and 3 would remove the existing soundwall and chain link fence to the west of the trail. A new soundwall on a concrete barrier with the same concrete surface texture as the existing wall would be added approximately 10 feet east of the existing wall location in the view. A chain link fence would be added in the same location as the existing fence. Existing vegetation within State ROW, adjacent to the soundwall would be removed. Trees and grass between the wall and the chain link fence would be added under a follow-on contract, in accordance with Caltrans' policy for highway planting.

Key View 7's memorability (vividness) in general would remain high because of the scenic views of Mount Diablo and foothills and views to the east of the riparian corridor. Intactness would be diminished to moderately low, and unity would be diminished to moderate with the addition of the proposed soundwall in a location closer to the trail.

[b] Although the simulation shows the vegetation (trees) to the right (west) of the trail being removed, these trees are outside Caltrans ROW and would remain.

Viewer Response

The overall viewer response would be moderately high for Alternatives 1C, 2, and 3. No changes would occur under Alternative 5; therefore, viewer response within this Key View location would be unchanged.

Temporary Impacts

Temporary visual impacts are anticipated during the 2-year construction period under all Build Alternatives. Temporary visual impacts would include the presence of construction equipment and materials, construction staging areas, temporary roadside barriers, and construction and detour signage within the area of the Project Study Limits, as well as construction activities, such as truck hauling, excavation activity, and the removal of existing mature plantings.

Project construction is anticipated to take up to 2 years to complete and would have a disturbed surface area (DSA) of up to 37.2 acres under Alternative 3. As described further in Section 2.3.1, *Natural Communities*, this DSA would include 3.49 acres of vegetated land. In addition, up to 309 trees would potentially need to be removed under Alternative 3. Alternatives 1C, 2, and 5 would result in less DSA and less overall tree removal than Alternative 3. Vegetation removal and a landscape plan, outlined in Measures **VIS-1** and **VIS-2**, respectively, would avoid or minimize visual impacts as a result of vegetation removal during construction.

Visual quality within the highway corridor is expected to degrade due to vegetation removal for construction, storage of construction equipment, and construction activities. Viewers would see materials, equipment, workers, and construction operations, including trenching, excavations, dust, placement of temporary roadside barriers, construction signage, night lighting, contractor yards, temporary construction access roads, new pavement, and new structures being constructed. Construction impacts are unavoidable and temporary. Motorists, bicyclists, and pedestrians would be exposed to construction activities while passing through the construction zone. Residents of adjacent homes would be exposed to construction activities on a more continuous basis. **VIS-3** would be implemented, which would shield stored construction vehicles, equipment, and stockpiled materials using visual screens or topography, when feasible, to lessen the visual impact of construction on highway neighbors and users.

The Project Study limits receive light at night from traffic, street lighting, traffic signals, freeway on-ramps and off-ramps, and the surrounding commercial businesses. Measure **VIS-4** would be implemented, which would minimize potential impacts related to light and glare. With implementation of Measures **VIS-1** through **VIS-4**, temporary impacts would be minimized and the proposed Project, under all Build Alternatives, would not result in substantial temporary direct or indirect impacts on visual quality.

Permanent Impacts

All Build Alternatives propose new ramps, express lane, soundwalls and retaining walls, lighting, overhead signage, and road widening. Overall, the Project, under all Build

Alternatives, is moderately compatible with the character of the existing conditions. There are existing express lane signs, lights, express lane striping, toll gantries, utility cabinets and California Highway Patrol (CHP) pull-outs in I-680 within the Project Study Limits. Alternative 2 at the I-680/SR-24 Interchange would result in a moderately high level of compatibility with the existing character of the corridor with moderate to moderately low-level visual impacts. All Build Alternatives would result in a low level of compatibility with the existing character of the corridor between the North Main Street and Treat Boulevard Interchanges. In addition, Alternatives 1C and 3 would result in a low level of compatibility with the existing character of the corridor at the I 680/SR24 Interchange. Both areas would result in moderately high to high level visual impacts on motorists and highway neighbors in residential communities.

All Build Alternatives would require removal of highway planting. Remaining vegetation beyond the limits of removal would continue to screen the highway from neighboring vantage points and would continue to provide motorists with views of the natural environment. This condition would occur at the Sugar Loaf Open Space Preserve between Livorna Road and Rudgear Road. There are trees and grassy slopes beyond those that would be removed by the highway widening to the east in Alternatives 1C, 2, and 3. Vegetation would also be removed along the Northbound Rudgear Road on-ramp under Alternatives 1C, 2, and 3, but screening trees and shrubs would remain. The remaining vegetation would screen views of the highway from vantage points to the east of the ramp. Unlike Alternatives 1C, 2, and 3, Alternative 5 would not widen the Rudgear Road Undercrossing Bridge.

I-680 is an Officially Designated State Scenic Highway between SR-24 in Walnut Creek and Mission Boulevard in Fremont. Under all Build Alternatives, the Project would not directly impact distant scenic resources, such as mountains and ridges, but would directly affect vegetation adjacent to the highway, including mature trees, shrubs and grassy slopes, permanently altering the view within the Officially Designated State Scenic Highway as well as within the Classified Landscaped Freeway sections of I-680.

The Project would affect views of scenic vistas. Motorists on I-680 would see Project signs overlapping views of Mount Diablo and foothills, and ridges to the south. Depending on travel speeds and the duration of exposure to the signs, overall viewer response would vary from moderate to moderately high. Visual impacts would be moderate to moderately high with regard to scenic vistas.

As previously discussed, the Project, under all Build Alternatives, would implement Measures **VIS-1** and **VIS-2** to minimize and avoid impacts to vegetation and landscaping within the Project Study Limits. Additionally, as described in Section 1.4.1.6, *Standardized Project Measures*, the Project would prepare and implement a highway planting plan that would require replacement planting along I-680 with a 3-year establishment period.

Mature trees at the edges of the highway are regarded highly by and necessary to highway neighbors who rely on trees to screen their views of the highway, soundwalls, and retaining walls. Some of the trees that would be removed by the Project, especially

at Nicholson Road, Clover Lane, and Sherman Drive in Walnut Creek would impact neighbors. On Clover Lane, for example, which is adjacent to the southwest quadrant of the I-680/SR-24 Interchange, Alternatives 1C and 3 would shift Southbound I-680, the Southbound I-680 to Olympic Boulevard off-ramp, and the Eastbound SR-24 to Southbound I-680 Ramp to the west requiring removal of screening trees. The remaining land between Nicholson Road and the proposed soundwall/retaining wall at the south edge of the SR-24 to I-680 Ramp would be restricted and not wide enough to restore screening trees in this area. Overall viewer response would be moderately high, resource change would be moderate, and visual impacts would be moderately high with views of the proposed highway structures and removal of screening trees.

Mature trees at the edges of the highway are also natural resources that are highly regarded by motorists. Trees and shrubs provide views of natural diversity in the environment in form, line, texture, and color as well as responding to seasonal changes and wind currents. There are proposed Project features that would result in permanent removal of trees. For example, this would occur along the Northbound Treat Boulevard off-ramp on I-680 between the North Main Street and Treat Boulevard Interchanges under Alternatives 2, 3 and 5. The condition is assessed in Key View 4 from the motorists' vantage point on Northbound I-680. The off-ramp would be added to the east of I-680 between the existing edge of the highway and the BART tracks. This segment of highway is densely planted with trees and shrubs. The vegetation would be removed and replaced by pavement and a soundwall along the east shoulder of the off-ramp. Similar to Alternatives 2 and 3, existing trees and vegetation would be removed and a soundwall added with Alternative 1C that would widen the highway to the east to accommodate the Lawrence Way on-ramp. Screening trees and vegetation would be removed and not replaced in restricted areas between the edges of the highway and proposed soundwalls and retaining walls. Grassy slopes at the edge of the highway would be replaced with retaining walls at cut slopes where highway widening is proposed. Tree replacement and vegetation replacement ratios would be required for specific species that are removed, as discussed in Section 2.3.1, *Natural Communities*.

The Build Alternatives would result in the construction of sound walls and retaining walls up to 14 feet and 25 feet, respectively. Retaining walls exceeding the height of sound walls are expected to be placed at a lower elevation so the highway user would not view a wall over 14 feet tall. Under the Build Alternatives, Measure **VIS-5** would be implemented, which would require the consideration of aesthetic treatments to hardscapes that are consistent with aesthetic treatments present in the surrounding area.

The Project would add light and glare to the existing environment. Highway lights, illuminated signs, and signs with reflective surfaces would affect residents in neighborhoods adjacent to the highway with direct views of a sign's surface and lighted messages. Visual impacts from highway signs to those affected residents would be moderately high to high. The Project has been designed to avoid adding permanent lighting adjacent to the McNabney Marsh. Visual impacts from the light and glare of highway lights to residential neighbors would vary from moderate to low depending on the level of exposure to the lights, and the level to which views of distant scenic

resources were diminished by the light and glare. As previously discussed, Measure **VIS-4** would be implemented, and a lighting plan to address light and glare impacts would be prepared.

Therefore, with the implementation of Measures **VIS-1** through **VIS-5**, and the Standardized Project Measures discussed above, no permanent indirect or direct adverse effects to visual quality and aesthetics would occur.

2.1.9.4 Summary

*Alternative 2 has been selected as the preferred alternative. I-680 is an Officially Designated State Scenic Highway between SR-24 in Walnut Creek and Mission Boulevard in Fremont. Sections of I-680 are also Classified Landscaped Freeway in Contra Costa County. Unlike Alternatives 1C and 3, Alternative 2 would not realign southbound I-680 at the SR-24 Interchange. Measures **VIS-1** through **VIS-5, BIO-GEN-10**, and **BIO-MM-1** and the Standardized Project Measures discussed above would be implemented. Alternative 2 would not adversely affect visual quality or aesthetics.*

2.1.9.5 Avoidance, Minimization, and/or Mitigation Measures

Caltrans and FHWA mandate that a qualitative/aesthetic approach should be taken to address visual quality loss in a project area. 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.

Tree replacement planting and revegetation measures described in Section 2.3.1, *Natural Communities*, including **BIO-GEN-10** and **BIO-MM-1**, would be implemented. In addition, the following avoidance and minimization measures would be implemented with concurrence by the District Landscape Architect:

VIS-1 **Vegetation Removal.** During construction, the construction contractor will minimize the removal of groundcover, shrubs, and mature trees to the maximum extent possible, and utilize unvegetated areas for contractor staging/storage areas, when feasible. The construction contract will protect vegetation outside the clearing and grubbing limits from the contractor's operations, equipment, and materials storage. High visibility temporary fencing will be placed around vegetation to be protected before roadway work begins. Regular watering of vegetation should be provided to vegetation when construction interrupts normal automated irrigation.

All disturbed areas will receive hydroseeded treatment of erosion control grasses, and if appropriate, locally native grasses. Any roadside vegetation and irrigation systems that are damaged or removed during project construction will be replaced according to Caltrans' policy.

When trenching for utilities, the construction contractor will avoid trenching within drip lines of trees and screening shrubs. Directional drilling that

would avoid damaging root systems of established plant material will be used, when reasonable, as opposed to open trenching to install new conduit in places where work within the drip line would be required. Trees and screening shrubs will be protected from damage during construction.

VIS-2 **Landscape Plan.** During the design phase, CCTA and Caltrans or designated contractors will prepare a highway landscape plan that will identify all opportunities to use areas within the state ROW for full landscaping consistent with the Caltrans Highway Design Manual. This will include planting for graded areas with plant species consistent with adjacent vegetation and enhancement of new Project structures such as ramps and tunnels to the extent feasible. This plan will incorporate all applicable procedures and requirement detailed in the Caltrans Highway Design Manual Chapter 900 – Landscape Architecture- Roadside (July 2020), consistent with the Classified Landscaped Freeway policies, and consistent with applicable city general plans or municipal codes, as applicable.

During the design phase, the Caltrans District 4 Landscape Architect will verify that the design minimizes removal of existing mature trees. If removal of mature trees cannot be avoided, additional landscape improvements will be incorporated into the final design for these areas, where feasible.

Highway planting within Caltrans right-of-way will be provided where feasible to screen residential views of proposed express lane signs and lights and other highway activity and infrastructure. Caltrans safety-setback requirements will apply for all plantings within State right-of-way.

During the design phase, Caltrans District 4 Landscape Architect will ensure that topography, visual screening, and adjacent development are considered in the placement of overhead signs, sign gantries, and sign lighting to minimize visual impacts on residents along the Project corridor. Locations of Project features may be adjusted where feasible given highway safety standards and other engineering and environmental considerations.

VIS-3 **Construction Shields.** During construction, the construction contractor will place unsightly materials, equipment storage, and staging so that they are not visible within the foreground of the highway corridor to the maximum extent feasible. Where such siting is unavoidable, material and equipment will be stored and visually screened to minimize visibility from the roadway and nearby sensitive off-road receptors.

VIS-4 **Lighting Plan.** During the design phase, CCTA and Caltrans will prepare a Lighting Plan and ensure that lighting fixtures be selected to minimize glare on adjacent properties and into the night sky. Lighting will be

shielded with non-glare hoods and focused within the Project ROW. The Lighting Plan will be reviewed and approved by Caltrans District 4 Landscape Architect prior to construction to ensure compliance with these criteria. Construction lighting will be limited to within the area of work and light trespass will be avoided through the use of directional lighting and shielding as needed.

VIS-5 **Aesthetic Treatments.** During the design phase, CCTA or designated contractors will work with Caltrans District 4 staff in order to verify that design elements are consistent with the vision for the Contra Costa County regarding aesthetic enhancements, scenic corridors, landscaping, and tree removal and plantings policies. During the design phase, the Project Development Team will evaluate the aesthetic enhancements to be incorporated into the constructed elements to the extent feasible, such as design and color treatment for the new overhead sign structures, gantries, VTMSs and light standards shall be similar to the existing adjacent structures and poles, so to be visually compatible and consistent with the existing installations along the corridor. Additionally, where feasible, new concrete safety barriers and retaining walls should match the aesthetics (color, pattern and/or texture) of the existing barriers/walls along corridor for visual consistency. Treatments of color, pattern and/or texture are required in order to reduce visual impacts, glare, and the possible incidence of graffiti. If needed, maintenance agreements will be established during the design phase. Where feasible, vines could be planted along soundwalls to reduce visual impacts, potential for glare, and reduce the incidence of graffiti. Reference *Contra Costa I-680 Comprehensive Multimodal Corridor Plan* for aesthetic and landscape guidelines.

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2.1.10 Cultural Resources

2.1.10.1 Regulatory Setting

The term "cultural resources," as used in this document, refers to the "built environment" (e.g., structures, bridges, railroads, water conveyance systems, etc.), places of traditional or cultural importance, and archaeological sites (both prehistoric and historic), regardless of significance. 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 include:

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 Code of Federal Regulations [CFR] 800). On January 1, 2014, the First Amended Programmatic Agreement (PA) among the Federal Highway Administration (FHWA), the ACHP, the California State Historic Preservation Officer (SHPO), and Caltrans went into effect for Department projects, both state and local, with FHWA involvement.[1] 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 United States Code [USC] 327).

The California Environmental Quality Act (CEQA) requires the consideration of cultural resources that are historical resources and tribal cultural resources, as well as "unique" archaeological resources. California Public Resources Code (PRC) Section 5024.1 established the California Register of Historical Resources (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

[1] The title of the PA is: *First Amended Programmatic Agreement Among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California Department of Transportation Regarding Compliance with Section 106 of the National Historic Preservation Act, as it pertains to the Administration of the Federal Aid Highway Program in 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. It further requires the Department to inventory state-owned structures in its rights-of-way (ROW). Sections 5024(f) and 5024.5 require state agencies to provide notice to and consult with the 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)[2] 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.

2.1.10.2 Affected Environment

The following discussion is derived from the proposed Project's *Historic Resources Evaluation Report*, (JRP Historical Consulting, 2023), which was completed in April 2023, and *Archaeological Survey Report and Extended Phase I Report*, (Far Western Anthropological Research Group, 2023), which was completed in August 2023.

Area of Potential Effects

The study area for cultural resources is the archaeological and architectural Area of Potential Effects (APE), which encompasses all areas within the physical footprint of the improvements proposed for the Build Alternatives as well as areas that may either be directly or indirectly affected by project construction activities. For this Project, the APE is 20.1 miles long and follows Caltrans ROW through most of the Project area, extending from post mile (PM) R4.4 to PM 24.5 on Interstate 680 (I-680). The APE is based on the prior Project Study Limits (Figure 1-10), which were reduced in October 2023. In the vicinity of the State Route (SR) 24 Interchange, the Project widens beyond State ROW in several areas to accommodate possible freeway widening elements. The vertical APE varies within the project APE, with excavation depths ranging from 1 foot for maintenance vehicle pullouts up to 75 feet for abutment and bent piles for bridge widenings.

[2] The MOU is located on the Caltrans State Environmental Reference at https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/5024mou-15-a11y.pdf. The title of the PRC 5024 MOU is *Memorandum of Understanding Between the California Department of Transportation and the California State Historic Preservation Officer Regarding Compliance With Public Resources Code Section 5024 and Governor's Executive Order W-26-92*.

Records and Archival Review

Far Western supported environmental studies previously for similar express lane projects that included the current Project corridor. The southern portion of the Project area was studied for the Bay Area Infrastructure Financing Authority's Interstate 680 Express Lane Phase I Project, as documented in Leach-Palm and Meyer (2014) and Meyer and Leach-Palm (2014). Whitaker and Kaijankoski conducted a study of the northern half of the Project corridor for the Interstate 680 Express Lanes Project (Southbound) in 2016 (Whitaker & Kaijankoski, 2016). Furthermore, DeBaker et al. (2015) conducted a study for the Backhaul Communications Network Project that included the entire Project footprint and Holson (2013) executed a study that extended 5.4 miles between Livorna and Geary Roads.

Building on previous studies, Far Western conducted an updated supplemental records search of materials on file with the Northwest Information Center (NWIC) of the California Historical Resources Information System at Sonoma State University, Rohnert Park, encompassing a 0.25-mile radius of the initial APE—extending from I-680 just south of Marina Vista Avenue in Martinez to Livorna Road in Walnut Creek. The study was requested on August 5, 2020, and NWIC responded on October 2, 2020. A supplemental records search was requested on May 3, 2021, to accommodate further design changes and add an additional 5 miles of Project area on the southern extension. NWIC provided the results of this request on June 14, 2021.

Basemaps were examined for archaeological sites and surveys within the research area, and the California Inventory of Historic Resources (1976 and updates) and the Office of Historic Preservation's Historic Property Data File were reviewed. Historical U.S. Geological Survey (USGS) topographic quadrangles were acquired online using USGS TopoView. General Land Office and Rancho plat maps were acquired from the Bureau of Land Management, Sacramento, and the following were examined:

- General Land Office plat maps (1865 and 1896)
- 1876 Thompson & West, Historical Atlas and Map of Santa Clara County
- 1881 Plat of the Rancho Pastoria de las Borregas, finally confirmed to Mariano Castro

The supplemental records search noted 106 previously recorded cultural resources within the 0.25-mile search area (Far Western Anthropological Research Group, 2023). Of these, 89 are built environment (e.g., railroads, water conveyance, buildings) and 17 are archaeological sites. The archaeological sites consist of two historic-era resources, 14 prehistoric sites, and one unknown site (no data on file).

Native American Consultation

A request for a search of the sacred lands file and a list of interested individuals was sent to the Native American Heritage Commission (NAHC) on August 3, 2020. NAHC

responded on August 18, 2020, with negative results for sacred lands in the vicinity of the APE and provided a list of 12 interested individuals. The Contra Costa Transportation Authority (CCTA), with the assistance of Far Western, contacted each of the representatives on the list. Letters were sent to individuals on August 31, 2020, with a second letter following on August 17, 2021. The latter detailed project changes and provided a new map set. A final email was sent to all interested party contacts on September 10, 2021, soliciting final comments on the Project prior to the completion of cultural studies. No responses were received regarding the initial notices.

In support of the Extended Phase I archaeological studies (described below), emails (with attached letters and maps) were sent to Native American tribes on April 12, 2023, and follow-up phone calls were conducted by the consultant archaeologist on May 12, 2023. CCTA conducted (in coordination with Caltrans) additional phone-calls and email correspondence later the same month. Representatives from the Amah Mutsun Tribal Band of Mission San Juan Bautista, The Confederated Villages of Lisjan, Indian Canyon Mutsun Band of Costanoan, and The Ohlone Indian Tribe responded to the Extended Phase I notification. CCTA reached out to these representatives, extending an invitation to participate in lab work for the Extended Phase I. A representative from the Indian Canyon Mutsun Band of Costanoan responded requesting further consultation on July 21, 2023. Consultation with Native American tribes is ongoing under both Section 106 and AB 52, which is described further in the Section 3.2.18 of the CEQA Evaluation, *Tribal Cultural Resources*.

Field Surveys

Nearly all of the APE has been surveyed previously for prior projects, including those conducted by Holson (2013), Leach-Palm and Meyer (2014), and DeBaker et al. (2015), as well as by Far Western as part of the I-680 Southbound Express Lanes Project (Whitaker & Kaijankoski, 2016). For the current undertaking, Far Western conducted multiple pedestrian archaeological surveys from the summer of 2020 to summer of 2021 (Far Western Anthropological Research Group, 2023). This field effort focused solely on newly expanded areas of the Project that had not been surveyed previously. No surface archaeological materials were observed in the archaeological APE during the pedestrian survey. JRP performed field surveys of built-environment resources within the APE on March 25 and May 20, 2021 (JRP Historical Consulting, 2023).

Extensive studies have previously been conducted, as part of prior undertakings, within the current project APE to identify archaeological resources, including Extended Phase I studies by Meyer and Leach-Palm (2014) and Kaijankoski, Meyer, Scher, & Whitaker (2016). The majority of the current APE has been cleared for construction through previous efforts. An Extended Phase I Report (Far Western Anthropological Research Group, 2023) was prepared for the proposed undertaking for proposed activities in proximity to the Rudgear Road Undercrossing.

Summary of Findings

The records search identified 14 resources within the APE, including 3 prehistoric (archaeological) sites and 11 built environment resources. Two of the archaeological sites are located within the APE but are not within the ADI for the current project and one is either misplotted or has been destroyed within the APE due to past highway construction activities as discussed below. One additional resource, Peyton Marsh Drainage System (P-07-002685), was identified during the records search. After further consideration and analysis of design plans, it was determined that the resource would not intersect with the APE and, as such, was excluded from further evaluation. In addition to the built environment and pre-contact archaeological sites within the APE, 91 resources have been recorded within one-quarter mile of the APE. Of these, 14 are archaeological sites and 77 are built environment.

The following three additional built environment resources were identified in the APE for inventory and formal evaluation: 511 Lawrence Way, 2389 North Main Street, and 1666 Terrace Road (JRP Historical Consulting, 2023). All three of these resources are in the city of Walnut Creek and were evaluated and determined not eligible for listing in the NRHP or CRHR. No comments on these determinations of eligibility were received from SHPO, and as such, concurrence is dated September 14, 2023, pursuant to Stipulation VIII.C.6.a of the Section 106 PA.

The Contra Costa Canal (P-07-002695) and the Mokelumne Aqueduct (P-07-002612) were previously determined eligible for listing in the NRHP. The SHPO concurred with those determinations. As a result, these two resources are also listed in the CRHR.

The Walnut Creek and Grayson Creek Levees (P-07-002731) were previously determined not eligible for listing in the NRHP, and the SHPO concurred with that determination. There are also 65 bridges in the APE that were previously determined ineligible for the NRHP, and their determinations remain valid. Caltrans is assuming an additional three resources in the APE are eligible for the NRHP with agreement from the Cultural Studies Office for the purposes of this Project, pursuant to Stipulation VIII.C.4 of the Section 106 PA. The assumed eligible resources are the Southern Pacific Railroad Northern Contra Costa Route (P-07-000500), Bay Area Rapid Transit (BART), and Contra Costa – Moraga Transmission Line (P-07-004688). The Southern Pacific Railroad ROW (P-07-000196) meets the Section 106 PA criteria for Properties Exempt from Evaluation under Property Type 1.

Potential for Presence of Buried Resources

The proposed Project would require subsurface disturbance in the form of excavations for retaining walls, bridge abutments, foundation piles, HOV/express lane gantry foundations, best management practice areas, and utility pole relocation. Previous studies and project vicinity geomorphology were used to develop a model of weighted sensitivity to assess the APE's likelihood to contain buried archaeological deposits.

The model indicated that the majority of the APE has low or lowest potential for buried sites. However, the *Archaeological Survey Report* estimated that approximately 16.7 percent of the Project area does contain areas of high or very high sensitivity for buried archaeological resources. Because the APE contains areas sensitive for buried archaeological resources, a program of geoarchaeological testing was undertaken as part of 2015 field efforts. An Extended Phase I Report (Far Western Anthropological Research Group, 2023) was prepared for the proposed undertaking for proposed activities in proximity to the Rudgear Road Undercrossing. No previously undocumented archaeological resources were encountered.

2.1.10.3 Environmental Consequences

There are historic sites within the Project vicinity protected by Section 4(f) of the Department of Transportation Act of 1966. This project will result in a "use" of those facilities, as defined by Section 4(f). Additional details are provided in Appendix A, *Section 4(f)*.

No-Build Alternative

The No-Build Alternative would maintain the current configurations of I-680 in the APE. Under the No-Build Alternative, the proposed Project would not be constructed, and no impacts on cultural resources would occur.

Build Alternatives (Alternatives 1C, 2, 3, and 5)

Within the APE, five cultural resources have been determined eligible for inclusion in the NRHP. Measures **CUL-1** through **CUL-2** would be implemented to avoid impacts to archaeological resources. The five cultural resources within the APE are the Southern Pacific Railroad Northern Contra Costa Route (P-07-000500), Contra Costa Canal (P-07-002695), Mokelumne Aqueduct (P-07-002612), BART, and Contra Costa – Moraga Transmission Line (P-07-004688). All five resources are on or eligible for listing in the NRHP and CRHR. Three of the resources have not been formally evaluated but are assumed eligible for the Project.

> *Southern Pacific Railroad Northern Contra Costa Route:* These railroad tracks cross through the APE adjacent to Waterfront Road/Marina Vista Avenue, near the Benicia-Martinez Bridge Toll Plaza. The Project does not include any construction activities or permanent improvements north of PM 23.1. Therefore, the Project would not impact this resource.
>
> *Contra Costa Canal:* The canal crosses I-680 at PM 22.8, PM 21.9, and PM 16.1. At PM 22.8, the canal is an underground pipe that crosses I-680 near Arthur Road. The Project could include installing utilities over the underground pipe, which would be confirmed during final design. At PM 21.9, the canal is an open, concrete-lined channel flanked by a dirt/gravel road that crosses under I-680. All Build Alternatives include installing utilities that would span the canal at this location. Utilities would either be installed on concrete piers beside the canal walls, similar to existing conduit at this location, or installed between the fence

line and I-680 guardrail. Regardless, the construction contractor would avoid altering the canal physically.

The canal crosses under the Contra Costa Canal Undercrossing Bridge (No. 28 0135) at PM 16.1. Under the bridge, the canal features a control gate on the canal's north sidewall and a concrete check that crosses the width of the canal. East of the bridge, the canal passes under BART tracks and Jones Road in a concrete box culvert supported on the north by a concrete-bag retaining wall. The Contra Costa Canal Trail/Briones to Mount Diablo Regional Trail is adjacent to the canal at this location. The canal's character-defining features within the APE include the concrete-lined open canal that follows the natural terrain to maintain a steady elevation. The control gate and check at PM 16.1 are also considered character-defining features, while the culvert that passes under BART was built after the period of significance and does not contribute to the historic property's significance. Alternative 1C would not widen the Contra Costa Canal Undercrossing Bridge. Alternatives 2, 3, and 5 would widen the Contra Costa Canal Undercrossing Bridge 33 feet to the east of the existing structure. The bents and columns would follow the alignment of their counterpart features on the existing structure. No temporary or permanent physical alterations would occur to the segment of the canal that crosses under the Contra Costa Canal Undercrossing Bridge (No. 28 0135). Any temporary falsework that would be needed for bridge widening would span the historic boundary of the canal completely. Netting and other protective measures would be used to prevent items and materials from falling into the canal.

Mokelumne Aqueduct: Three parallel pipelines cross beneath I-680 at the I-680/SR-242 Interchange. The Mokelumne aqueduct consists of three pipelines buried along the center of a 100-foot-wide corridor. Alternatives 1C, 2, and 3 propose adding pavement to the outside (east) shoulder of northbound I-680 where the freeway crosses over the Mokelumne Aqueduct. Proposed construction activities at this location would be no deeper than 4 feet and the pipelines are more than 15 feet below the freeway grade. All proposed construction activities and permanent improvements would occur well above this resource.

BART: The transit service is along northbound I-680 near Treat Boulevard and Parkside Drive and then crosses I-680 north of SR-24 at the BART Central Contra Costa Line I-680 Overpass. All Build Alternatives were designed to avoid physical destruction of, or damage to, all or part of BART, including its abutment and retaining wall on the west end of the BART Central Contra Costa Line I-680 Overpass.

Contra Costa – Moraga Transmission Line: All Build Alternatives would add a northbound lane within the existing Caltrans ROW and install a gantry toll reader within the vicinity of the transmission line. The transmission line tower base is approximately 100 feet above the freeway and the towers appear to be at least

70 feet tall. As such, all proposed construction activities and permanent improvements would occur well below this resource.

The Section 106 finding for the Project is a Finding of No Adverse Effect without Standard Conditions. Pursuant to 36 CFR 800.5(c) and Stipulation X.B.2 of the Section 106 Programmatic Agreement, SHPO concurred with this determination in a letter dated April 17, 2024 (see Appendix F, *Consultation and Coordination*).

2.1.10.4 Summary

*Alternative 2 has been selected as the preferred alternative. As discussed above, Alternative 2 would not adversely affect cultural resources. Measures **CUL-1** and **CUL-2**, requiring all work cease in the vicinity of an unanticipated discovery of a cultural resource or human remains, respectively, would be implemented.*

2.1.10.5 Avoidance, Minimization, and/or Mitigation Measures

CUL-1 **Unanticipated Discovery of Cultural Resources.** 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.

CUL-2 **Unanticipated Discovery of Human Remains.** If human remains are discovered, California Health and Safety Code (H&SC) Section 7050.5 states that further disturbances and activities shall stop in any area or nearby area suspected to overlie remains, and the County Coroner contacted. If the remains are thought by the coroner to be Native American, the coroner will notify the Native American Heritage Commission (NAHC), who, pursuant to PRC Section 5097.98, will then notify the Most Likely Descendent (MLD). At this time, the person who discovered the remains will contact District Environmental Branch 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.

With implementation of the avoidance and minimization measures described above, mitigation measures would not be required to address the Project's potential cultural resources.

2.2 PHYSICAL ENVIRONMENT

2.2.1 Hydrology and Floodplain

2.2.1.1 Regulatory Setting

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 Federal Highway Administration (FHWA) requirements for compliance are outlined in 23 Code of Federal Regulations (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." An encroachment is defined as "an action within the limits of the base floodplain."

2.2.1.2 Affected Environment

The following discussion is based on the proposed Project's *Location Hydraulic Study* (WRECO, 2022a), *Water Quality Assessment Report* (WRECO, 2022b), and *Natural Environment Study* (HDR Engineering, Inc., 2022). The Project Study Limits were ultimately reduced in October 2023, which is described in Section 1.4.6, *Alternatives Considered but Eliminated from Further Discussion Prior to Draft Environmental Impact Report/Environmental Assessment*. The affected environment description is based on the prior Project Study Limits.

Hydrology

The Project is located within the Suisun Hydrologic Unit (207.0) and within the Pittsburg (207.31), Martinez (207.33), and Walnut Creek (207.32) Hydrologic Sub-Areas. The Project Study Limits were reduced in October 2023 (Figure 1-10). These limits cross eight waterbodies. A description of these waterbodies is provided in this section and shown in Figure 2.2.1-1. Each of these waterbodies eventually discharge to Suisun Bay, located approximately 2 miles north of the prior Project Study Limits.



Figure 2.2.1-1. Water Crossings

- **San Ramon Creek at Livorna Road.** A tributary stream to San Ramon Creek, crosses Interstate 680 (I-680) approximately 0.02 mile north of Livorna Road. The stream originates near the southern end of Sugarloaf Hill, crosses I-680 through an 18-inch reinforced concrete pipe, and outfalls into San Ramon Creek west of I-680.
- **San Ramon Creek at Rudgear Road.** San Ramon Creek crosses under I-680 through a channel just west of Rudgear Road and continues north on the eastern side of I-680. The San Ramon headwaters originate on the western side of Rocky Ridge via Bollinger Creek.
- **Tice Creek.** Tice Creek crosses I-680 approximately 0.06 mile north of the I-680/Lilac Drive Undercrossing. The Tice Creek headwaters are in Rossmoor. Tice Creek crosses I-680 in an underground culvert and resurfaces immediately into Las Trampas Creek.
- **Las Trampas Creek.** Las Trampas Creek crosses I-680 approximately 0.07 mile north of the I-680/Newell Road Undercrossing. The Las Trampas Creek headwaters are in Las Trampas Ridge near St. Mary's College in Moraga. Las Trampas Creek crosses I-680 in an unlined channel. The I-680 bridge spans over Las Trampas Creek.
- **Walnut Creek.** Walnut Creek does not cross I-680, but it does flow along the east side of I-680. It crosses under Sun Valley Boulevard and diverts east, away from I-680.
- **Grayson Creek.** Grayson Creek crosses I-680 approximately 0.27 mile south of the I-680/SR-4 Interchange. The Grayson Creek headwaters are in the Briones Hills near Briones Regional Park. Grayson Creek crosses I-680 in an unlined channel. The I-680 bridge spans over Grayson Creek.
- **Pacheco Creek.** Pacheco Creek, also known as the Vine Hill Creek area, crosses I-680 approximately 0.15 mile south of the I-680/Pacheco Boulevard Interchange. The Pacheco Creek headwaters are in Vine Hill. Pacheco Creek crosses I-680 in an underground culvert.

Floodplains

The Project Study Limits are located within Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panel Numbers 06013C0088H, 06013C0089H, 06013C0289G, and 06013C0293G (effective March 21, 2017); and FIRM Panel Numbers 06013C0277F, 06013C0281F, 06013C0283F, 06013C291F, 06013C0287F, and 060130431F (effective June 16, 2009). The FEMA FIRM Panels show the Project Study Limits as being located within the following Special Flood Hazard Areas (SFHA) (Figure 2.2.1-2):

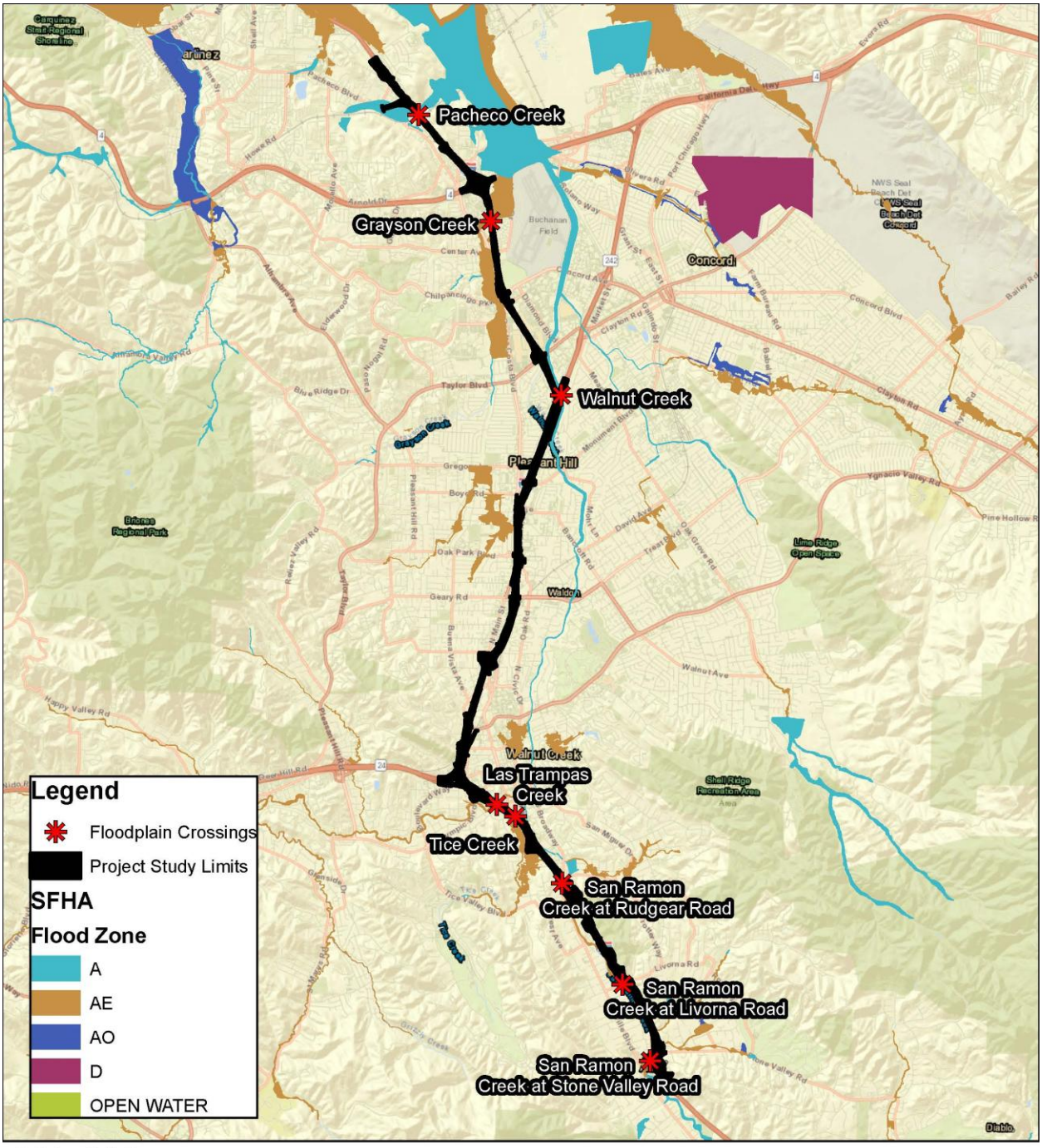


Figure 2.2.1-2. Floodplain Crossings within Project Study Limits

- Zone A is for areas subject to inundation by the 100-year flood event, using approximate methodologies. Base flood elevations are not shown.

- Zone AE is for areas subject to inundation by the 100-year flood event, where detailed hydraulic analyses have been performed. Base flood elevations are shown.

- Zone X (shaded) is for areas within the 500-year floodplain, areas within the 100-year floodplain with depths less than 1 foot, areas within the 100-year floodplain with watersheds less than 1 mile, and areas protected from the 100-year flood event by a levee. Base flood elevations are not shown.

- Zone X (unshaded) is for areas outside the 100-year and 500-year floodplains.

As shown in Figure 2.2.1-2, the Project is located within or near 100-year floodplains, designated as Zone A or Zone AE, that are associated with the following waterbodies (WRECO, 2022a):

- **San Ramon Creek at Livorna Road.** The San Ramon Creek along I-680, north of Livorna Road, is a Zone AE floodplain and is also located within a regulatory floodway. According to CFR Title 44, Section 60.3(d)(3), a community shall "prohibit encroachments, including fill, new construction, substantial improvements, and other development, within the adopted regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base flood discharge." A bridge at Livorna Road over San Ramon Creek directly west of I-680 has a base flood elevation (BFE) of 229 feet. The BFE is determined by FEMA and is the expected water level rise during a flood with a 1 percent (1%) chance of occurring in in any given year. No BFE increase of any amount is allowed in the floodway.

- **San Ramon Creek at Rudgear Road.** The San Ramon Creek crossing at Rudgear Road is located within floodplains designated as Zone AE to Zone A.

- **Tice Creek.** The Tice Creek crossing at Lilac Road is a Zone AE floodplain. The BFE is 157 feet at the upstream side of the crossing.

- **Las Trampas Creek.** Las Trampas Creek crossing is a Zone AE floodplain and floodway. The BFE upstream of the I-680 Trampas Creek crossing is 152 feet. There are no proposed impacts within this floodplain.

- **Walnut Creek.** Walnut Creek Zone A floodplain runs along the east side of I-680.

- **Grayson Creek.** I-680 crosses through a shaded Zone X south of Grayson Creek. I-680 crosses Zone AE at Center Avenue. I-680 crosses Zone AE south of the SR-4 Interchange at Grayson Creek. I-680 passes over a floodway area with BFEs between 18 and 19 feet.

- **Pacheco Creek (Vine Hill Creek).** I-680 crosses a Zone A floodplain at Pacheco Creek. Zone A floodplains do not have BFE.

Natural and Beneficial Floodplain Values

Natural and beneficial floodplain values associated with uses within the Project Study Limits include, but are not limited to, wildlife, plants, outdoor recreation, water quality maintenance, and groundwater recharge, which are further discussed below.

Wildlife

As discussed in Section 2.3.1, *Natural Communities*, a biological study area (BSA) has been developed for the proposed Project. The BSA was established to evaluate the Project's effects on natural communities and other biological resources. Twenty-two special-status wildlife species have the potential to occur in the BSA. Further information on wildlife species can be found in Section 2.3.1, *Natural Communities*; Section 2.3.4, *Animal Species*; and Section 2.3.5, *Threatened and Endangered Species*.

Plants

Only one special-status plant species, Congdon's tarplant (*Centromadia parryi ssp. congdonii*), has the potential to occur in the BSA. Further information on plant species can be found in Section 2.3.1, *Natural Communities*; Section 2.3.3, *Plant Species*; and Section 2.3.6, *Invasive Species*.

Outdoor Recreation

As discussed in Section 2.1.3, *Parks and Recreational Facilities*, multiple recreation trails are located within the Community Impact Study Area. The Iron Horse Regional Trail is located adjacent to Walnut Creek and San Ramon Creek where it is a lined channel within the Project Study Limits. The Contra Costa Canal Trail/Briones to Mount Diablo Regional Trail is located adjacent to the Contra Costa Canal where it is a lined channel within the Project Study Limits. Within the Project Study Limits, these trails do not include aquatic habitat. Further information on outdoor recreational resources can be found in Section 2.1.3, *Parks and Recreational Facilities*.

Water Quality Maintenance

The San Francisco Bay Regional Water Quality Control Board (RWQCB) Basin Plan (Basin Plan) has designated beneficial uses for San Ramon Creek, Tice Creek, Las Trampas Creek, Walnut Creek, Grayson Creek, Peyton Slough, and Suisun Bay (listed in Table 2.2.1-1). No beneficial uses for Pacheco Creek are defined in the Basin Plan. A

beneficial use is one of the various ways that water can be used for the benefit of people and/or wildlife. Examples of beneficial use include drinking, swimming, industrial water supply, and support of fresh aquatic habitats.

Table 2.2.1-1. Beneficial Uses for Receiving Waters

Water Body	Beneficial Uses												
	IND	COMM	PROC	COLD	EST	MIGR	RARE	SPWN	WARM	WILD	REC-1	REC-2	NAV
San Ramon Creek and unlisted tributaries	-	-	-	-	-	-	-	-	E	E	E	E	-
Tice Creek	-	-	-	-	-	-	E	-	E	E	E	E	-
Las Trampas Creek	-	-	-	E	-	-	E	-	E	E	E	E	-
Walnut Creek	-	-	-	E	-	E	E	E	E	E	E	E	-
Grayson Creek	-	-	-	E	-	E	E	-	E	E	E	E	-
Peyton Slough	E	E	-	-	E	E	E	-	-	E	E	E	-
Suisun Bay	E	E	E	-	E	E	E	E	-	E	E	E	E

Source: (WRECO, 2022b)
Notes:
COLD = cold freshwater habitat; COMM = commercial and sports fishing; E = existing; EST = estuarine habitat; IND = industrial service supply; MIGR = fish migration; NAV = navigation; PROC = industrial process supply; RARE = preservation of rare and endangered species; REC-1 = water contact recreation; REC-2 = non-contact water recreation; SPWN = fish spawning; WARM = warm freshwater habitat; and WILD = wildlife habitat

San Ramon Creek, Tice Creek, Las Trampas Creek, Pacheco Creek, and Peyton Slough are not listed in the 2018 *California Integrated Report* (Clean Water Act Section 303[d] List/305[b] Report) as impaired, nor have total maximum daily loads (TMDL) been established. Walnut Creek, Grayson Creek, and Suisun Bay are listed as impaired water bodies in the 2018 *California Integrated Report* (Clean Water Act Section 303[d] List/305[b] Report).

Further information on water quality maintenance can be found in Section 2.2.2, *Water Quality and Stormwater Runoff*.

Groundwater Recharge

The Project Study Limits span the Ygnacio Valley groundwater basin and are near the San Ramon Valley groundwater basin. Table 2.2.1-2 lists the existing and potential

beneficial uses designated by the Basin Plan for the Ygnacio Valley and San Ramon Valley groundwater basins.

Table 2.2.1-2. Beneficial Uses for Groundwater Basins

Groundwater Basin	Beneficial Uses			
	MUN	PROC	IND	AGR
Ygnacio Valley	P	P	P	P
San Ramon Valley	E	P	P	E

Source: (WRECO, 2022b)
Notes:
AGR = Agricultural water supply; E = Existing; IND = Industrial service water supply; MUN = Municipal and domestic water supply; P = Potential; and PROC = Industrial process water supply

The *Caltrans District 4 Stormwater Management Program Work Plan* (Caltrans 2021) identifies several drinking water reservoirs or recharge facility areas within Contra Costa County; however, the Project is not anticipated to impact any of these reservoirs or recharge facilities.

Further information on groundwater can be found in Section 2.2.2, *Water Quality and Stormwater Runoff*.

2.2.1.3 Environmental Consequences

EO 11988 requires federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative.

As defined by FHWA Title 23, CFR, Part 650, Subpart A (23 CFR 650A), a significant encroachment is a highway encroachment or any action to promote base floodplain development that involves one or more of the following construction or flood-related impacts: (1) a significant potential for the interruption or termination of a transportation facility that is needed for emergency vehicles or that provides a community's only evacuation route, (2) a significant risk, or (3) a significant adverse impact on the natural and beneficial floodplain values.

As mentioned previously, natural and beneficial floodplain values associated with the Project include, but are not limited to, wildlife, plants, outdoor recreation, water quality maintenance, and groundwater recharge. Temporary and/or permanent impacts on natural and beneficial floodplain values are discussed further in this section.

No-Build Alternative

The No-Build Alternative would maintain the current configurations of I-680 in the Project Study Limits. Under the No-Build Alternative, the proposed Project would not be constructed, and no impacts on hydrology or floodplains would occur.

Build Alternatives (Alternatives 1C, 2, 3, and 5)

Temporary Impacts

Natural and Beneficial Floodplain Values

Wildlife

The discussion below focuses on potential temporary impacts to special-status wildlife species that may have a potential to occur within creek channels that cross the Project Study Limits, specifically northwestern pond turtle and California red-legged frog. Further information on all other special-status wildlife species that have the potential to occur within the BSA can be found in Section 2.3.1, *Natural Communities*; Section 2.3.4, *Animal Species*; and Section 2.3.5, *Threatened and Endangered Species*.

- Northwestern Pond Turtle (*Actinemys marmorata*): Northwestern pond turtle is a federally proposed threatened species and California Species of Special Concern. Northwestern pond turtle is most likely to occur in the BSA in the vicinity of McNabney Marsh and Moorhen Marsh. In addition, there is a low potential for the species to occur in San Ramon Creek at the Rudgear Road Undercrossing. Alternatives 1C, 2, and 3 include widening the Rudgear Road Undercrossing Bridge. Alternative 5 would not include widening this bridge. At this location, San Ramon Creek is concrete-lined, and the surrounding ground is hardscaped. These conditions do not provide suitable nesting habitat for the species in that area, but the species may use the creek for dispersal between areas of more suitable habitat. Falsework would be installed over San Ramon Creek to prevent debris and other contaminants from entering the creek during construction. Direct impacts on northwestern pond turtle could occur within the proposed Project construction areas as a result of being crushed by construction equipment or trapped in open excavations or if fugitive dust from construction activities or artificial lighting from the proposed Project were to encroach on suitable habitat outside the construction areas. However, all Build Alternatives would implement the standard and general measures **BIO-GEN-1** through **BIO-GEN-16**, and **BIO-TURTLE-1**, as discussed in Section 2.3.1, *Natural Communities,* and Section 2.3.5, *Threatened and Endangered Species*. No substantial temporary adverse direct or indirect impacts on northwestern pond turtle are anticipated to occur under the Build Alternatives.

- California Red-Legged Frog (*Rana draytonii*): California red-legged frog is a federally threatened amphibian species and a California Species of Special

Concern. According to the California Natural Diversity Database (CNDDB), there are 13 California red-legged frog occurrences within 5 miles of the BSA. This includes a tributary to San Ramon Creek that is upstream of the BSA. Within the BSA, San Ramon Creek is shallow and concrete-lined with only sparse vegetation and crosses under the Rudgear Road Undercrossing Bridge. This segment of San Ramon Creek could be potential dispersal habitat for California red-legged frog but would not be suitable breeding habitat for the species. No CNDDB occurrences have been documented in Las Trampas Creek or from the main body of Walnut Creek to Suisun Bay.

The land surrounding the BSA is almost entirely urban, consisting of residential and commercial development, along with numerous heavily traveled roads. This development, which contains structural barriers including, but not limited to, concrete road dividers, retaining walls, and residential fences, represents a major barrier to the dispersal of California red-legged frogs. Due to the absence of breeding habitat, limited aquatic dispersal habitat, and multiple passage barriers, there is a low likelihood that California red-legged frog would be found within the BSA or affected by Project activities.

Direct impacts on California red-legged frog could occur as a result of being crushed by construction equipment or trapped in open excavations, or if fugitive dust from construction activities or artificial lighting from the proposed Project were to encroach on suitable California red-legged frog habitat outside the construction areas. However, all Build Alternatives would implement the standard and general measures **BIO-GEN-1** through **BIO-GEN-16** and measures **BIO-FWS-1** through **BIO-FWS-4**. Further discussion on these measures can be found in Section 2.3.1, *Natural Communities,* and Section 2.3.5, *Threatened and Endangered Species*. No substantial temporary adverse direct or indirect impacts on California red-legged frog are anticipated to occur under the Build Alternatives.

Plants

Grassland habitat, such as brome grassland, could support Congdon's tarplant. However, as discussed in Section 2.3.1, *Natural Communities*, there would be no temporary impact on any land cover type other than developed land. No substantial temporary adverse impacts on Congdon's tarplant or any other rare plant species are anticipated.

Outdoor Recreation

A portion of the Iron Horse Trail is located adjacent to San Ramon Creek, a lined channel within the Project Study Limits. The proposed Project would result in permanent impacts on the Iron Horse Regional Trail under Build Alternatives 1C, 2, and 5. These alternatives include widening the Rudgear Road Undercrossing Bridge over the Iron Horse Regional Trail, temporarily detouring the trail for up to 4 weeks and permanently shifting the trail under the bridge. Caltrans would work with the East Bay Regional Park

District to identify temporary detours and the permanent trail relocation prior to construction.

The Contra Costa Canal Trail/Briones to Mount Diablo Regional Trail is located adjacent to the Contra Costa Canal, a lined channel within the Project Study Limits. The Contra Costa Canal Trail/Briones to Mount Diablo Regional Trail would be impacted temporarily during construction under Alternatives 2, 3, and 5. These alternatives include widening the Contra Costa Canal Undercrossing Bridge, temporarily closing approximately 0.2 mile of the trail for 2 to 3 weeks. Caltrans would work with the East Bay Regional Park District to identify potential detours for this trail segment prior to construction.

The Iron Horse Regional Trail and the Contra Costa Canal Trail//Briones to Mount Diablo Regional Trail within the Project Study Limits do not include aquatic habitat. Implementing the Build Alternatives would not result in a barrier to fish passage, nor would the Project block or otherwise alter channel flow in any channel where fish may occur. No temporary direct or indirect impacts to aquatic habitat, channel flow, or fish passage are anticipated to occur under the Build Alternatives.

Water Quality Maintenance

The Build Alternatives would involve cut-and-fill, grading, and excavation activities, which have the potential to increase erosion and result in temporary direct and indirect water quality impacts. Soil erosion, especially during heavy rainfall, can increase the suspended solids, dissolved solids, and organic pollutants in stormwater runoff generated within the Project Study Limits. Further, fueling or maintenance of construction vehicles could occur within the Project Study Limits during construction; thus, there would be a risk of accidental spills or releases of fuels, oils, or other potentially toxic materials. An accidental release of these materials could pose a threat to water quality if contaminants enter local receiving waters and storm drains.

However, all Build Alternatives would be compliant with the National Pollutant Discharge Elimination System (NPDES) Construction General Permit (Measure **WQ-1**), which would require the implementation of temporary Best Management Practices (BMP) to minimize temporary water quality impacts associated with Project construction. All Build Alternatives would also require the preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP) (Measure **WQ-2**), which would implement soil erosion and pollution prevention control measures and also minimize temporary impacts on water quality, as discussed in Section 2.2.2, *Water Quality and Stormwater Runoff*. No substantial temporary adverse direct or indirect impacts on water quality would occur under the Build Alternatives.

Floodplain Encroachment

As shown in Figure 2.2.1-2, the Project is located within or near 100-year floodplains designated as Zone A or Zone AE. However, the proposed Project would not result in any floodplain encroachment, as discussed below.

- **San Ramon Creek at Livorna Road.** San Ramon Creek crosses Livorna Road on the west side of I-680. This location is within a 100-year floodplain designated as Zone AE and within a regulatory floodway with a 229-foot BFE. The Project proposes to place a treatment BMP near the floodway along San Ramon Creek at Livorna Road (PM R11.33). The treatment BMP is expected to be designed above the 229-foot BFE and therefore would not encroach into the floodplain or impact the water surface elevation. No work is proposed within the San Ramon Creek 100-year floodplain at Livorna Road.

- **San Ramon Creek at Rudgear Road.** The San Ramon Creek crossing at Rudgear Road is located within floodplains designated as Zone AE to Zone A. San Ramon Creek crosses under I-680 through a channel just west of Rudgear Road where the floodplain transitions from Zone AE with a floodway to Zone A. The BFE west of the bridge is 184 feet. Alternatives 1C and 3 proposes added impervious area on either side of the Zone A floodplain downstream of the crossing. Alternatives 2 and 3 would have additional grading down the east slopes on either side of the Zone A floodplain but not within the floodplain. Alternative 5 is expected to have no grading at this location. In addition, a northbound bridge widening of 17 feet 8 inches is proposed at Rudgear Road. Four piers would be extended to accommodate the widening. The bridge widening piers and abutment are assumed to be outside of the concrete-lined channel and floodplain.

- **Tice Creek.** The Tice Creek crossing at Lilac Road is a Zone AE floodplain. The BFE at the upstream side of the crossing is 157 feet. Electrical work and a new sign are proposed on the I-680 roadway, which is assumed to be above the 157-foot BFE and outside of the Tice Creek 100-year floodplain. In addition, a guardrail is proposed along the west side of I-680 outside of the floodplain. No work is proposed within the Tice Creek 100-year floodplain.

- **Las Trampas Creek.** The Las Trampas Creek crossing is a Zone AE floodplain and a floodway. No work is proposed within the Las Trampas Creek 100-year floodplain.

- **Walnut Creek.** Walnut Creek Zone A floodplain runs along the east side of I-680. No work is proposed within the Walnut Creek 100-year floodplain.

- **Grayson Creek.** I-680 crosses through a shaded Zone X south of Grayson Creek at Center Avenue. The Zone AE floodplain crosses I-680 and enters the southbound lanes in the vicinity as well. I-680 crosses Zone AE south of the SR-4 Interchange at Grayson Creek. I-680 passes over a floodway area with BFEs between 18 and 19 feet. BMPs are proposed on the northwest side of I-680, outside of the Grayson Creek 100-year floodplain. No Build Alternatives propose construction within the 100-year floodplain.

- **Pacheco Creek.** I-680 crosses a Zone A floodplain at Pacheco Creek and Zone AE floodplain at the north end of the site in the vicinity of Peyton

Slough. A treatment BMP and trash capture device are proposed north and outside of the Pacheco Creek 100-year floodplain. No Build Alternatives propose construction within the 100-year floodplain.

Although the proposed Project is located within 100-year floodplains associated with several waterbody crossings, no construction activity is anticipated to occur within the floodplains or result in floodplain encroachment that would interfere with flows within the channels. Therefore, under all Build Alternatives, the proposed Project is not anticipated to result in any temporary direct or indirect impacts on floodplains.

Permanent Impacts

Natural and Beneficial Floodplain Values

Wildlife

The discussion below focuses on potential permanent impacts on special-status wildlife species that may have a potential to occur within creek channels that cross the Project Study Limits, specifically northwestern pond turtle and California red-legged frog. Further information on all other special-status wildlife species that have the potential to occur within the BSA can be found in Section 2.3.1, *Natural Communities*; Section 2.3.4, *Animal Species*; and Section 2.3.5, *Threatened and Endangered Species*.

- Northwestern Pond Turtle: Measures **BIO-GEN-1** through **BIO-GEN-16** and **BIO-TURTLE-1** would be implemented. No substantial permanent adverse impacts on northwestern pond turtles are anticipated to occur under the Build Alternatives.

- California Red-Legged Frog: Measures **BIO-GEN-1** through **BIO-GEN-16** and **BIO-FWS-1** through **BIO-FWS-4** would be implemented. No substantial permanent adverse impacts on California red-legged frogs are anticipated to occur under the Build Alternatives.

Plants

The Project would result in the permanent loss of grassland habitat that could support special-status plant species, such as Congdon's tarplant, as described in Section 2.3.1, *Natural Communities*. Alternative 1C would permanently impact approximately 1.55 acres of brome grassland, Alternatives 2 and 3 would permanently impact approximately 1.73 acres of brome grassland, and Alternative 5 would permanently impact approximately 0.37 acre of brome grassland. Based on the negative findings during the field surveys, negative findings during focused rare plant surveys conducted by Caltrans for previous projects that overlap the BSA, and the low quality of habitat within the Project's impact areas, the likelihood for Congdon's tarplant to be present in the BSA is considered moderate. Since the Project would impact suitable habitat for the species, Measure **BIO-PLANTS-1**, as discussed in Section 2.3.3, *Plant Species*, would be implemented, which would require a pre-construction survey by a qualified biologist. If Congdon's tarplant or any other rare plant species is observed during this survey, it

will be protected by creating a no-work buffer to avoid impacts from construction activities, staging, or access. No substantial permanent adverse direct or indirect impacts on Congdon's tarplant or other rare plant species are anticipated to occur under the Build Alternatives.

Water Quality Maintenance

The proposed Project would require minimal fill along the floodplains under all Build Alternatives. In addition, the proposed Project would result in a 12.84-acre increase of impervious surface area under Alternative 1C, 9.06-acre increase under Alternative 2, 16.27-acre increase under Alternative 3, and 2.93-acre increase under Alternative 5. The increase in impervious area could result in an increase of sediment-laden flow discharging directly into receiving waterbodies (WRECO, 2022b), which could contribute to a violation of water quality standards. However, all Build Alternatives would include the installation of permanent BMPs to avoid the potential for Project-related stormwater discharges to substantially alter drainage patterns, violate water quality standards, or substantially degrade water quality. The proposed permanent BMPs include design pollution prevention BMPs (Measure **WQ-3**), such as preservation of existing vegetation, and treatment BMPs (Measure **WQ-4**), such as infiltration devices, which would reduce the amount of pollutants entering directly into surface waters. The final location of permanent BMPs would be determined during the final design phase and in compliance with permit requirements from regulatory agencies. Therefore, following implementation of these stormwater BMPs, no substantial permanent adverse direct or indirect impacts on water quality would occur under all Build Alternatives, as discussed in Section 2.2.2, *Water Quality and Stormwater Runoff*.

Floodplain Encroachment

The proposed Project is located within 100-year floodplains associated with several waterbody crossings; however, no Project-related activity or improvement is anticipated to occur within the floodplains. The Project would generally maintain the existing roadway profile.

A treatment BMP is proposed to be implemented in proximity to the floodway along San Ramon Creek at Livorna Road (PM R11.33), but the treatment BMP is expected to be designed above the 229-foot BFE and, therefore, would not encroach into the floodplain or impact the water surface elevation. No work is proposed within the San Ramon Creek 100-year floodplain at Livorna Road. Further analysis would be conducted during final design to confirm the treatment BMP would have no impacts to the BFE or floodplain (Measure **HYD-1**).

According to the *Location Hydraulic Study* (WRECO, 2022a), the proposed Project, under all Build Alternatives, can be classified as low risk to existing floodplains. The Project would not result in longitudinal floodplain encroachment and does not support incompatible floodplain development. The potential risk to life and property remains unchanged as a result of the Project. There is no increase in the BFE, and the Project does not alter the existing flooding source. The proposed Project does not adversely

impact the floodplains, and flood conveyance would be maintained. Additionally, the proposed Project would not result in any permanent impacts on the natural and beneficial floodplain values or termination of emergency services or emergency routes. Contra Costa Transportation Authority (Project Sponsor) would coordinate with local, State, and federal water resources and floodplain management agencies, including Contra Costa County Flood Control and Water Conservation District, as necessary, for all portions of the Project.

2.2.1.4 Summary

*Alternative 2 has been selected as the preferred alternative. As discussed above, Alternative 2 would not result in a longitudinal floodplain encroachment nor would it support incompatible floodplain development. Measure **HYD-1**, requiring additional hydrological analysis be conducted during final design, would be implemented. BMPs and general and species-specific measures would be implemented, which would avoid and/or minimize impacts on floodplain values and water quality maintenance. Therefore, Alternative 2 would not adversely affect floodplains or hydrology.*

2.2.1.5 Avoidance, Minimization, and/or Mitigation Measures

Measures **WQ-1** through **WQ-4** in Section 2.2.2, *Water Quality and Stormwater Runoff*; would require the preparation of an SWPPP and compliance with applicable NPDES permits. Measures **BIO-GEN-1** through **BIO-GEN-16** in Section 2.3.1, *Natural Communities*; Measure **BIO-PLANTS-1** in Section 2.3.3, *Plant Species*; and Measures **BIO-TURTLE-1** and **BIO-FWS-1** through **BIO-FWS-4** in Section 2.3.5, *Threatened and Endangered Species*, would minimize or avoid impacts on biological resources. In addition, the following minimization and avoidance measure would be implemented:

HYD-1 During final design, the Resident Engineer or designated contractor will ensure that treatment Best Management Practices (BMPs) in close proximity to the floodway along San Ramon Creek at Livorna Road (PM R11.33) will be analyzed to confirm the BMPs will have no impact on the base flood elevation or floodplain. The analysis will be coordinated with floodplain management agencies, including Contra Costa County Flood Control and Water Conservation District during the design phase.

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2.2.2 Water Quality and Stormwater Runoff

2.2.2.1 Regulatory Setting

Federal Requirements: 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[1] unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. 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. Regional Water Quality Control Boards (RWQCB) 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).
- 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."

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.

[1] A point source is any discrete conveyance such as a pipe or a man-made ditch.

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, USACE's decision to approve is based on compliance with the U.S. Environmental Protection Agency's (U.S. EPA) Section 404 (b)(1) Guidelines (40 Code of Federal Regulations [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 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 that would have fewer adverse effects. The Guidelines state that 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[2] standards, jeopardize the continued existence of listed species, violate marine sanctuary protections, or cause "significant degradation" to waters of the U.S. In addition, every permit from 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 Section 2.3.2, *Wetlands and Other Waters*.

State Requirements: 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 State Water Resources Control Board (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 in a project area 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

[2] The U.S. EPA defines "effluent" as "wastewater, treated or untreated, that flows out of a treatment plant, sewer, or industrial outfall."

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 (TMDL). 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. RWCQBs 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 (NPDES) 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 Caltrans as an owner/operator of an MS4 under federal regulations. Caltrans' MS4 permit covers all Caltrans rights-of-way, 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.

Caltrans' 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:

- Caltrans must comply with the requirements of the Construction General Permit (see below);
- Caltrans must implement a year-round program in all parts of the State to effectively control storm water and non-storm water discharges;
- 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, Caltrans developed the Statewide Storm Water Management Plan (SWMP) to address storm water pollution controls related to highway planning, design, construction, and maintenance activities throughout California. The SWMP assigns responsibilities within Caltrans 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 proposed 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 Storm Water Pollution Prevention Plans (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 Caltrans' SWMP and Standard Specifications, a Water Pollution Control Program (WPCP) is necessary for projects with DSA less than 1 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 proposed 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 USACE. The 401 permit certifications are obtained from the appropriate RWQCB, dependent on the Project location, and are required before 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.

Regional and Local Requirements

Basin Plan for the San Francisco Bay Region

Section 13240 of the Porter-Cologne Water Quality Control Act requires each RWQCB to formulate and adopt water quality control plans, or basin plans, for all areas within the region. Water quality within the Project Study Limits is regulated by the San Francisco Bay RWQCB through the *Water Quality Control Plan for the San Francisco Bay Basin* (Basin Plan) (San Francisco Bay Regional Water Quality Control Board, 2019).

The Basin Plan lists the beneficial surface water and groundwater uses in the region. Beneficial uses are the basis for establishing objectives to maintain and enhance water quality. These uses include domestic, municipal, agricultural, and industrial supply; power generation; navigation; preservation or enhancement of fish, wildlife, and other aquatic resources or preserves; recreation; and aesthetic enjoyment. The beneficial uses of surface waters and groundwaters in the basin are designated in the water quality control plans.

The Basin Plan also includes water quality objectives, which are the limits or levels of water quality constituents or characteristics, that are established for the reasonable protection of beneficial water uses or the prevention of nuisance within a specific area.

2.2.2.2 Affected Environment

This following discussion is based on the proposed Project's *Water Quality Assessment Report* (WRECO, 2022) and *Stormwater Data Report* (WRECO, 2024). The Project Study Limits were ultimately reduced in October 2023, which is described in Section 1.4.6, *Alternatives Considered but Eliminated from Further Discussion Prior to Draft Environmental Impact Report/Environmental Assessment*. The affected environment description is based on the prior Project Study Limits.

Regional and Local Hydrology

As discussed in Section 2.2.1, *Hydrology and Floodplain*, the proposed Project crosses the following waterbodies: San Ramon Creek at Livorna Road, San Ramon Creek at

Rudgear Road, Tice Creek, Las Trampas Creek, Walnut Creek, Grayson Creek, and Pacheco Creek. Stormwater runoff within the Project Study Limits eventually discharges to Suisun Bay, located more than 2 miles north of the Project Study Limits.

The proposed Project is also located within four watershed management areas: the San Ramon Creek Watershed, the Las Trampas Creek Watershed, the Grayson Creek/Murderer's Creek Watershed, and the Peyton Slough Watershed, as shown in Figure 2.2.2-1 and described below.

- **San Ramon Creek Watershed.** The San Ramon Creek Watershed encompasses approximately 54 square miles in the town of Danville, city of San Ramon, city of Walnut Creek, and unincorporated Contra Costa County. San Ramon Creek flows generally north to its confluence with Las Trampas Creek, where it becomes Walnut Creek. A large majority of San Ramon Creek's mainstem banks are constructed earthen channels, while its tributaries are mostly natural.

- **Las Trampas Creek Watershed.** The Las Trampas Creek Watershed encompasses parts of the cities of Lafayette, Moraga, and Walnut Creek and part of unincorporated Contra Costa County. Impervious surfaces in the Las Trampas Creek Watershed are estimated to cover approximately 25 percent of the land area. Las Trampas Creek is formed by several small, intermittent tributaries near Las Trampas Peak and flows north and east to its confluence with San Ramon Creek.

- **Grayson Creek/Murderer's Creek Watershed.** The Grayson Creek/Murderer's Creek Watershed encompass portions of the cities of Pleasant Hill, Concord, Walnut Creek, Martinez, and Lafayette and part of unincorporated Contra Costa County. Much of Grayson Creek is confined within a concrete or earthen channel. Impervious surfaces in Grayson Creek/Murderer's Creek Watersheds are estimated to make up approximately 45 percent of the land area.

- **Peyton Slough Watershed.** The Peyton Slough Watershed encompasses 6.5 square miles of the city of Martinez and unincorporated Contra Costa County. Over a third of the Peyton Slough's length is an underground culvert through residential and industrial areas. Over half of the watershed is urbanized, including the entire upper watershed.

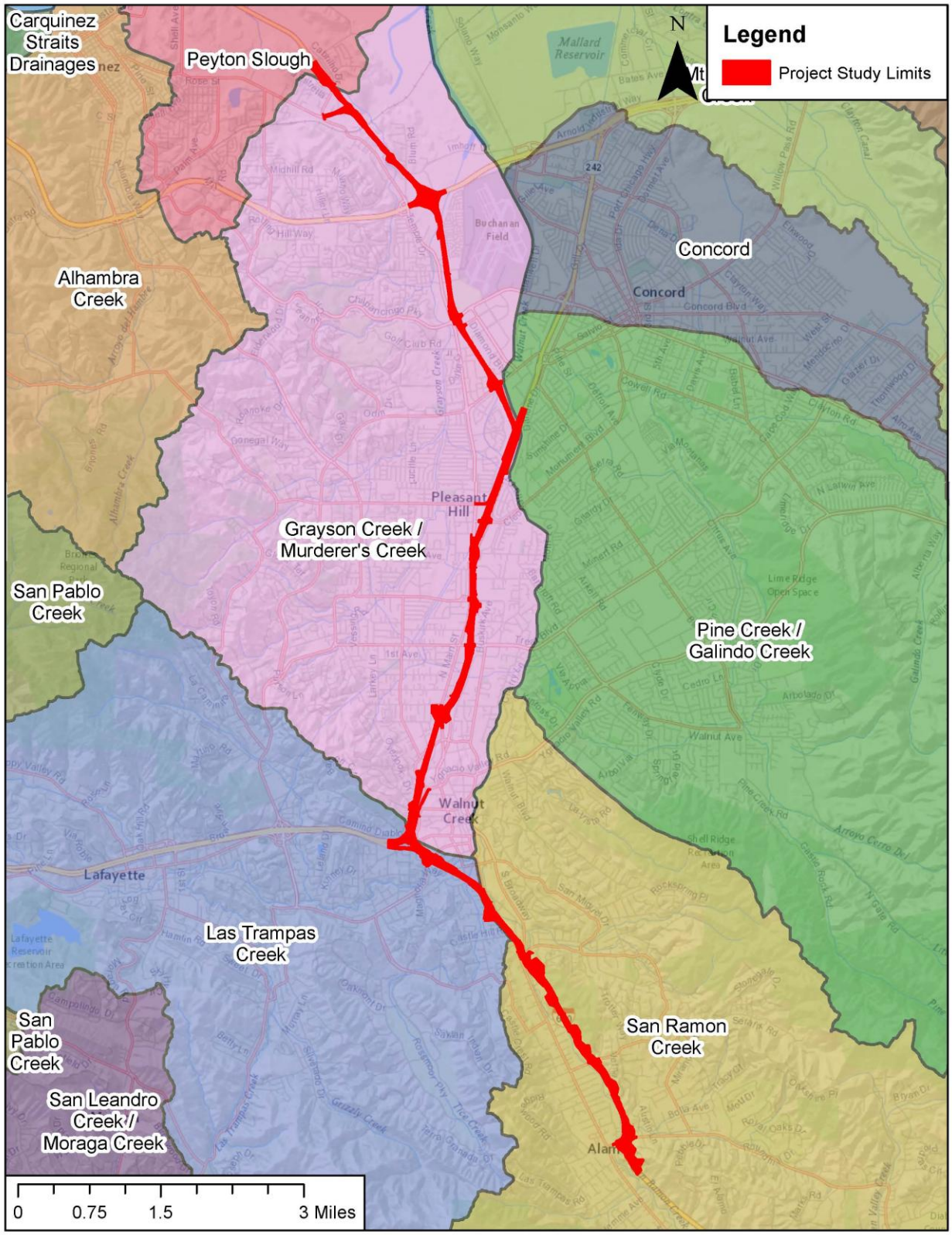


Figure 2.2.2-1. Watershed Map

The Contra Costa Canal, which is owned by the Contra Costa Water District, crosses through the Project Study Limits. The Contra Costa Canal flows from the City of Oakley to the Martinez Reservoir, located in the City of Martinez.

The Mokelumne Aqueduct crosses under I-680 at approximately PM 17.39 and runs parallel on the west side for approximately 1.5 miles before separating at the junction toward SR-242. The Mokelumne Aqueduct crosses I-680 in a closed conduit and is maintained by the East Bay Municipal Utility District.

Neither the Contra Costa Canal nor the Mokelumne Aqueduct would directly or indirectly receive runoff from the Project.

Surface Waters

The *Basin Plan* identifies beneficial uses and water quality objectives for surface waterbodies within the San Francisco Region (San Francisco Bay Regional Water Quality Control Board, 2019). The water quality objectives designate allowable limits of water quality constituents or characteristics that allow for the reasonable protection of surface water's beneficial uses. The beneficial uses for the San Ramon Creek at Livorna Road, San Ramon Creek at Rudgear Road, Tice Creek, Las Trampas Creek, Walnut Creek, Grayson Creek, Pacheco Creek, and Peyton Slough consist of IND, COMM, PROC, COLD, EST, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2, and/or NAV. Additional information on these beneficial uses is discussed in Section 2.2.1, *Hydrology and Floodplain*.

List of Impaired Waters

As a part of the CWA, the U.S. EPA created a 303(d) Program that assists states, territories, and authorized tribes in (1) submitting lists of impaired and threatened waters and (2) developing TMDLs based on the severity of the pollution and sensitivity of the waters. Waterbody impairments may be caused by water column exceedances, excessive sediment levels of pollutants, or bioaccumulation of pollutants. San Ramon Creek, Tice Creek, Las Trampas Creek, Pacheco Creek, and Peyton Slough are not listed on the *2022-2023 California Integrated Report* (Clean Water Act Section 303[d] List/305[b] Report) as impaired, nor have TMDLs been established. Walnut Creek, Grayson Creek, and Suisun Bay are listed as impaired waterbodies. Table 2.2.2-1 shows the list of pollutants associated with these impaired waterbodies, the source of the pollutant (if known), and when TMDLs were established for the pollutants.

Table 2.2.2-1. 303(d) Listed Pollutants

Water Body	Pollutant	Pollutant Source	Estimated TMDL Completion Date
Walnut Creek	Diazinon	Source Unknown	U.S. EPA Approved May 16, 2017
Grayson Creek	Trash	Source Unknown	Attainment Date January 1, 2029
Suisun Bay	Furan Compounds	Source Unknown	2019
	Polychlorinated biphenyls (PCB) (dioxin-like)	Agriculture	U.S. EPA Approved March 29, 2010
	Chlordane	Source Unknown	2029
	Dieldrin	Source Unknown	2013
	Invasive Species	Source Unknown	2019
	Dioxin compounds (including 2,3,7,8-TCDD)	Source Unknown	2019
	DDT (Dichlorodiphenyltrichloroethane)	Source Unknown	2013
	Mercury	Source Unknown	U.S. EPA Approved February 12, 2008
	PCBs	Source Unknown	U.S. EPA Approved March 29, 2010
	Selenium	Source Unknown	U.S. EPA Approved August 23, 2016

Source: (WRECO, 2022)

Notes:

TCDD = tetrachlorodibenzodioxin; TMDL = Total Maximum Daily Load; U.S. EPA = United States Environmental Protection Agency

Groundwater

The proposed Project is located within the Ygnacio Valley groundwater basin and near the San Ramon Valley groundwater basin, as shown in Figure 2.2.2-2.

The Ygnacio Valley groundwater basin encompasses approximately 25 square miles of northern Contra Costa County and is bounded by Suisun Bay on the north, I-680 and Taylor Road on the west, the Concord Fault on the east, and the city of Walnut Creek on the south.

The San Ramon Valley groundwater basin covers approximately 11 square miles of southern Contra Costa County and is bounded by Stone Valley to the north, the Las Trampas Ridge to the west, the Mount Diablo foothills to the east, and the Livermore Valley to the south.

The *Basin Plan* has the following designated beneficial uses for the Ygnacio Valley and the San Ramon Valley groundwater basins: MUN, PROC, IND, and AGR (San Francisco Bay Regional Water Quality Control Board, 2019). Additional information on these beneficial uses for groundwater resources is provided in Section 2.2.1, *Hydrology and Floodplain*.

Depth to groundwater is anticipated to be approximately 26 feet below the existing surface; however, it is expected that groundwater levels will vary with time due to seasonal groundwater fluctuation, surface and subsurface flows, ground surface run-off, change in the water levels of nearby creeks, and other environmental factors. In addition, there are several drinking water reservoirs or recharge facility areas within Contra Costa County, per the *Caltrans District 4 Stormwater Management Program Work Plan* (California Department of Transportation, 2021b).

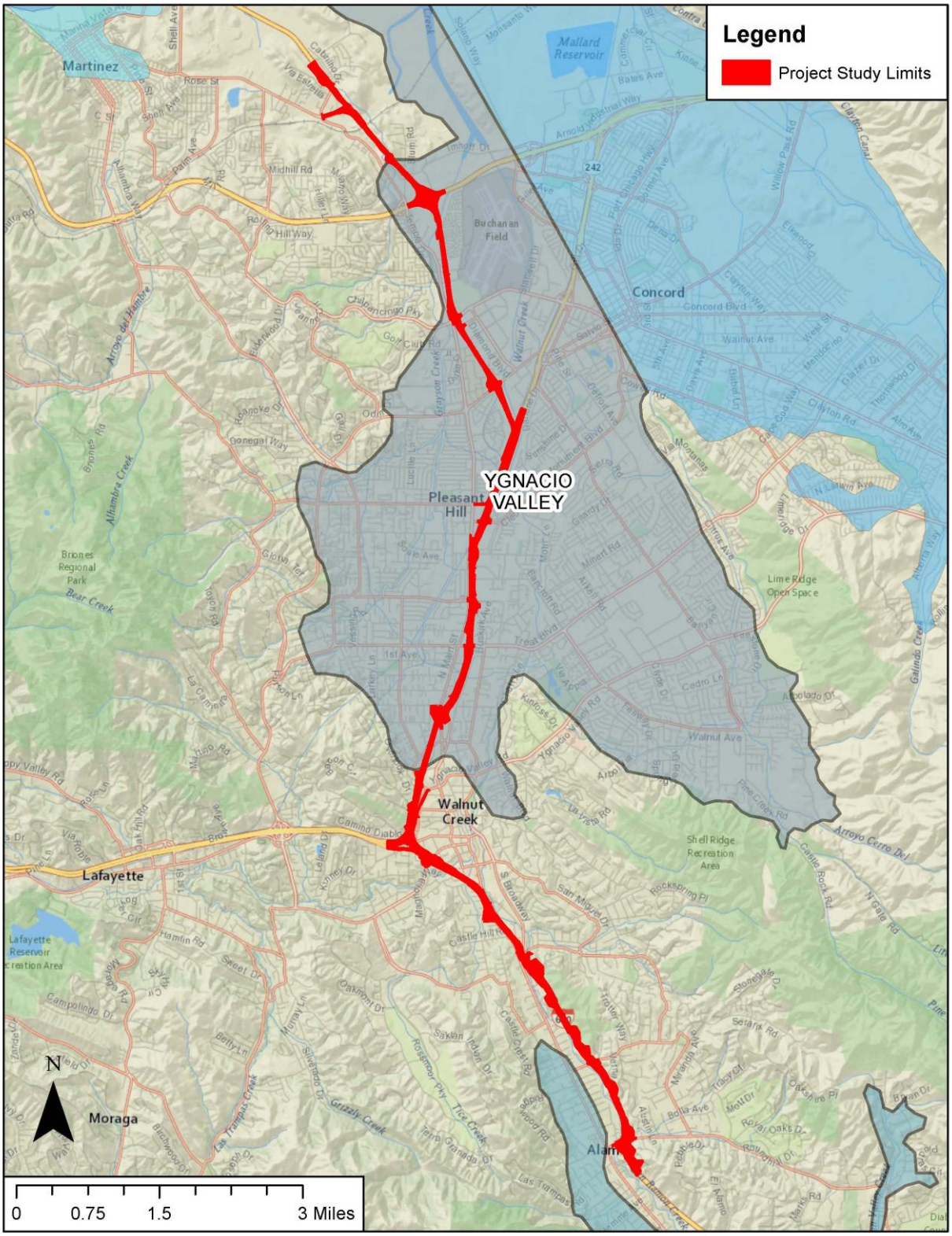


Figure 2.2.2-2. Groundwater Basins

2.2.2.3 Environmental Consequences

No-Build Alternative

The No-Build Alternative would maintain the current configurations of I-680 in the Project Study Limits. Under the No-Build Alternative, the proposed Project would not be constructed, and no impacts to water quality would occur.

Build Alternatives (Alternatives 1C, 2, 3, and 5)

Construction Impacts on Water Quality

Temporary construction impacts to water quality have the potential to occur during demolition and roadway construction activities related to the Project. The total Disturbed Soil Area (DSA) for the Project is 30.83 acres under Alternative 1C, 24.41 acres under Alternative 2 (preferred alternative), 37.24 acres under Alternative 3, and 10.65 acres under Alternative 5. Temporary water quality impacts could result from sediment discharge from DSAs and construction activities, such as demolition, grading, cut-and-fill, and excavation activities. Construction activities would result in exposed soil, increasing the potential for soil erosion and impacts on water quality. Soil erosion could also occur at an accelerated rate during a storm event. Construction equipment and employee vehicles could also inadvertently track sediment from the Project site onto adjacent roadways, which could potentially be conveyed to stormwater drainage systems. Other pollutants that could impact water quality during construction activities include sediment, metals, trash, concrete waste (dry and wet), sanitary waste, and chemicals, including gasoline, oils, grease, solvents, lubricants, and other petroleum products.

Avoidance and minimization measures, such as implementation of erosion and sediment control BMPs during construction, would prevent sediment and suspended solids from entering surface waters or minimize the amount of sediment and suspended solids. In addition, implementation of non-stormwater management and material management BMPs during construction would prevent chemical pollutants, such as concrete waste, from entering surface waters or minimize the amount of chemical pollutants. These BMPs would involve keeping a clean, orderly construction site. Non-stormwater management BMPs are source-control BMPs that prevent pollution by limiting or reducing potential pollutants at their source or eliminating off-site discharges. Non-stormwater management BMPs also include procedures and practices that have been designed to minimize or eliminate the discharge of pollutants from vehicle and equipment cleaning, fueling, and maintenance operations to stormwater drainage systems or watercourses. Further, waste management BMPs consist of implementing procedural and structural BMPs for handling, storing, and disposing wastes generated by a construction project to prevent the release of waste materials into stormwater runoff or discharges. These BMPs are intended to prevent the release of pollutants during stormwater and non-stormwater discharges.

The Construction General Permit separates projects into Risk Levels 1, 2, or 3. The Risk Level for this Project under all Build Alternatives was determined to be Risk

Level 3. Therefore, in addition to implementation of standard BMPs, Risk Level 3 projects are also required to comply with Numeric Action Level effluent limits for pH and turbidity and monitoring of receiving waters for pH and turbidity.

The Project would implement Measure **WQ-1**, which requires compliance with the requirements as stated in the Caltrans NPDES Statewide Storm Water Permit, and Measure **WQ-2**, which would include preparation of a SWPPP and implementation of erosion and sediment control BMPs, Numeric Action Level effluent limits, and receiving water monitoring triggers for pH and turbidity that would be detailed in the SWPPP during construction. With the implementation of Measures **WQ-1** and **WQ-2**, the potential for construction-related surface water pollution would be reduced and water quality in San Ramon Creek at Livorna Road, San Ramon Creek at Rudgear Road, Tice Creek, Las Trampas Creek, Walnut Creek, Grayson Creek, Pacheco Creek, Peyton Slough, and Suisun Bay would not be compromised by erosion, sedimentation, or chemical pollutants during construction.

Dewatering

Although the Project proposes bridge widening over Contra Costa Canal and San Ramon Creek, there is no proposed work within the concrete-lined channels. All work, including the construction of the proposed bridge columns, would be performed adjacent to the concrete-lined channels. The proposed Project is not anticipated to impact reservoirs or recharge facilities. Additionally, the proposed Project anticipates using the wet method for any pile driving construction activities, which would not require dewatering. Therefore, dewatering and temporary creek diversions would not be needed.

Wetlands and Other Waters

It is anticipated that up to approximately 0.26 acre of wetlands/waters could be impacted by the Project, which would be verified during final design. Information on impacts to jurisdictional resources and required regulatory permits from USACE (Section 404), the San Francisco Bay RWQCB (Section 401), and California Department of Fish and Wildlife (1602 Streambed Alteration Agreement), is discussed in Section 1.5, *Permits and Approvals Needed*, and Section 2.3.2, *Wetlands and Other Waters*.

Based on the above discussion regarding construction impacts on water quality, dewatering, and wetlands and other waters, no substantial temporary adverse direct or indirect impacts on water quality are anticipated to occur under the Build Alternatives with the implementation of Measures **WQ-1** and **WQ-2**.

Permanent Impacts on Water Quality

The proposed Project would result in a permanent increase in impervious surface area of 12.84 acres under Alternative 1C, 9.06 acres under Alternative 2 (preferred alternative), 16.27 acres under Alternative 3, and 2.93 acres under Alternative 5. The additional impervious surface area would increase the runoff from I-680 within the

Project Study Limits. This increase in impervious area would increase peak flows and runoff volumes, increasing the potential for erosion, sediment, and pollution in surface waters. Pollutants in runoff from the new impervious surface (NIS) areas include sediment, oils and grease, and metals, similar to the contaminants within the Project Study Limits from the existing I-680 configuration. Substantial amounts of additional pollutants in stormwater runoff could contribute to a violation of water quality standards. However, the Project would include upgrading existing drainage facilities and incorporating on-site treatment areas to manage the increase in runoff. In addition, the Project would implement Measure **WQ-3**, which would require the inclusion of design pollution prevention BMPs to avoid or minimize potential impacts on water quality by preventing downstream erosion and permanently stabilizing DSAs. Examples of these design pollution prevention BMPs would include preserving existing vegetation, slope/surface protection systems, permanent erosion control measures, and concentrated flow conveyance systems, which are described below.

The post-construction treatment goal for the Project is to fully treat 24.73 acres of NIS. Potential BMP areas are identified in Appendix I.1, *Project Feature Figures and Impact Maps*. Due to direction from Caltrans to avoid sensitive habitat in the northern portion of the Project Study Limits, the current design BMPs collectively have a total treatment area of 21.73 acres. Alternatives 1C, 2, and 5 would include post construction treatment areas that fully account for all NIS. Meanwhile, Alternative 3 would result in a total stormwater treatment deficit of 3.71 acres.

Design Pollution Prevention Best Management Practices

Preservation of Existing Vegetation

Existing, mature vegetation and landscaping within the Project Study Limits would be protected in place, where possible. Areas of clearing and grubbing would be limited to those areas impacted by new construction. Existing vegetation to be preserved, wetlands, and other environmentally sensitive areas would be preserved during construction using temporary, high-visibility fencing. Environmentally sensitive area (ESA) fencing locations would be identified during the design phase.

Slope/Surface Protection Systems

The Project would be constructed to minimize erosion by disturbing slopes only when necessary, minimizing cut-and-fill areas to reduce slope lengths, providing cut-and-fill slopes flat enough to allow revegetation to limit erosion rates, and providing concentrated flow conveyance systems consisting of storm drains, ditches, and gutters. The grading design and details would be developed during the design phase.

Replacement landscaping and vegetation for slope stabilization would be placed wherever existing landscaping is disturbed. Vegetation would be accompanied by mulch and fiber rolls, where necessary.

Permanent Erosion Control Measures

Permanent erosion control measures would be implemented on all areas disturbed by construction. These measures may consist of hydroseeding, hydromulch, fiber rolls, and netting. The need for hard surface erosion control measures would be determined during the design phase and would likely include rock slope protection energy dissipation devices at culvert outlets and possible ditch lining if concentrated flow velocities result in slope erosion.

Concentrated Flow Conveyance System

Runoff from the proposed improvements would be routed through on-site drainage systems consisting of culverts, ditches, and stormwater treatment measures. A total of 39 drainage culverts would be replaced and one potential drainage culvert could be rehabilitated. Concentrated flow conveyance systems would be implemented to prevent channelizing, gullying, and scouring of the surrounding slopes. Flared-end sections with rock slope protection would be placed at culvert outfalls to avoid or minimize slope or ditch erosion. Ditches or treatment measures would be placed to convey roadway runoff to existing crossings or creeks. These drainage ditches or treatment measures would be applied with hydroseed materials to promote vegetation establishment. The specific type and details of the proposed drainage facilities and erosion control measures would be identified during the design phase.

The proposed Project would result in 19.39 acres of NIS under Alternative 1C, 11.33 acres of NIS under Alternative 2 (preferred alternative), 23.05 acres of NIS under Alternative 3, and 5.83 acres of NIS under Alternative 5. Treatment BMPs within Caltrans right-of-way would be required since the proposed Project would add 1 or more acre of NIS under all Build Alternatives. Treatment BMPs are permanent measures to improve stormwater quality after construction is completed. Treatment BMPs (Measure **WQ-4**) considered for the Project include infiltration devices, biofiltration devices, detention devices, media filters, and Gross Solids Removal Devices (trash capture devices), which are discussed below.

Treatment Best Management Practices

Infiltration Devices

Infiltration devices allow for pollutant removal or reduction by infiltrating stormwater directly into the soil. Most soils within the Project Study Limits are in Hydrologic Soil Groups (HSG) C and D, specifically Clear Lake clay (classified as HSG C) and Tierra loam (classified as HSG D), which have slow to very slow infiltration rates and high runoff potential. Approaches designed to infiltrate stormwater into the surface may include amending existing soils or using engineered soil media to increase the infiltration potential of the proposed treatment BMPs. The use and design of infiltration devices would be investigated during the design phase.

Biofiltration Devices

Biofiltration devices, such as biofiltration swales, are feasible for this Project because site conditions allow for vegetation establishment. Biofiltration swales would be designed for bioretention. Retention can be achieved through the use of an engineered soil mix and an underdrain system. Bioretention devices would also promote vegetation growth, which contributes to water evapotranspiration. The use of bioretention devices allows for pollutant removal or reduction while reducing stormwater runoff flow rates and velocities. The use and design of bioretention devices would be investigated during the design phase.

Detention Devices

Detention basins allow for treatment by temporarily detaining runoff during storms. Detention devices are feasible for the Project, but detention devices may not meet the top priorities outlined by the Caltrans NPDES permit for providing stormwater treatment, as they do not promote infiltration or noticeable evapotranspiration. However, detention devices could possibly be used for harvesting and re-use purposes. The design feasibility of detention devices would be further investigated during the design phase.

Media Filters

Media filters allow for the removal or reduction of total suspended solid pollutants (sediments and metals), dissolved metals, litter, and potentially some nutrients from runoff by sedimentation and filtering. Austin sand filters are feasible for the Project and could be placed in ramp loop areas where there is adequate space to place a device. However, Austin sand filters may not meet the top priorities outlined by the Caltrans NPDES permit for providing stormwater treatment, as they do not promote infiltration or evapotranspiration. The design feasibility of Austin sand filters would be further investigated during the design phase.

Gross Solids Removal Devices

The Project would be required to implement trash-control measures per *San Francisco Bay RWQCB (Region 2) Cease and Desist Order on the Prohibition of Trash*. The San Francisco Bay RWQCB also states that Caltrans District 4 projects must implement trash control measures for all hotspot locations with waterbodies that discharge to the San Francisco Bay. Per the Caltrans District 4 Regional Board 2 Trash Generation Map website, the Project is designated as having moderate trash generation areas; therefore, the Project is required to implement trash capture devices along the moderate portions along I-680 (California Department of Transportation, 2021a). In addition, Gross solids removal devices (GSRD) should be considered for discharges to Grayson Creek because the creek is listed on the 303(d) list as being impaired for trash and because the Project is subject to Provision E.6, Region Specific Requirements, of the Caltrans NPDES Permit. The use of trash capture devices allows for trash removal or reduction to comply with the trash TMDL for Grayson Creek. The design feasibility of other approved trash capture devices, including trash nets placed at culvert outfalls or within other treatment BMPs, will be evaluated further during the design phase.

With the implementation of design pollution prevention BMPs and treatment control BMPs, specified in Measures **WQ-3** and **WQ-4**, no substantial adverse permanent direct or indirect impacts on water quality are anticipated to occur under the Build Alternatives.

2.2.2.4 Summary

*Alternative 2 has been selected as the preferred alternative. The construction contractor would be required to comply with Caltrans NPDES permits (**WQ-1**) and prepare a SWPPP (**WQ-2**) prior to ground and vegetation disturbing activities. The Project would not have a post-construction treatment deficit, and off-site alternative compliance stormwater treatment credit is not anticipated to be required. Measures **WQ-3** and **WQ-4** would be implemented requiring additional analysis during final design to further define treatment BMPs. Therefore, Alternative 2 would not adversely affect water quality.*

2.2.2.5 Avoidance, Minimization, and/or Mitigation Measures

WQ-1 During construction, the Resident Engineer or designated contractor will ensure the Project complies with the provisions of the Caltrans NPDES Statewide Storm Water Permit and the NPDES General Permit for Storm Water Discharges of Stormwater Runoff Associated with Construction Activities in effect at the time of construction.

WQ-2 Prior to construction, a SWPPP will be prepared and implemented to address all construction-related activities, equipment, and materials that have the potential to impact water quality. The SWPPP will identify the sources of pollutants that may affect the quality of stormwater and include the construction site BMPs to control pollutants such as sediment control, drainage inlet protection, construction materials management, and non-stormwater BMPs. Additional BMP reference material is contained within the Project Planning and Design Guide (California Department of Transportation, 2019) and Construction Manual (California Department of Transportation). These include, but are not limited to, temporary sediment control, temporary soil stabilization, scheduling, waste management, materials handling, and other non-stormwater BMPs.

WQ-3 During the design phase, the Design Engineer will ensure Caltrans-approved design pollution prevention BMPs for the Project will be further investigated. Design pollution prevention BMPs may include preservation of existing vegetation, slope/surface protection systems, and permanent erosion control measures (e.g., hydroseeding, hydromulch, fiber rolls, and netting).

WQ-4 Potential post-construction treatment BMPs have been identified. During the design phase, the Design Engineer will ensure Caltrans-approved treatment BMPs will be further investigated and be consistent with the requirements of the NPDES Permit and Waste Discharge Requirements for the State of California, Department of Transportation in effect at the time of design.

Treatment BMPs may include infiltration devices, biofiltration devices, detention devices, media filters, and GSRD (e.g., trash capture devices).

2.2.3 Geology/Soils/Seismic/Topography

2.2.3.1 Regulatory Setting

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 the California Environmental Quality Act (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 Caltrans' 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 Caltrans' Division of Engineering Services, Office of Earthquake Engineering, Seismic Design Criteria.

2.2.3.2 Affected Environment

The following discussion is based on the proposed Project's *Preliminary Geotechnical Design Report* (PGDR) (Parikh Consultants, Inc., 2022). The Geological Resource Study Area (RSA) is based on the prior Project Study Limits (post mile [PM] R4.4 to PM 24.5; Figure 1-10).

Geology

The Geological RSA is located in the geologically complex and seismically active Coast Ranges Geomorphic Province and consist primarily of artificial fill, stream deposits, alluvial fan deposits, alluvials, sandstone, siltstone, and shale.

The main geologic structures in relation to the Geological RSA are the Concord and Northern Calaveras faults. Bedrock in the northern area of the RSA, north of the Interstate 680 (I-680)/State Route (SR) 4 Interchange, generally dips moderately to the southwest. Bedrock south of the Ygnacio Valley Road Undercrossing to the southern end of the RSA generally dips moderately to steeply to the east and northeast.

Topography and Surface Conditions

The Geological RSA's topography varies from undulating within the San Ramon Valley in the southern half to relatively flat in the northern half. The main drainages located in the RSA are the San Ramon Creek in the southern section and Las Trampas Creek in the central section, both of which merge to form Walnut Creek in the northern section.

According to the PGDR, urbanization and development of transport infrastructure began in earnest during the 1950s, prior to which the majority of the Geological RSA was used

for agriculture. The City of Walnut Creek existed prior to the construction of I-680 and SR-24.

Soil Conditions

Topsoils

The Geological RSA was evaluated based on data from the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), and the Soil Survey Geographic Database for Contra Costa County, California (Parikh Consultants, Inc., 2022). Topsoils within the Geological RSA are comprised of variable amounts of cut and fill, clay, silty clay, clay loam, silty clay loam, and loam. These soils' potentials to corrode steel and concrete range from low to high, and their shrink-swell potentials range from low to very high.

Subsurface Conditions

Geotechnical test borings were conducted throughout the Geological RSA in preparation of the PGDR. The test borings revealed that subsurface soils within the RSA consisted primarily of variable amounts of soft to very stiff clay, lean clay, fat clay, clayey silt, clayey sand, sand, silt, silty sand, and gravel.

Expansive Soils

Expansive soil potential is the ability of some soils with high clay content to change volume with moisture content. Expansive soil potential poses a less significant hazard where soil moisture is relatively constant (either always wet or always dry). Expansive soil potential poses a significant hazard to sites that undergo seasonal variation in soil moisture content, such as on hillsides or flatlands with a seasonally fluctuating water table. Expansive soil potential maps show low to very high expansive potential along the Geological RSA.

Groundwater

As discussed in the PGDR, groundwater conditions within Geological RSA were assessed via geotechnical test borings drilled throughout the RSA. Groundwater throughout the RSA was encountered at ground surface elevations ranging from approximately 0.2 foot below sea level to 348 feet above sea level and averaging approximately 140 feet above sea level. Groundwater may vary due to seasonal groundwater fluctuation, sea level in the San Francisco Bay, subsurface flows or seepages, ground surface run-off, and other factors that may not have been present at the time of the PGDR's preparation.

Geologic Hazards

Seismic Hazards

The Geological RSA are located in one of the most seismically active areas in North America and are influenced mostly by the San Andreas fault system, which spans the Coast Ranges from the Pacific Ocean to the San Joaquin Valley. Figure 2.2.3-1 shows active faults in relation to the RSA.

Seismic Ground Shaking and Ground Surface Fault Ruptures

The closest active faults (less than 15,000 years) to the Geological RSA are the Concord and the Northern Calaveras faults, which are part of the San Andreas fault system. The Concord fault is a major right lateral strike-slip fault of the San Andreas fault system. The Northern Calaveras is part of the Calaveras fault zone, which is a major right lateral strike-slip fault of the San Andreas fault system and generally trends along the east side of the East Bay Hills.

Many earthquakes have resulted in significant shaking in the vicinity of Geological RSA, such as in San Francisco (magnitude 8.3, 1906) and in Loma Prieta (magnitude 7.1, 1989). As discussed below, primary seismic hazards include ground shaking and surface fault rupture. Secondary seismic effects resulting from soil responses to ground shaking include liquefaction. These hazards may cause deformation of man-made structures.

Earthquake-induced ground-shaking is a seismic hazard that can result in liquefaction, lurching, lateral spreading of soils, landslide of soil and rock, and the dynamic oscillation of man-made structures. Differential settlements can occur at the ground surface due to subsurface liquefaction and densification caused by strong ground-shaking.

As discussed in the PGDR (Parikh Consultants, Inc., 2022), the Project is not located within an Alquist-Priolo Earthquake Fault Zone. The closest earthquake fault zone to the Geological RSA is the Northern Calaveras, located approximately 500 feet southwest of the RSA's very southern end. The Northern Calaveras fault strikes roughly parallel to the southern end of the Geological RSA, with the closest section approximately 140 feet southwest of the RSA.

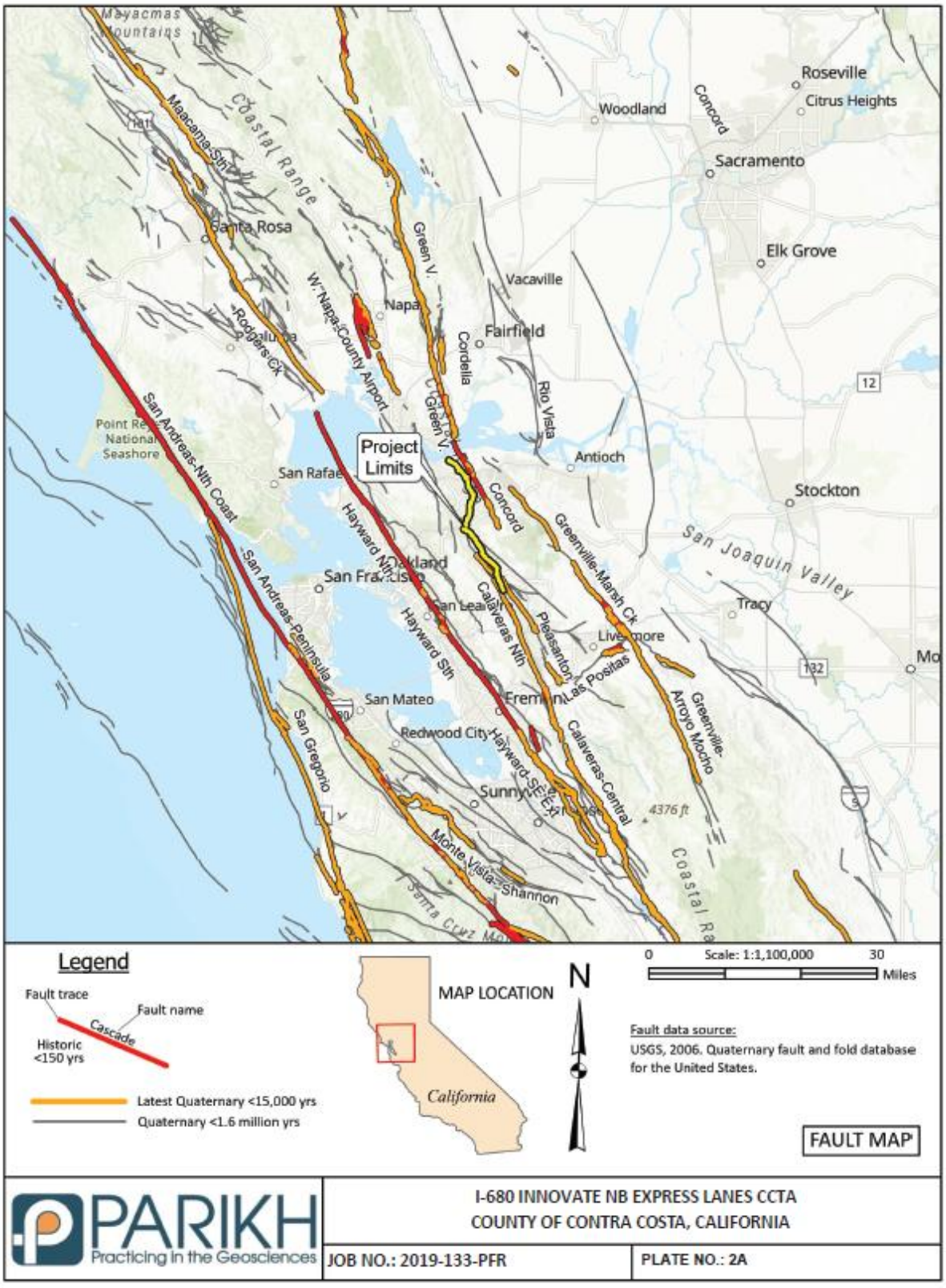


Figure 2.2.3-1. Fault Map with Geological Resource Study Area (Prior Project Study Limits)

Liquefaction and Lateral Spreading

Liquefaction is a phenomenon in which saturated, cohesionless soils are subject to a temporary but essentially total loss of shear strength under the reversing, cyclic shear stresses associated with earthquake shaking. Submerged cohesionless sands and silts of low relative density are the type of soils that usually are susceptible to liquefaction. Clays are generally not susceptible to liquefaction.

As discussed in the PGDR (Parikh Consultants, Inc., 2022), Liquefaction Susceptibility Maps indicate that the Geological RSA has low to moderate liquefaction potential. Liquefaction analyses based on available boring data indicate that liquefaction potential exists at some locations within the Geological RSA. There is the potential for permanent ground deformation of the approach embankments (i.e., lateral spreading) due to the presence of potentially liquefiable soils and soft Young Bay Mud, which is located at the northern end of the Geological RSA. In addition, the northbound Rudgear Road off-ramp, southbound Livorna Road off-ramp and on-ramp, and southbound Stone Valley Road off-ramp and on-ramp are located on very high liquefiable soil associated with San Ramon Creek.

Landslides

The most significant slopes and hillsides in and adjacent to the Geological RSA are cut slopes, each of which do not appear to show evidence of geologic hazards, such as landslide or slope failure, rockfall, or debris flow. However, a natural hillside to the west of the Geological RSA, between approximately 680 feet north of the northbound I-680 on-ramp from Diablo Road and 0.7 mile north of the northbound I-680 on-ramp from Crow Canyon Road, was identified in the Walnut Creek Special Studies Zone map as being an area of massive landslides, the toe of which appears to intersect with the base of the San Ramon Valley and I-680 (Parikh Consultants, Inc., 2022). Diablo Road and Crow Canyon Road are outside the current Project Study Limits.

Tsunamis and Seiches

A tsunami, or seismically generated sea wave, is generally created by a large, distant earthquake occurring near a deep ocean trough. A seiche is an earthquake-induced wave in a confined body of water, such as a lake or reservoir. According to the Department of Conservation's Contra Costa County Tsunami Hazard Areas Map (Department of Conservation, 2022), the Geological RSA is not located within any tsunami hazard areas. The northern-most point of the RSA is located approximately 560 feet from the nearest tsunami hazard area near the Carquinez Strait. In addition, there are no confined large bodies of water within the vicinity of the Geological RSA, such as a lake or reservoir. The Suisun Bay is located approximately 0.75 mile north of the RSA.

2.2.3.3 Environmental Consequences

No-Build Alternative

The No-Build Alternative would maintain the current configurations of I-680. Under the No-Build Alternative, the proposed Project would not be constructed, and no impacts on geology or soils would occur.

Build Alternatives (Alternatives 1C, 2, 3, and 5)

Temporary (Construction) Impacts

Temporary direct impacts on geology and soils under the Build Alternatives are related to construction-related ground disturbance activities in work areas, heavy equipment traffic areas, and material laydown areas. Temporary direct impacts on geology and soils would include soil compaction and increased potential for soil erosion due to soil exposure, when compared with existing conditions. Additionally, soil erosion could occur at an accelerated rate during a storm event. However, standard practices for erosion control and construction discharges would be part of the proposed Project for all Build Alternatives during construction, as described in Section 1.4.1.6, *Standardized Project Measures*, and detailed in Section 2.2.2, *Water Quality and Stormwater Runoff*. Since the Project would incorporate the Standardized Project Measures described above under all Build Alternatives, no substantial temporary direct impacts related to geology and soils would occur as a result of the proposed Project.

Construction activities associated with the proposed Project under all Build Alternatives could be affected indirectly by ground motion, liquefaction and lateral spreading, and potential ground deformation if an earthquake event were to occur during construction. However, the proposed Project would require implementation of Measure **HAZ-6**, described in Section 2.2.5, *Hazardous Waste/Materials*, which would ensure the development of a Health and Safety Plan that would prescribe safe construction practices, emergency response procedures, and safety training requirements to protect workers and the public during construction and minimize construction-related seismic hazards. Therefore, no substantial temporary indirect impacts related to geology and soils would occur under the Build Alternatives.

Permanent Impacts

Seismic Ground Shaking and Ground Surface Fault Ruptures

The Geological RSA is located within a seismically active region subject to future seismic ground shaking from earthquakes occurring along local or regional faults. As stated previously, the closest active faults (less than 15,000 years) to the Geological RSA are the Concord and the Northern Calaveras faults, which are part of the San Andreas fault system. Many earthquakes have resulted in significant shaking in the vicinity of the RSA, such as in San Francisco (magnitude 8.3, 1906) and in Loma Prieta (magnitude 7.1, 1989). Although seismic ground shaking can be expected near the RSA from nearby earthquake sources, the PGDR determined that surface fault rupture would

not contribute to the seismic hazards within the Geological RSA (Parikh Consultants, Inc., 2022).

Standard practices relating to Geotechnical Design Standards would be part of the proposed Project for all Build Alternatives, as described in Section 1.4.1.6, *Standardized Project Measures*. Under all Build Alternatives, the proposed Project would implement Measure **GEO-1**, which requires the preparation of a geotechnical report that would include geotechnical exploratory boring activities to confirm soil types and geologic conditions to address any potential impacts related to soils, liquefaction, and seismic activity during final design. Measure **GEO-1** includes recommendations in line with the Standardized Project Measures related to Geotechnical Design Standards, identified above. Under all Build Alternatives, the proposed Project would be designed and constructed based on the recommendations of the Geotechnical Design Report; in accordance with all applicable federal, State, and local seismic codes; and in accordance with Caltrans' seismic design criteria for structures. Therefore, with the incorporation of the Standardized Project Measures related to Geotechnical Design Standards and the implementation of Measure **GEO-1**, as well as compliance with seismic codes and design criteria for structures, no substantial permanent direct or indirect adverse impacts related to seismic ground shaking or ground surface fault ruptures are anticipated under any of the Build Alternatives.

Liquefaction and Lateral Spreading

As previously discussed, the Geological RSA has low to moderate liquefaction potential. Liquefaction analyses based on available boring data indicate that liquefaction potential exists at some locations within the RSA. Further, lateral spreading may be a design issue due to the presence of potentially liquefiable soils.

With the incorporation of the Standardized Project Measures related to Geotechnical Design Standards and the implementation of Measure **GEO-1**, the potential for liquefaction effects on the structures constructed under all Build Alternatives would be further investigated during final design. Under all Build Alternatives, the proposed Project would be designed and constructed based on the geotechnical report's recommendations, thereby minimizing impacts related to liquefaction and lateral spreading. Therefore, with the incorporation of the Standardized Project Measures related to Geotechnical Design Standards and the implementation of Measure **GEO-1**, as well as compliance with all applicable federal, State, and local seismic codes and design criteria for structures, no substantial permanent direct or indirect adverse impacts related to liquefaction and lateral spreading are anticipated under any of the Build Alternatives.

Landslides

The most significant slopes and hillsides within and adjacent to the Geological RSA are cut slopes, each of which do not appear to show evidence of geologic hazards, such as landslide or slope failure, rockfall, or debris flow. In accordance with Measure **GEO-1**, the potential for landslides and slope stability of the proposed Project's structures and embankments would be further investigated during final design. Under all Build Alternatives, the proposed Project would be designed and constructed based on the geotechnical report's recommendations, thereby minimizing potential impacts related to landslides. Therefore, with the incorporation of the Standardized Project Measures related to Geotechnical Design Standards and the implementation of Measure **GEO-1**, no substantial permanent direct or indirect adverse impacts related to landslides are anticipated under any of the Build Alternatives.

Compressible/Collapsible Soils

Strong ground motion during an earthquake would reduce the pore space between soil particles, and unsaturated granular soils tend to compress during dynamic shaking. Based on a review of available geotechnical data, subsurface soils within the Geological RSA consist primarily of variable amounts of soft to very stiff clay, lean clay, fat clay, clayey silt, clayey sand, sand, silt, silty sand, and gravel. These materials may be compressible and could undergo consolidation, which could damage proposed Project improvements under all Build Alternatives, including concrete structures and pavement. However, with the incorporation of the Standardized Project Measures related to Geotechnical Design Standards and the implementation of Measure **GEO-1**, the potential for subsurface soils to compress, collapse, or settle would be further investigated. Under all Build Alternatives, the proposed Project would be designed and constructed based on the geotechnical report's recommendations, thereby minimizing potential impacts related to compressible or collapsible soils. Therefore, with the incorporation of the Standardized Project Measures related to Geotechnical Design Standards and the implementation of Measure **GEO-1**, no substantial permanent direct or indirect adverse impacts related to compressible or collapsible soils are anticipated under and of the Build Alternatives.

Expansive Soils

Expansive soils generally result from specific clay minerals that have the capacity to shrink or swell in response to changes in moisture content. Sandy soils are generally not expansive. Expansive soils are characterized by their ability to undergo substantial volume change (shrink or swell) because of variations in moisture content. Changes in soil moisture content can result from rainfall, irrigation, pipeline leakage, surface drainage, perched groundwater, drought, or other factors. The change in volume of expansive soil may cause excessive cracking and heaving of structures with shallow foundations, concrete slabs, or pavements supported on these materials. The topsoils in the Geological RSA are comprised of variable amounts of cut and fill, clay, silty clay, clay loam, silty clay loam, and loam. These soils' shrink-swell potentials range from low to very high. However, under all Build Alternatives, the proposed Project would

incorporate the Standardized Project Measures related to Geotechnical Design Standards and implement Measure **GEO-1** during final design to further evaluate the potential for expansive soils. The proposed Project would be designed and constructed based on the geotechnical report's recommendations, thereby minimizing potential impacts related to expansive soils. Therefore, with the incorporation of the Standardized Project Measures related to Geotechnical Design Standards and the implementation of Measure **GEO-1**, no substantial permanent direct or indirect adverse impacts related to expansive soils are anticipated under any of the Build Alternatives.

Corrosive Soils

Topsoils within the Geological RSA are comprised of variable amounts of cut and fill, clay, silty clay, clay loam, silty clay loam, and loam. The potential for soil to corrode steel and concrete ranges from low to high. Corrosive soil could cause premature deterioration of buried conduits, foundations, and other buried concrete or metal improvements. Under all Build Alternatives, the proposed Project would incorporate the Standardized Project Measures related to Geotechnical Design Standards and implement Measure **GEO-1**, which requires that a Geotechnical Design Report be prepared during the design phase to evaluate the potential for soil corrosion effects on structures within the Project Study Limits. Thus, the proposed Project would be designed and constructed based on the geotechnical report's recommendations, thereby minimizing potential impacts related to corrosive soils. Therefore, with the incorporation of the Standardized Project Measures related to Geotechnical Design Standards and the implementation of Measure **GEO-1**, no substantial direct or indirect adverse impacts related to corrosive soils are anticipated under any of the Build Alternatives.

Tsunamis and Seiches

As discussed previously, the Geological RSA is not located within a tsunami hazard area. The northern-most point of the RSA was located approximately 560 feet to the nearest tsunami hazard area near the Carquinez Strait. The northern Project Study Limits are approximately 1.3 miles further south. In addition, there are no confined large bodies of water within the Geological RSA, such as a lake or reservoir. Therefore, no permanent direct or indirect adverse impacts from tsunamis or seiches are anticipated to occur under any of the Build Alternatives.

2.2.3.4 Summary

*Alternative 2 has been selected as the preferred alternative. Measure **GEO-1** would be implemented, which requires geotechnical investigations during final design. Geotechnical investigations would be conducted in accordance with Caltrans' Geotechnical Manual and would include field explorations and the preparation of Preliminary Foundation Reports. Therefore, Alternative 2 would not adversely affect geological resources. Although specific locations and depths of borings and/or cone penetration testing are unknown at this time, geotechnical earthwork would be limited to the impact areas depicted in Appendix I and would not exceed 120 feet below ground*

surface (or refusal). Different types of drill rigs are anticipated to be needed, such as truck-mounted, track-mounted, and portable rigs. Traffic control could also be required for explorations along highways and city streets. Where feasible, temporary lane closures would be limited to night shifts.

2.2.3.5 Avoidance, Minimization, and/or Mitigation Measures

Standard practices for erosion control and construction discharges would be implemented during construction as described in Section 2.2.2, *Water Quality and Stormwater Runoff*. Measure **HAZ-6**, in Section 2.2.5, *Hazardous Waste/Materials*, requires the preparation of a Health and Safety Plan. In addition, the following avoidance and minimization measure would be implemented:

GEO-1 Prior to completion of final design, the Design Engineer will ensure that a professional geologist or professional engineer prepare a design-level geotechnical report. Recommendations from the final design-level geotechnical report will be incorporated into the final Project plans and specifications during the final design phase to ensure the geotechnical stability of the Project. This report will document soil-related constraints and hazards, such as slope instability, settlement liquefaction, or related secondary seismic impacts, which may be present. The report will also include:

- Evaluation of expansive and potentially corrosive soils and recommendations regarding construction procedures and/or design criteria to reduce the effect of these soils on Project development,
- Identification of potential liquefiable areas within the Project Study Limits and recommendations for mitigation measures,
- Demonstration that the design of all proposed retaining walls is geotechnically suitable for soils within the Project Study Limits, and
- Geotechnical recommendations for the specific foundation design and earthwork construction considered for this Project.

2.2.4 Paleontology

2.2.4.1 Regulatory Setting

Paleontology is a natural science focused on the study of ancient animal and plant life as it is preserved in the geologic record as fossils.

A number of federal statutes specifically address paleontological resources, their treatment, and funding for mitigation as a part of federally authorized projects.

16 United States Code (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.

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.

Under California law, paleontological resources are protected by the California Environmental Quality Act (CEQA).

2.2.4.2 Affected Environment

The following discussion is derived from the proposed Project's *Paleontological Evaluation Report* (Paleo Solutions, Inc., 2021). The study area for paleontological resources is the Geological Resource Study Area (RSA), which is described in Section 2.2.3, *Geology/Soils/Seismic/Topography*.

The Geological RSA is situated within the Coast Range Geomorphic Province at the northern end of the southern Coast Range (Wallace, 1990; Oakeshott, 1966). A geomorphic province is a region of unique topography and geology that is readily distinguished from other regions based on its landforms and tectonic history.

As shown in Figure 2.2.4-1, the Geological RSA is underlain by Holocene-age alluvial pebble gravel, sand and clay of valley areas (Qa), Holocene-age bay mud (Qbm), Pleistocene-age dissected alluvial gravel and sands (Qoa), Pliocene- to late Miocene-age Orinda Formation (Tor), late Miocene-age Briones Sandstone (Tbr), late to middle Miocene-age Monterey Formation, sandstone (Tms), late to middle Miocene-age Monterey Formation, sandy clay shale/siltstone (Tmc), middle to early Eocene-age Meganos Formation (Tmg), and early Eocene- to Paleocene-age Martinez Formation marine clay shale to claystone (Tmz).

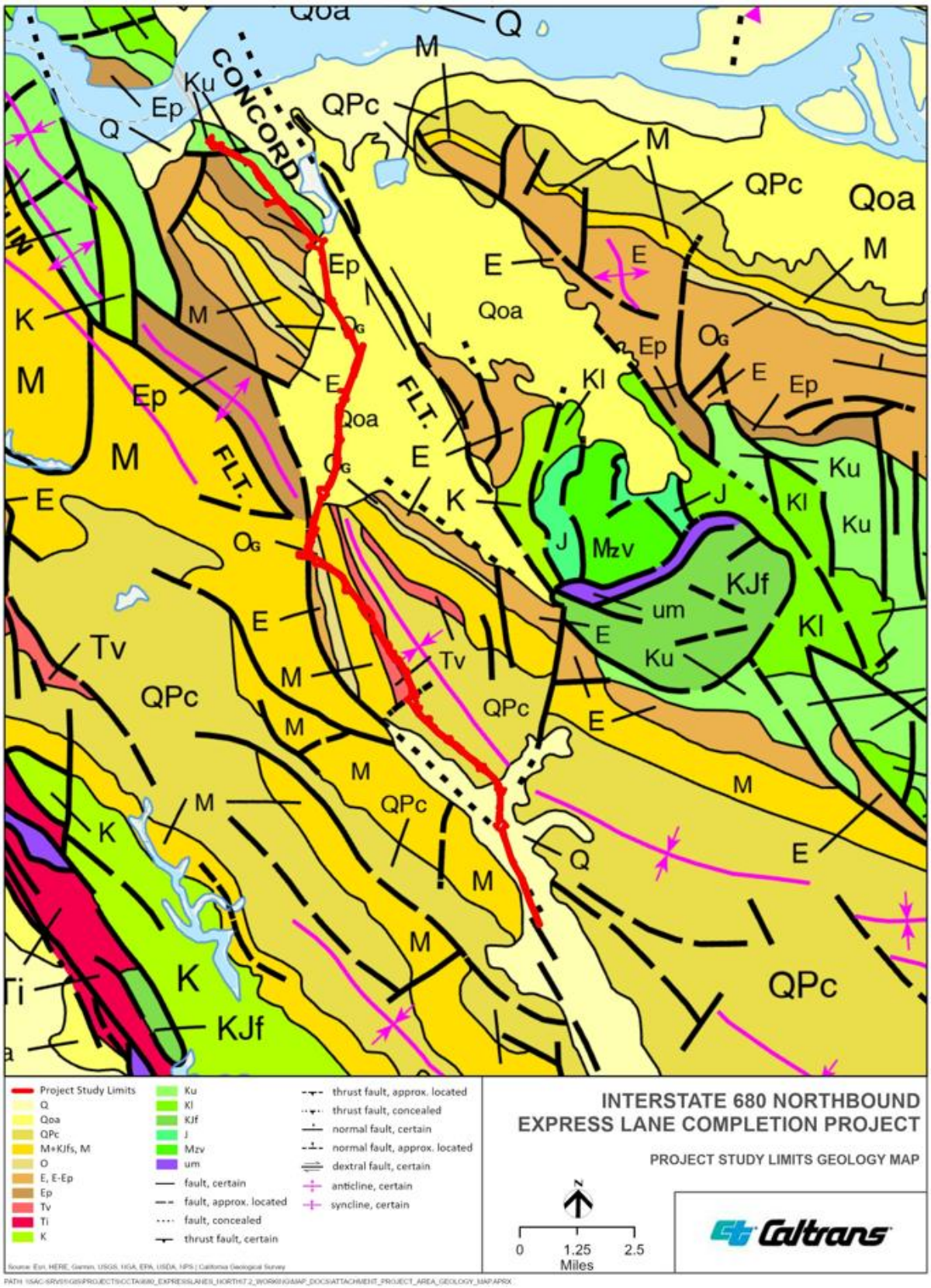


Figure 2.2.4-1. Geology Map

Additionally, recent artificial fill deposits (af), Miocene- to potentially Oligocene-age San Ramon Formation (Tsr), late Eocene-age Kreyenhagen Formation, Markley Sandstone member (TKm) and Nortonville Shale Member (TKn), middle Eocene-age Domengine Sandstone (Tds), early Eocene- to Paleocene-age Martinez Formation, marine sandstone (Tmzs), and late Cretaceous-age Panoche Formation (Kp, Kps) are mapped within the 0.25-mile buffer of the Geological RSA.

Field Survey

Paleontological literature reviews and online paleontological database searches of the University of California Museum of Paleontology's (UCMP) locality records were conducted. In addition, a field survey was conducted on October 7, 2020, reviewing the site geology along and around the Geological RSA while examining sediment exposures for the presence of paleontological resources. A single, possible shell or bone fragment was found in the Orinda Formation (Tor) along with indeterminate imprint in Briones Sandstone (Tbr). The observed fossils were in poor condition and lacked diagnostic characteristics. Therefore, they were non-significant discoveries; however, they demonstrate the paleontological potential of the Orinda Formation (Tor) and Briones Sandstone (Tbr) within the Geological RSA. No paleontological resources were collected during the survey.

Definition and Significance of Paleontological Resources

Fossils vary widely in their relative abundance and distribution, and not all are regarded as significant. The California Department of Transportation (Caltrans) defines scientifically significant paleontological resources as:

> "Sites or geologic deposits containing individual fossils or assemblages of fossils that are unique or unusual, diagnostically or stratigraphically important, and add to the existing body of knowledge in specific areas, stratigraphically, taxonomically, or regionally… Particularly important are fossils found in situ (undisturbed) in primary context (e.g., fossils that have not been subjected to disturbance subsequent to their burial and fossilization). As such, they aid in stratigraphic correlation, particularly those offering data for the interpretation of tectonic events, geomorphological evolution, paleoclimatology, the relationships between aquatic and terrestrial species, and evolution in general. Discovery of in situ fossil bearing deposits is rare for many species, especially vertebrates. Terrestrial vertebrate fossils are often assigned greater significance than other fossils because they are rarer than other types of fossils. This is primarily due to the fact that the best conditions for fossil preservation include little or no disturbance after death and quick burial in oxygen depleted, fine-grained, sediments. While these conditions often exist in marine settings, they are relatively rare in terrestrial settings (e.g., as a result of pyroclastic flows and flashflood events). This has ramifications on the amount of scientific study needed to adequately characterize an individual species and therefore affects how relative sensitivities are assigned to formations and rock units" (California Department of Transportation, 2014).

Vertebrate fossils, whether preserved remains or track ways, are classified as significant by most state and federal agencies and professional groups and are specifically protected under the California Public Resources Code. In some cases, fossils of plants or invertebrate animals are also considered significant and can provide important information about ancient local environments. Assessment of significance is also subject to the CEQA criterion that the resource constitutes a "unique paleontological resource or site."

The full significance of fossil specimens or fossil assemblages cannot be accurately predicted before they are collected, and in many cases, before they are prepared in the laboratory and compared with previously collected fossils. The pre-construction assessment of significance associated with an area or formation must be made based on previous finds, characteristics of the sediments, and other methods that can be used to determine paleoenvironmental and taphonomic conditions.

Determining Paleontological Sensitivity

Caltrans' paleontological sensitivity scale comprises the following three rankings: High Potential, Low Potential, and No Potential (California Department of Transportation, 2014). The scale generally correlates with the likelihood for a geologic unit to contain significant vertebrate, invertebrate, or plant fossils.

- High Potential – Rock units that, based on previous studies, contain or are likely to contain significant vertebrate, significant invertebrate, or significant plant fossils. These units include, but are not limited to, sedimentary formations that contain significant, nonrenewable paleontological resources anywhere within their geographical extent, and sedimentary rock units temporally or lithologically suitable for the preservation of fossils. These units may also include some volcanic and low-grade metamorphic rock units. Fossiliferous deposits with very limited geographic extent or an uncommon origin (e.g., tar pits and caves) are given special consideration and ranked as highly sensitive. High sensitivity includes the potential for containing: (1) abundant vertebrate fossils; (2) a few significant fossils (large or small vertebrate, invertebrate, or plant fossils) that may provide new and significant taxonomic, phylogenetic, ecologic, and/or stratigraphic data; (3) areas that may contain datable organic remains older than Recent, including Neotoma (sp.) middens; or (4) areas that may contain unique new vertebrate deposits, traces, and/or trackways. Areas with a high potential for containing significant paleontological resources require monitoring and mitigation.

- Low Potential – This category includes sedimentary rock units that: (1) are potentially fossiliferous but have not yielded significant fossils in the past; (2) have not yet yielded fossils but possess a potential for containing fossil remains; or (3) contain common and/or widespread invertebrate fossils if the taxonomy, phylogeny, and ecology of the species contained in the rock are well understood. Sedimentary rocks expected to contain vertebrate fossils are not placed in this category because vertebrates are generally rare and found

in more localized stratum. Rock units designated as low potential generally do not require monitoring and mitigation. However, as excavation for construction gets underway, it is possible that new and unanticipated paleontological resources might be encountered. If this occurs, a Construction Change Order must be prepared to have a qualified principal paleontologist evaluate the resource. If the resource is determined to be significant, monitoring and mitigation are required.

- No Potential – Rock units of intrusive igneous origin, most extrusive igneous rocks, and moderately to highly metamorphosed rocks are classified as having no potential for containing significant paleontological resources. For projects encountering only these types of rock units, paleontological resources can generally be eliminated as a concern when the Preliminary Environmental Analysis Report (PEAR) is prepared, and no further action would be taken (California Department of Transportation, 2014).

Significant vertebrate, invertebrate, and/or plant fossils have been recorded previously from the Pleistocene-age dissected alluvial gravel and sands (Qoa), Pliocene- to late Miocene-age Orinda Formation (Tor), late Miocene-age Briones Sandstone (Tbr), late to middle Miocene-age Monterey Formation (Tms, Tmc), Miocene- to potentially Oligocene-age San Ramon Formation (Tsr), late Eocene-age Kreyenhagen Formation (TKm, TKn), middle to early Eocene-age Meganos Formation (Tmg), early Eocene- to Paleocene-age Martinez Formation (Tmz, Tmzs), middle Eocene-age Domengine Sandstone (Tds), and late Cretaceous-age Panoche Formation (Kp, Kps). Therefore, based on Caltrans' guidelines, these geologic units have a high potential for producing significant paleontological resources (California Department of Transportation, 2014).

Fossils are generally not found in Holocene-age deposits, such as alluvial gravel, sand and clay of valley area (Qa), and bay mud (Qbm), due to their young age. In addition, any fossils discovered in artificial fill (af) have been removed from their original deposition locations and, therefore, lack critical stratigraphic contextual data. Therefore, using Caltrans' sensitivity system, the Holocene-age deposits (Qa, Qbm) and artificial fill (af) have low paleontological potential at the surface. However, these deposits may underlie older, more sensitive geologic units.

2.2.4.3 Environmental Consequences

No-Build Alternative

The No-Build Alternative would maintain the current configurations of I-680. Under the No-Build Alternative, the proposed Project would not be constructed, and no impacts on paleontological resources would occur.

Build Alternatives (Alternatives 1C, 2, 3, and 5)

Construction activities associated with all Build Alternatives have the potential to encounter native sediments with high paleontological potential, both at the surface and

in the subsurface beneath low sensitivity Holocene-age deposits (Qa, Qbm) and artificial fill (af). Excavations that encounter native Pleistocene-age dissected alluvial gravel and sands (Qoa), Pliocene- to late Miocene-age Orinda Formation (Tor), late Miocene-age Briones Sandstone (Tbr), late to middle Miocene-age Monterey Formation (Tms, Tmc), Miocene- to potentially Oligocene-age San Ramon Formation (Tsr), late Eocene-age Kreyenhagen Formation (TKm, TKn), middle to early Eocene-age Meganos Formation (Tmg), early Eocene- to Paleocene-age Martinez Formation (Tmz, Tmzs), middle Eocene-age Domengine Sandstone (Tds), and late Cretaceous-age Panoche Formation (Kp, Kps) have the potential to result in direct adverse effects on paleontological resources. Specifically, excavations related to installation of guardrails, electrical conduits, luminaire foundations, reader gantry foundations, overhead sign structure foundations, retaining walls, best management practices trash capture devices, and pavement have the potential to impact paleontologically sensitive sediments if excavations exceed the depths of artificial fill and/or Holocene-age deposits (Qa, Qbm).

Due to the potential for impacts to scientifically significant paleontological resources in the Geological RSA, a Paleontological Mitigation Plan would be prepared and included in the construction contract in accordance with Caltrans Standard Special Provision 14-7.04 and Measure **PAL-1**. The Paleontological Mitigation Plan would be prepared and implemented by or under the direct supervision of a qualified principal paleontologist. The plan would follow the guidelines in Standard Environmental Reference Vol. 1, Chapter 8 (Paleontology), as well as the Society of Vertebrate Paleontology standards. The plan would identify locations for mitigation based on the final design and further geotechnical data, which are prepared during the design phase. At this time, only spot-checking and/or monitoring of excavations that exceed depths of artificial fill and/or Holocene-age deposits (Qa, Qbm) at select locations is recommended. In the event of an unanticipated paleontological resource discovery during Project related activities, all work within 60 feet of the discovery would be halted until it can be evaluated by a qualified paleontologist in accordance with Caltrans Standard Specification 14-7.03, as described in Section 1.4.1.6, *Standardized Project Measures*.

2.2.4.4 Summary

*Alternative 2 has been selected as the preferred alternative. Measure **PAL-1**, requiring the preparation of a Paleontological Mitigation Plan during final design, would be implemented. The results of the geotechnical investigations, discussed in Section 2.2.3, Geology/Soils/Seismic/Topography, would aid in the development of the Paleontological Mitigation Plan. Therefore, Alternative 2 would not adversely affect paleontological resources.*

2.2.4.5 Avoidance, Minimization, and/or Mitigation Measures

PAL-1 **Paleontological Mitigation Plan.** Prepare a *Paleontological Mitigation Plan* once Project design is nearly complete. The final plan will be implemented during construction. Include a specification in the construction contract stating that paleontological monitoring will occur in

accordance with the *Paleontological Mitigation Plan*. Prepare a final report documenting the implementation of the approved *Paleontological Mitigation Plan* (i.e., Paleontological Mitigation Report). It is anticipated that the *Paleontological Mitigation Plan* would include the following measures:

- A Project-specific *Paleontological Mitigation Plan* will be prepared by a qualified principal paleontologist (MS or PhD in paleontology) once adequate Project design information regarding subsurface disturbance location, depth, and lateral extent is available.

- The qualified principal paleontologist will be present at pre-construction meetings to confer with contractors who will be performing ground-disturbing activities.

- Paleontological monitors, under the direction of the qualified principal paleontologist, will be on site to inspect cuts for fossils at all times during original ground disturbance involving sensitive geologic formations.

- When fossils are discovered, the paleontologist (or paleontological monitor) will recover them. Construction work in these areas may be halted or diverted by the Resident Engineer to allow the prompt recovery of fossils.

- Fossils collected during the monitoring and salvage portion of the mitigation program will be prepared to the point of identification, sorted, and cataloged.

- Prepared fossils, along with copies of all pertinent field notes, photos, and maps, will be deposited in a scientific institution with paleontological collections.

- A *Paleontological Mitigation Report* will be completed that outlines the results of the mitigation program.

- Where feasible, selected road cuts or large finished slopes in areas with critically interesting paleontological features may be left exposed to serve as important educational and scientific features. This may be possible if no substantial adverse visual or safety impacts result.

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2.2.5 Hazardous Waste/Materials

2.2.5.1 Regulatory Setting

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 of 1976 (RCRA). 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, Executive Order (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.

California regulates hazardous materials, waste, and substances under the authority of the CA 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.

2.2.5.2 Affected Environment

The following discussion is based on the proposed Project's *Phase I Initial Site Assessment* (ISA) (Parikh Consultants, Inc., 2022), which was completed in April 2022. The Phase I ISA was prepared in general accordance with the American Society for Testing and Materials (ASTM) International, Inc., *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process E1527-13* (ASTM Standard) and California Department of Transportation (Caltrans) ISA procedures. The study area for hazardous waste and materials is the Geological Resource Study Area (RSA), which is described in Section 2.2.3, *Geology/Soils/Seismic/Topography*.

The Phase I ISA was conducted to identify potential and known contaminant sources or recognized environmental conditions (REC), historical RECs (HREC), and controlled RECs (CREC) within the Geological RSA.

The following tasks were conducted as part of the Phase I ISA:

- **Environmental Database Review:** An environmental database search was conducted using Environmental Data Resources (EDR) to gather government database records dated February 23, 2021. The search consisted of reviewing existing federal, State, local, tribal, and EDR proprietary environmental databases, per the ASTM Standard. The environmental database search radius consisted of the Geological RSA and properties up to approximately 1 mile from the Geological RSA.

- **Historical Land Use Records Review:** Historical aerial photographs, topographic maps, and Sanborn fire insurance maps were reviewed.

- **Agency Records Review:** Caltrans historical record maps and work orders were reviewed to search for evidence of RECs. The record maps provide information on the location of historical underground storage tanks (USTs) and buildings. The maps were reviewed using the Caltrans D4 Maps on Demand website. The work orders provide information on hazardous spills and incidents and were obtained via a Caltrans Public Records Request. In addition, the National Pipeline Mapping System Public Viewer was reviewed, which provides information on hazardous liquid and gas transmission pipelines under the jurisdiction of the United States Department of Transportation (USDOT) Pipeline and Hazardous Materials Safety Administration.

- **Site Reconnaissance:** Site reconnaissance of the Geological RSA and adjacent roads was conducted on April 7 and May 7, 2021, to obtain information that may indicate the presence of potential RECs or adverse environmental conditions. Visual inspection was conducted from public right-of-way and from areas on properties that were publicly accessible. No interior building inspections were conducted.

The Phase I ISA was prepared in general accordance with ASTM Standards and Caltrans ISA procedures. The Phase I ISA does not meet "innocent landowner" provisions under CERCLA, which establishes a defense for the purchase of real property.

Sites of Concern

Based on the due diligence efforts completed as part of the Phase I ISA, three properties were identified to have RECs. Of the three properties, one is located within the Project Study Limits and two are located adjacent to the Project Study Limits. Table 2.2.5-1 lists each REC site and includes a description of the potential contamination issues that may have an impact on the proposed Project. The locations of the three REC sites are shown in Figure 2.2.5-1.

Table 2.2.5-1. Properties with Recognized Environmental Condition

Facility	Right-of-Way Acquisition	Possible Contamination
City of Walnut Creek Corporation Yard 511 Lawrence Way Walnut Creek, CA APN 173-014-005	Proposed partial acquisition	This property is currently operated by the City of Walnut Creek Corporation Yard. Corporation Yard supports the City's Public Works functions, including managing the City's entire fleet to repair streets and park infrastructure. Corporation Yard also serves as the central hub for the City's Departmental Operations Center, which provides emergency services for disaster response. It is an essential services facility used to store equipment, materials, and fuel used to respond to natural and human-caused disaster events. It also serves as a staging area for public safety deployments by the Walnut Creek Police Department, including the bomb squad. The property was used historically for agricultural purposes and may also have been occupied by Sacramento Northern Railway. The environmental database search identified the site as a LUST cleanup site, with the case being listed as case closed on April 14, 1995. Past Phase I and Phase II ESAs have been conducted on the property. The Phase I ESA concluded that pesticide and/or herbicide residues from past agricultural use may be present in onsite shallow soil. However, the potential for such residues to be present at concentrations that would pose regulatory or human health risk concerns is low. The Phase II ESA concluded that the site had been impacted by hydrocarbons and VOCs in the soil,

Facility	Right-of-Way Acquisition	Possible Contamination
		groundwater, and soil vapor from existing USTs, from the fuel dispenser area, and from a former waste oil UST. In addition, the Phase II ESA concluded that potential off-site migration of contamination from the former Siemens property, located at 480 Lawrence Way, may have resulted in potential groundwater and subsurface vapor impacts at the property. There is also a potential for off-site contamination migration from Diablo Pest Control, located at 1457 South O South Drive, to affect the property based its down-gradient location from Diablo Pest Control. Contamination at this property represents a REC. Existing site contamination from the City of Walnut Creek Corporation Yard property, and potential off-site migration of contamination from nearby properties at 480 Lawrence Way and Diablo Pest Control, have the potential to adversely impact the Project.
City of Walnut Creek Corporation Yard 470, 480, and 490 Lawrence Way Walnut Creek, CA APN 173-121-046 and 173-121-047	Non-acquisition	This property is located approximately 600 feet south of the Project's right-of-way acquisition area. This property was used historically for chemical manufacturing, recycling, and industrial waste treatment, and it also contained USTs. The environmental database search identified the site as a voluntary cleanup site. Confirmed contaminates of concern in groundwater at the property include benzene, petroleum hydrocarbons, and vinyl chloride. Remediation activities under consideration by DTSC include hot spot excavation and the introduction of a vapor barrier for the property. Contamination at this property represents a REC. There is a potential for off-site contamination migration from this property to adversely impact the Project.
Diablo Pest Control 1457 South O South Drive Walnut Creek, CA APN 171-202-002	Non-acquisition	This property is located approximately 300 feet west of the Project's right-of-way acquisition area. This property was formerly operated by Diablo Pest Control and was used to store pesticides, insecticides, and rodenticides. The environmental database search identified the site as a voluntary cleanup site. Potential and confirmed contaminants of concern at this property included arsenic, chlordane, and dieldrin. In 2012, DTSC certified that all remedial actions for known contamination at this property had been completed and no further action was recommended. Contamination at this property represents a HREC. There is a potential for off-site contamination migration from this property to adversely impact the Project.

Source: (Parikh Consultants, Inc., 2022)

Notes: APN = Assessor Parcel Number; DTSC = Department of Toxic Substances Control; HREC = historical recognized environmental condition; LUST = leaking underground storage tank; Phase I ESA = Phase I Environmental Site Assessment; Phase II ESA = Phase II Environmental Site Assessment; REC = recognized environmental condition; UST = underground storage tank; VOC = volatile organic compound

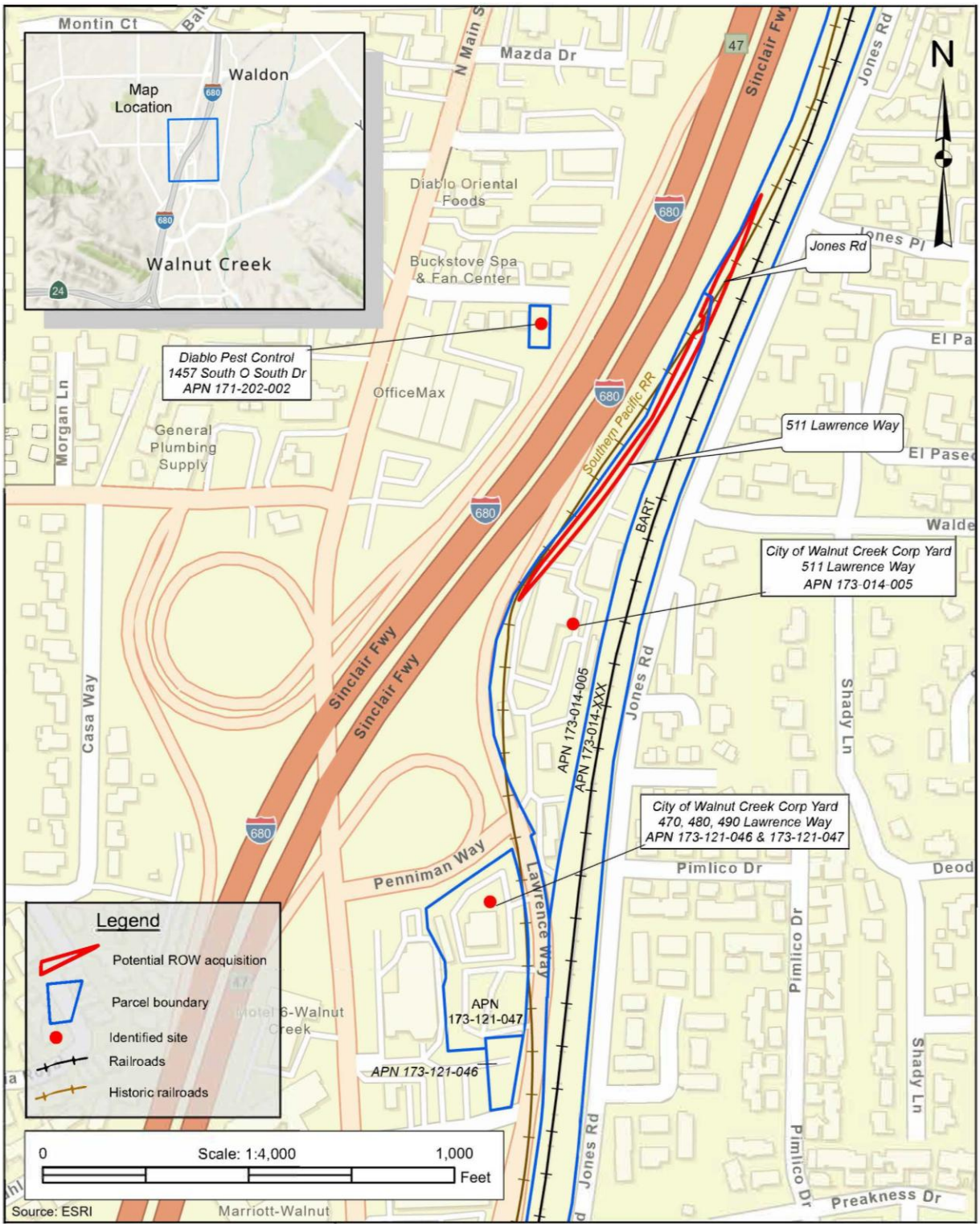


Figure 2.2.5-1. Potential Hazardous Waste/Materials Site

Other Conditions of Concern

Aerially Deposited Lead

Aerially deposited lead (ADL) is a byproduct of internal combustion engines burning lead containing fuels. Although the U.S. Environmental Protection Agency (U.S. EPA) began requiring unleaded gasoline in 1973, and leaded gasoline was phased out entirely by 1996 for automobiles, ADL is often found in undisturbed soil adjacent to historically trafficked highways and roads.

ADL concentration and distribution in soil depends on many variables, including traffic volumes and the roadway's age. Elevated lead concentrations can generally be found within approximately 6 feet of the edge of pavement and within the top 6 inches of soil. However, elevated lead concentrations can be present as deep as 2 to 3 feet below ground surface.

I-680 is a major traffic thoroughfare in Contra Costa County with construction beginning in the late 1950s. U.S. Geological Survey (USGS) topographic maps and historical aerial photographs show that roads within the Project Study Limits have supported vehicular traffic from the early 1900s. Due to vehicular activity, soils in the Project Study Limits are likely contaminated with ADL from cars burning leaded gasoline. Lead levels in surface soils along highways can reach concentrations in excess of the hazardous waste threshold, requiring either disposal at a Class I landfill or on-site stabilization.

Asbestos-Containing Material

Asbestos is a generic, commercial description for a group of naturally occurring mineral substances used in buildings and manufacturing because of their fire resistance. Asbestos is most hazardous when it is easily crumbled or reduced by hand ("friable"). Prior to 1978, asbestos was used commonly in building materials. Asbestos is still used in building materials today, though its use is uncommon due to the associated hazards. Asbestos-containing materials (ACM) include fireproofing, acoustic ceiling material, transite pipe, roofing materials, thermal insulation, support piers, expansion joint material in bridges, asphalt, concrete, and other building materials. ACM will typically not release asbestos fibers unless they are disturbed or damaged. There is a potential for ACM to be present in structures, including buildings and bridges, located within the Project Study Limits. In addition, there is a potential for ACM to be present along railroad tracks and railyards.

Lead-Based Paint

Regulations have restricted the use of lead in paints and primers and limited the use of paints in areas where consumers would have direct access to painted surfaces in non-industrial facilities. It is presumed that structures constructed prior to 1978 have lead-based paint (LBP). In addition, yellow paints made prior to 1995 may exceed hazardous waste criteria under Title 22 of the California Code of Regulations and

require disposal in a Class I disposal facility. There is a potential for structures, including buildings and bridges, located within the Project Study Limits to contain LBP.

Agricultural Land Uses

A large portion of the Project Study Limits was used for agriculture since at least the early 1900s, prior to industrialization and urbanization. Soils within the Project Study Limits may be contaminated with hazardous levels of pesticides and herbicides and with petroleum derived from equipment repair and maintenance, fuel storage, re-fueling, and cleaning activities.

Railroads

The historical Sacramento Northern Railroad and the San Ramon Branch of the Southern Pacific Railroad either crossed or ran alongside parts of the Project Study Limits. The Sacramento Northern Railroad ran along Olympic Boulevard and passed under I-680 at the Olympic Boulevard Undercrossing.

The Burlington Northern Santa Fe Railroad passed over the Project Study Limits at the East Martinez Underpass. Another historical railroad may also have crossed the Project Study Limits approximately 400 feet south of the East Martinez Underpass and ran on the same alignment as the Burlington Northern Santa Fe Railroad.

The Bay Area Rapid Transit (BART) Antioch-San Francisco International Airport line also crosses over the Project Study Limits and the Walnut Creek Overcrossing.

As discussed above, several portions of the Project Study Limits have been used historically, and are being used currently, for railroads. Therefore, there is the potential for soil and groundwater within the Project Study Limits to be impacted by several common railroad-related contaminants. Soil and/or groundwater contamination associated with railroads often includes polycyclic aromatic hydrocarbons (PAHs), asbestos, heavy metals, herbicides, and pesticides. The main source of PAHs in railroad areas derives from machine grease, fuel oils, transformer oils, creosote, and pentachlorophenol preserved railroad ties. Heavy metal contamination in soils in and around railroad areas is derived from construction materials, fuel combustion, cargo leakage, and the wearing of pantographs and associated electrical equipment. Herbicide and pesticide contamination in railroad areas arises from application to control weeds and pests for maintenance purposes.

Petroleum and Gas Transmission Pipelines

Existing pipeline safety regulations minimize the potential risks associated with future releases. However, these regulations do not remove the risk of undocumented petroleum releases that may have occurred in the past. Contaminants of concern from petroleum pipelines include gasoline, diesel, jet fuel, and polynuclear aromatic hydrocarbons.

The precise locations of pipelines would be determined during final design. According to the National Pipeline Management System Public Viewer (U.S. Department of Transportation, 2023), hazardous liquid and/or gas pipelines pass through or are adjacent to the Project Study Limits at multiple locations along I-680, including near Waterbird Regional Preserve, Pacheco Boulevard, State Route (SR) 4, Contra Costa Boulevard Ramp, Olympic Boulevard, and Rudgear Road.

Asphalt-Concrete and Portland Cement

Asphalt-concrete and Portland cement grindings have a relatively high pH and may contain metals and petroleum hydrocarbons that can impact stormwater runoff and threaten surface water quality.

Naturally Occurring Asbestos in Bedrock

Geologic mapping from USGS does not show any areas of rock likely to contain naturally occurring asbestos within the Project Study Limits (Van Gosen & Clickenbeard, 2011). There is ultramafic rock in outcrops and former asbestos prospects west of the Project Study Limits in the vicinity of Mount Diablo. Undocumented fill material in the Project corridor could potentially contain naturally occurring asbestos imported from other areas.

Treated-Wood Waste

The preservatives used to treat the wood can include one or more of the following constituents: arsenic, chromium, copper, pentachlorophenol, or creosote. When the treated wood has reached the end of its service life, it is regarded as treated-wood waste.

2.2.5.3 Environmental Consequences

No-Build Alternative

The No-Build Alternative would maintain the current configurations of I-680 in the Project Study Limits. Under the No-Build Alternative, the proposed Project would not be constructed, and no impacts on hazardous waste or materials would occur. Routine maintenance activities would be required to follow applicable federal and state regulations with respect to the use, storage, handling, transport, and disposal of potentially hazardous materials or waste.

Build Alternatives (Alternatives 1C, 2, 3, and 5)

Temporary Impacts

Project construction and maintenance activities are expected to involve the temporary use, storage, handling, transport, and disposal of typical construction hazardous materials (e.g., fuels, paints, asphalt, and lubricants). These materials could pose a threat to human health or the environment if not managed properly.

Federal and state agencies regulate the use, storage, handling, transport, and disposal of hazardous materials. All hazardous materials would be properly used, stored, handled, transported, and disposed of in compliance with all applicable regulations and requirements, which may include the RCRA, Clean Air Act, Clean Water Act, California Department of Toxic Substances Control (DTSC) Environmental Health Standards for the Management of Hazardous Waste, and USDOT hazardous materials regulations. Workers who handle hazardous materials must also follow OSHA and California Division of Occupational Safety and Health (Cal/OSHA) health and safety requirements. In addition, hazardous materials and waste must be transported in accordance with RCRA and USDOT regulations and disposed of at a facility that is permitted to accept the waste. Adherence to applicable federal and State regulations during project construction and maintenance is mandatory. These regulations reduce the risk of exposure to hazardous materials and accidental hazardous materials releases during construction and maintenance activities. Therefore, construction and maintenance activities are not expected to create a hazard to construction workers, the public, or the environment.

As described in more detail below, hazardous wastes and materials may be encountered during Project construction. Caltrans Standard Specifications and Standard Special Provisions, as well as Measures **HAZ-1** through **HAZ-6,** would be implemented, which would avoid or minimize adverse effects with known or suspected hazardous materials and wastes during construction.

Sites of Concern

The Phase I ISA identified three properties located either adjacent to or within the Project Study Limits, which are described above (Parikh Consultants, Inc., 2022). Potential contamination associated with these properties are due to existing and past land uses and operation activities, which may have resulted in a release or spill. Table 2.2.5-1 lists each site with the potential to impact the Project for all Build Alternatives and includes a description of the contamination issues (Figure 2.2.5-1 depicts site locations).

Alternatives 2, 3, and 5 would require a temporary construction easement and partial right-of-way acquisition of the City of Walnut Creek Corporation Yard (511 Lawrence Way, Walnut Creek, CA, APN 173-014-005). Contaminated soil and/or groundwater may be encountered during construction activities. Implementation of Measure **HAZ-1** would require that a Preliminary Site Investigation (PSI) be conducted for this property to further assess it for contamination issues. With the implementation of Measure **HAZ-1**, impacts would not be substantial.

Aerially Deposited Lead

ADL from the historical use of leaded gasoline, exists along roadways throughout California. There is the likely presence of soils with elevated concentrations of lead as a result of ADL on the state highway system right-of-way within the limits of the project alternatives. Soil determined to contain ADL contamination exceeding California

hazardous waste thresholds would be managed in accordance with the July 1, 2016, ADL Agreement between Caltrans and the California DTSC (Department of Toxic Substance Control 2016). This ADL Agreement allows such soils to be reused safely within the Project Study Limits, as long as all requirements of the ADL Agreement are met. Otherwise, ADL-contaminated soil would require either disposal at either a Class I landfill or on-site stabilization.

The proposed Project may encounter ADL contaminated soils during construction under all Build Alternatives. As identified in Measure **HAZ-2**, unpaved soils adjacent to the existing roadway should be tested for ADL according to Caltrans ADL testing guidelines. If ADL concentrations are detected in existing soils, such soils would be handled in accordance with Caltrans Standard Specification, Section 14-11.08, Regulated Material Containing Aerially Deposited Lead (2022), and under the July 1, 2016, ADL Agreement between Caltrans and California DTSC. With the implementation of Measure **HAZ-2**, impacts would not be substantial.

Asbestos-Containing Material and Lead-Based Paint

Structures, including buildings and bridges, within the Project Study Limits may potentially contain ACM and LBP. The proposed Project would require bridge widening and reconstruction work under all Build Alternatives. These structures may have materials that contain ACM and LBP. As identified in Measure **HAZ-3,** prior to any disturbance or demolition activities associated with the structures, the presence or absence of ACM and LBP in the structure would need to be confirmed.

The modification or removal of ACM in bridges would be conducted in accordance with the U.S. EPA's National Emissions Standards for Hazardous Air Pollutants (40 CFR Part 61), Bay Area Air Quality Management District regulations, and Caltrans Standard Specifications Section 14-11.16, Asbestos-Containing Construction Materials in Bridges (2022). The modification or removal of LBP in bridges would be conducted in accordance with Caltrans Standard Specifications Section 14-11.13, Disturbance of Existing Paint Systems on Bridges. With the implementation of Measure **HAZ-3**, impacts would not be substantial.

Agricultural Land Uses

Soils within the Project Study Limits that have not been previously disturbed may contain residual pesticides, herbicides, and petroleum from historical agricultural uses and associated activities. Therefore, there is a potential for the proposed Project to encounter soil contamination from historical agricultural uses during construction under all Build Alternatives. Undisturbed soil on historic agricultural land that may be disturbed by the proposed Project will be sampled for pesticides, herbicides, and petroleum, as identified in Measure **HAZ-4**. With the implementation of Measure **HAZ-4**, as identified in Section 2.2.5.4, *Avoidance, Minimization, and/or Mitigation Measures,* impacts would not be substantial.

Railroad Land Uses

Historical and existing railroad land uses within the Project Study Limits may have resulted in soil and groundwater contamination from common railroad-related contaminants, including PAHs, asbestos, heavy metals, herbicides, and pesticides. There is a potential for the proposed Project to encounter soil and/or groundwater contamination from historical and existing railroad land uses during construction under all Build Alternatives. Historical and existing railroad land uses within the Project Study Limits that may be disturbed by the proposed Project would be sampled for common railroad-related contaminants, as identified in Measure **HAZ-5**. With the implementation of Measure **HAZ-5**, as identified in Section 2.2.5.4, *Avoidance, Minimization, and/or Mitigation Measures,* impacts would not be substantial.

Unknown Hazards

Because of existing and past land uses and the operational activities of facilities within and adjacent to the Project Study Limits, there is a potential for the proposed Project to encounter unknown hazards during construction under all Build Alternatives, such as soil and groundwater contamination and buried drums and underground tanks containing hazardous waste/materials. A Health and Safety Plan would be prepared prior to construction to protect worker health and safety and the environment, as identified in Measure **HAZ-6**. This plan will contain specific procedures for encountering expected and unexpected contaminants. It will prescribe safe work practices, contaminant monitoring, personal protective equipment, emergency response procedures, and safety training requirements. With the implementation of Measure **HAZ-6**, impacts would not be substantial.

Permanent Impacts

Routine maintenance activities would be required to follow applicable federal and State regulations with respect to the use, storage, handling, transport, and disposal of potentially hazardous materials.

2.2.5.4 Summary

*Alternative 2 has been selected as the preferred alternative. Measures **HAZ-1** through **HAZ-5**, requiring preliminary site investigations during final design, would be implemented. Site investigations would inform contractors of potential soil disposal and reuse options and potential worker health and safety concerns during soil disturbing activities, potential groundwater management options during dewatering, and potential hazardous building materials present in structures that would be demolished or modified during construction. In accordance with Measure **HAZ-6**, a Construction Health and Safety Plan would be prepared to guide all construction activities. As discussed above, Alternative 2 would not adversely affect hazardous waste or materials.*

2.2.5.5 Avoidance, Minimization, and/or Mitigation Measures

HAZ-1 **Preliminary Site Investigation**. During the design phase, Caltrans Office of Environmental Engineering will ensure that a Preliminary Site Investigation (PSI) is conducted at City of Walnut Creek Corporation Yard, 511 Lawrence Way, Walnut Creek, CA (Assessor Parcel Number 173-014-005) in the area that would be disturbed by the Project. The PSI would assess for the presence of site contamination, including hydrocarbons and volatile organic compounds in soil and groundwater.

HAZ-2 **Aerially Deposited Lead**. Soils located within Caltrans right-of-way (ROW) have the potential to contain aerially deposited lead (ADL). During the design phase, Caltrans Office of Environmental Engineering will ensure that soil sampling and analysis for ADL be conducted on Caltrans ROW (within the Project disturbance limits) that have not been previously characterized, to determine the proper handling and disposal requirements. Soil determined to contain lead concentrations exceeding stipulated thresholds must be managed in accordance with Caltrans Standard Specifications, Section 14-11.08 Regulated Material Containing Aerially Deposited Lead (2022) and under the July 1, 2016, ADL Agreement between Caltrans and the Department of Toxic Substances Control. This ADL Agreement allows such soils to be safely reused within the Project Study Limits, as long as all requirements of the ADL Agreement are met.

HAZ-3 **Asbestos-Containing Material (ACM) and Lead-Based Paint (LBP)**. Structures, including buildings and bridges, may contain ACM and LBP. During the design phase, Caltrans Office of Environmental Engineering will ensure that structures are sampled for ACM and LBP prior to any demolition or disturbance activities. Soils surrounding the structures that will be disturbed should also be sampled for ACM and LBP. In addition, Caltrans Office of Environmental Engineering will ensure that the survey is conducted in conformance with the United States Environmental Protection Agency National Emission Standards for Hazardous Air Pollutants 40 CFR, South Coast Air Quality Management District Rule 1403, and in accordance with Caltrans Standard Specifications, Section 14-11.13, Disturbance of Existing Paint Systems on Bridges, and Section 14-11.16, Asbestos-Containing Construction Materials in Bridges (2022).

HAZ-4 **Agricultural Land Uses**. Soils within the Project Study Limits that have not been previously disturbed may contain residual pesticides, herbicides, and petroleum from historical agricultural uses. During the design phase, the Caltrans Office of Environmental Engineering will ensure that undisturbed soil on historic agricultural land that may be disturbed by the proposed Project are sampled for pesticides, herbicides, and petroleum.

HAZ-5 **Railroad Land Uses.** Soil and groundwater within the Project Study Limits may be contaminated with common railroad-related contaminates, including polynuclear aromatic hydrocarbons, asbestos, heavy metals, herbicides, and pesticides, from existing and historical railroad uses. During the design phase, Caltrans Office of Environmental Engineering will ensure that soil and groundwater on historical and existing railroad land that may be disturbed by the proposed Project are sampled for common railroad-related contaminants.

HAZ-6 **Construction Health and Safety Plan**. Prior to construction, Caltrans Office of Environmental Engineering will ensure that a Health and Safety Plan is developed to guide all construction activities. A Certified Industrial Hygienist will review this plan, based on evaluations of proposed construction activities, the potential hazards identified in Project's *Phase I Initial Site Assessment* (Parikh Consultants, Inc., 2022), and any future assessment prepared for the Project. This plan will contain specific procedures for encountering expected and unexpected contaminants. It will prescribe safe work practices, contaminant monitoring, personal protective equipment, emergency response procedures, and safety training requirements to protect construction workers and third parties. The plan will meet the requirements of 29 CFR 1910 and 1926, and all other applicable federal, State, and local regulations and requirements. The designated contractor will be responsible for preparing the Health and Safety Plan before the start of construction.

It is estimated that site investigations and abatement would cost approximately $600,000 and take up to 12 months to complete. It is understood that if a PSI identifies site contamination, avoidance, minimization, and/or abatement measures would be determined at that time and property owners would be legally responsible for the cleanup of contamination on their private properties. If these PSIs determine that contamination is present that cannot be abated, measures to avoid the acquisition or temporary or permanent easement of the property may be implemented to avoid encountering the area of contamination during construction or maintenance activities. If acquisition limits cannot be adjusted, minimization measures may include indemnification, reduction in price, or acquisition as highway easement instead of in fee.

Acquisition of contaminated property must comply with applicable Caltrans directives, including the Caltrans Project Delivery Directive PD-02-R1. If contamination is present when property is to be transferred to Caltrans, the impact of this contamination must be evaluated, and the transfer may be contingent upon acceptance of liability by the Caltrans Chief Engineer.

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2.2.6 Air Quality

2.2.6.1 Regulatory Setting

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 United States Environmental Protection Agency (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 criteria pollutants that have been linked to potential health concerns: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter—which is broken down for regulatory purposes into particles of 10 micrometers or smaller (PM_{10}) and particles of 2.5 micrometers and smaller ($PM_{2.5}$), Lead (Pb), and sulfur dioxide (SO_2). In addition, state standards exist for visibility reducing particles, sulfates, hydrogen sulfide (H_2S), 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 National Environmental Policy Act (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 U.S. Department of Transportation (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 Code of Federal Regulations (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 carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), and in some areas (although not

in California), sulfur dioxide (SO_2). California has nonattainment or maintenance areas for all of these transportation-related "criteria pollutants," except SO_2, and also has a nonattainment area for lead (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 Regional Transportation Plans (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), Federal Highway Administration (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[1] that has not changed significantly from those in the RTP and TIP; project analyses have used the latest planning assumptions and EPA-approved emissions models; and in particulate matter 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 particulate matter nonattainment or maintenance areas to examine localized air quality impacts.

2.2.6.2 Affected Environment

The following discussion is from the proposed Project's *Air Quality Report* (Illingworth & Rodkin, Inc., 2024), which was completed in January 2024. Contra Costa County is within the San Francisco Bay Area Air Basin. The Bay Area Air Quality Management District (BAAQMD) regulates air quality in the San Francisco Bay Area Air Basin.

Climate, Meteorology, and Topography

Meteorology (weather) and terrain can influence air quality. Certain weather parameters are highly correlated to air quality, including temperature, the amount of sunlight, and the type of winds at the surface and above the surface. Winds can transport ozone and ozone precursors (i.e., reactive organic gases [ROG]) from one region to another,

[1] "Design concept" means the type of facility that is proposed, such as a freeway or arterial highway. "Design scope" refers to those aspects of the project that would clearly affect capacity and thus any regional emissions analysis, such as the number of lanes and the length of the project.

contributing to air quality problems downwind of source regions. Furthermore, mountains can act as a barrier that prevents ozone from dispersing.

The National Weather Service's Buchanan Field climatological station, in Concord, California, is the most representative of meteorological conditions near the Project. This station is located adjacent to I-680 in Contra Costa County. The San Francisco Bay and coastal mountains have a substantial influence on the Project area's climate. The Project area's climate is generally Mediterranean in character, with cool winters (average 24-hour temperature of 50 Fahrenheit [ºF] in January) and warm, dry summers (average 24-hour temperature of 64ºF in July) (Illingworth & Rodkin, Inc., 2024). The prevailing winds in the Project area flow mainly from the south-southwest from off the San Francisco Bay (Iowa State University, 2022). The annual average rainfall is 16.2 inches at Buchanan Field, mainly falling during the winter months (Illingworth & Rodkin, Inc., 2024).

Criteria Pollutants and Attainment Status

The FCAA requires the U.S. Environmental Protection Agency (EPA) to set NAAQS for the following criteria air pollutants: O_3, CO, PM_{10}, $PM_{2.5}$, NO_2, Pb, SO_2. It also permits states to adopt additional or more protective air quality standards if needed. California has set standards for certain pollutants. Table 2.2.6-1 and Table 2.2.6-2 document the current air quality standards and summarize the sources and health effects of the criteria pollutants and pollutants regulated in the state of California.

Table 2.2.6-1. State and Federal Criteria Air Pollutant Standards and Status

Pollutant	Averaging Time	State Standard [i]	Federal Standard [ii]	State Project Attainment Status	Federal Project Area Attainment Status
O_3 [iii]	1 hour	0.09 ppm [iv]	N/A	Nonattainment	N/A
O_3	8 hours	0.070 ppm	0.070 ppm (4th highest in 3 years)	Nonattainment	Nonattainment
CO [v]	1 hour	20 ppm	35 ppm	Attainment	Attainment
CO	8 hours	9.0 ppm	9 ppm	Attainment	Attainment
CO	8 hours (Lake Tahoe)	6 ppm	N/A	N/A	N/A
PM_{10} [vi]	24 hours	50 µg/m^3 [vii]	150 µg/m^3 (expected number of days above standard < or equal to 1)	Nonattainment	Unclassified
PM_{10}	Annual	20 µg/m^3	N/A	Nonattainment	N/A
$PM_{2.5}$ [vii]	24 hours	N/A	35 µg/m^3	N/A	Nonattainment

Pollutant	Averaging Time	State Standard [i]	Federal Standard [ii]	State Project Attainment Status	Federal Project Area Attainment Status
$PM_{2.5}$	Annual	12 µg/m^3	12.0 µg/m^3	Nonattainment	Unclassified/ Attainment
NO_2	1 hour	0.18 ppm	0.100 ppm [ix]	Attainment	-
NO_2	Annual	0.030 ppm	0.053 ppm	-	Attainment
SO_2 [x]	1 hour	0.25 ppm	0.075 ppm (99th percentile over 3 years)	Attainment	-
SO_2	3 hours	N/A	0.5 ppm [xi]	N/A	-
SO_2	24 hours	0.04 ppm	0.14 ppm (for certain areas)	Attainment	-
SO_2	Annual	N/A	0.030 ppm (for certain areas)	N/A	-
Pb [xii]	Monthly	1.5 µg/m^3	N/A	-	N/A
Pb	Calendar Quarter	N/A	1.5 µg/m^3 (for certain areas)	N/A	Attainment
Pb	Rolling 3-month average	N/A	0.15 µg/m^3 [xiii]	N/A	Attainment
Sulfates	24 hours	25 µg/m^3	N/A	Attainment	N/A
H_2S	1 hour	0.03 ppm	N/A	Unclassified	N/A
Visibility Reducing Particles (VRP) [xiv]	8 hours	Visibility of 10 miles or more (Tahoe: 30 miles) at relative humidity less than 70%	N/A	Unclassified	N/A
Vinyl Chloride [xv]	24 hours	0.01 ppm	N/A	No Information Available	N/A

Source: (Bay Area Air Quality Management District, 2017)
Adapted from the California ARB Air Quality Standards chart
Notes: O_3 = ozone; CO = carbon monoxide; N/A = not applicable; PM_{10} = particles of 10 micrometers or smaller; $PM_{2.5}$ = particles of 2.5 micrometers or smaller; ppm = parts per million; NO_2 = nitrogen dioxide; SO_2 = sulfur dioxide; Pb = lead; H_2S = hydrogen sulfide; µg/m^3 = micrograms per cubic meter
Greenhouse Gases and Climate Change: Greenhouse gases do not have concentration standards for that purpose. Conformity requirements do not apply to greenhouse gases.

[i] California standards for ozone, carbon monoxide (except eight-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM10, PM2.5, and visibility reducing

Pollutant	Averaging Time	State Standard [i]	Federal Standard [ii]	State Project Attainment Status	Federal Project Area Attainment Status

particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[ii] Federal standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m3 is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current national policies.

[iii] On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm. Transportation conformity applies in newly designated nonattainment areas for the 2015 national eight-hour ozone primary and secondary standards on and after August 4th, 2019 (see Transportation Conformity Guidance for 2015 Ozone NAAQS Nonattainment Areas).

[iv] ppm = parts per million

[v] Transportation conformity requirements for CO no longer apply after June 1, 2018, for the following California Carbon Monoxide Maintenance Areas (see co-maintenance-letter.pdf).

[vi] On December 14, 2012, the national annual PM2.5 primary standard was lowered from 15 µg/m^3 to 12 µg/m^3. The existing national 24-hour PM2.5 standards (primary and secondary) were retained at 35 µg/m^3, as was the annual secondary standard of 15 µg/m^3. The existing 24-hour PM10 standards (primary and secondary) of 150 µg/m^3 also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

[vii] µg/m^3 = micrograms per cubic meter

[viii] The 65 µg/m^3 $PM_{2.5}$ (24-hr) NAAQS was not revoked when the 35 µg/m^3 NAAQS was promulgated in 2006. The 15 µg/m^3 annual PM2.5 standard was not revoked when the 12 µg/m^3 standard was promulgated in 2012. Therefore, for areas designated nonattainment or nonattainment/maintenance for the 1997 and or 2006 $PM_{2.5}$ NAAQS, conformity requirements still apply until the NAAQS are fully revoked.

[ix] Final 1-hour NO_2 NAAQS published in the Federal Register on 2/9/2010, effective 3/9/2010. Initial area designation for California (2012) was attainment/unclassifiable throughout. Project-level hot spot analysis requirements do not currently exist. Near-road monitoring starting in 2013 may cause re-designation to nonattainment in some areas after 2016.

[x] On June 2, 2010, a new 1-hour SO_2 standard was established, and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until 1 year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

[xi] Secondary standard, the levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant rather than health. Conformity and environmental analysis address both primary and secondary NAAQS.

[xii] CARB has identified vinyl chloride and the particulate matter fraction of diesel exhaust as toxic air contaminants. Diesel exhaust particulate matter is part of PM_{10} and, in larger proportion, $PM_{2.5}$. Both CARB and U.S. EPA have identified lead and various organic compounds that are precursors to ozone and $PM_{2.5}$ as toxic air contaminants. There are no exposure criteria for adverse health effect due to toxic air contaminants, and control requirements may apply at ambient concentrations below any criteria levels specified above for these pollutants or the general categories of pollutants to which they belong.

Pollutant	Averaging Time	State Standard [i]	Federal Standard [ii]	State Project Attainment Status	Federal Project Area Attainment Status

[xiii] Lead NAAQS are not considered in Transportation Conformity analysis.
[xiv] In 1989, CARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

Table 2.2.6-2. Air Pollutant Effects and Sources

Pollutant	Principal Health and Atmospheric Effects	Typical Sources
Ozone (O_3)	High concentrations irritate lungs. Long-term exposure may cause lung tissue damage and cancer. Long-term exposure damages plant materials and reduces crop productivity. Precursor organic compounds include many known toxic air contaminants. Biogenic VOC may also contribute.	Low-altitude ozone is almost entirely formed from ROG/volatile organic compounds (VOC) and nitrogen oxides (NOx) in the presence of sunlight and heat. Common precursor emitters include motor vehicles and other internal combustion engines, solvent evaporation, boilers, furnaces, and industrial processes.
Carbon Monoxide (CO)	CO interferes with the transfer of oxygen to the blood and deprives sensitive tissues of oxygen. CO is also a minor precursor for photochemical ozone. Colorless, odorless.	Combustion sources, especially gasoline-powered engines and motor vehicles. CO is the traditional signature pollutant for on-road mobile sources at the local and neighborhood scale.
Respirable Particulate Matter (PM_{10})	Irritates eyes and respiratory tract. Decreases lung capacity. Associated with increased cancer and mortality. Contributes to haze and reduced visibility. Includes some toxic air contaminants. Many toxic and other aerosol and solid compounds are part of PM_{10}.	Dust- and fume-producing industrial and agricultural operations; combustion smoke and vehicle exhaust; atmospheric chemical reactions; construction and other dust-producing activities; unpaved road dust and re-entrained paved road dust; natural sources.
Fine Particulate Matter ($PM_{2.5}$)	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and produces surface soiling. Most diesel exhaust particulate matter—a toxic air contaminant—is in the $PM_{2.5}$ size range. Many toxic and other aerosol and solid compounds are part of $PM_{2.5}$	Combustion including motor vehicles, other mobile sources, and industrial activities; residential and agricultural burning; also formed through atmospheric chemical and photochemical reactions involving other pollutants including NOx, sulfur oxides (SOx), ammonia, and ROG.
Nitrogen Dioxide (NO_2)	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown. Contributes to acid rain and nitrate contamination of stormwater. Part of the “NOx” group of ozone precursors.	Motor vehicles and other mobile or portable engines, especially diesel; refineries; industrial operations.

Pollutant	Principal Health and Atmospheric Effects	Typical Sources
Sulfur Dioxide (SO_2)	Irritates respiratory tract; injures lung tissue. Can yellow plant leaves. Destructive to marble, iron, steel. Contributes to acid rain. Limits visibility.	Fuel combustion (especially coal and high-sulfur oil), chemical plants, sulfur recovery plants, metal processing; some natural sources like active volcanoes. Limited contribution possible from heavy-duty diesel vehicles if ultra-low sulfur fuel not used.
Lead (Pb)	Disturbs gastrointestinal system. Causes anemia, kidney disease, and neuromuscular and neurological dysfunction. Also a toxic air contaminant and water pollutant.	Lead-based industrial processes like battery production and smelters. Lead paint, leaded gasoline. Aerially deposited lead from older gasoline use may exist in soils along major roads.
Sulfates	Premature mortality and respiratory effects. Contributes to acid rain. Some toxic air contaminants attach to sulfate aerosol particles.	Industrial processes, refineries and oil fields, mines, natural sources like volcanic areas, salt-covered dry lakes, and large sulfide rock areas.
Hydrogen Sulfide (H_2S)	Colorless, flammable, poisonous. Respiratory irritant. Neurological damage and premature death. Headache, nausea. Strong odor.	Industrial processes such as: refineries and oil fields, asphalt plants, livestock operations, sewage treatment plants, and mines. Some natural sources like volcanic areas and hot springs.
Visibility Reducing Particles (VRP)	Reduces visibility. Produces haze. NOTE: not directly related to the Regional Haze program under the Federal Clean Air Act, which is oriented primarily toward visibility issues in National Parks and other “Class I” areas. However, some issues and measurement methods are similar.	See particulate matter above. May be related more to aerosols than to solid particles.
Vinyl Chloride	Neurological effects, liver damage, cancer. Also considered a toxic air contaminant.	Industrial processes

Source: (California Department of Transportation, 2020)
Notes: O_3 = ozone; CO = carbon monoxide; PM_{10} = particles of 10 micrometers or smaller; $PM_{2.5}$ = particles of 2.5 micrometers or smaller; NO_x = nitrogen oxide; NO_2 = nitrogen dioxide; ROG = reactive organize gases; SO_x = sulfur oxide; SO_2 = sulfur dioxide; Pb = lead; VOC = volatile organic compound

Table 2.2.6-3 lists the State and federal attainment status for all regulated pollutants. Under current designations of the San Francisco Bay Area Air Basin, the Project Study Limits are in nonattainment with California Ambient Air Quality Standards (CAAQS) for O_3, PM_{10}, and $PM_{2.5}$. The Air Basin is also in nonattainment with NAAQS for O_3 and $PM_{2.5}$, and Unclassifiable/ Attainment for PM_{10}, NO_2, and SO_2.

Table 2.2.6-3. Attainment Plan Status

Pollutant	State Attainment Status	Federal Attainment Status	Attainment Plan
O_3	Nonattainment	Nonattainment (Marginal)	Revised *San Francisco Bay Area Ozone Attainment Plan* for the 1-Hour National Ozone Standard (2001)
Respirable Particulate Matter (PM_{10})	Nonattainment	Unclassified/ Attainment	--
Fine Particulate Matter ($PM_{2.5}$)	Nonattainment	Nonattainment (Moderate)	*Bay Area Winter Emissions Inventory for Primary $PM_{2.5}$ & PM Precursors*: Year 2010 (2012)
CO	Attainment	Attainment	2004 Revision to the *California State Implementation Plan for Carbon Monoxide* (2004)
NO_2	Attainment	Unclassified/ Attainment	--
SO_2	Attainment	Unclassifiable/ Attainment	--
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: (California Air Resources Board 2022b)
Notes: O3 = ozone; CO = carbon monoxide; N/A = not applicable; PM10 = particles of 10 micrometers or smaller; PM2.5 = particles of 2.5 micrometers or smaller; NO2 = nitrogen dioxide; SO2 = sulfur dioxide; Pb = lead

The closest operating air quality monitoring sites to the Project that BAAQMD uses for compliance purposes are the Martinez-Jones Street site, located approximately 1.5-miles southwest of I-680 at 521 Jones Street in Martinez, and the Concord-Treat Boulevard site, located approximately 1.9-miles east of I-680 at 2956 Treat Boulevard in Concord (Illingworth & Rodkin, Inc. 2023). The Martinez-Jones Street site monitors ambient SO_2 and toxic organic compounds (TOC), while the Concord-Treat Boulevard site monitors ambient concentrations of criteria air pollutants including CO, NOX, PM_{10}, $PM_{2.5}$, O_3, as well as SO_2 and TOCs. Table 2.2.6-4 provides air quality concentrations from 2017 through 2021 at these stations. Table 2.2.6-5 lists the status of SIPs relevant to the Project Study Limits.

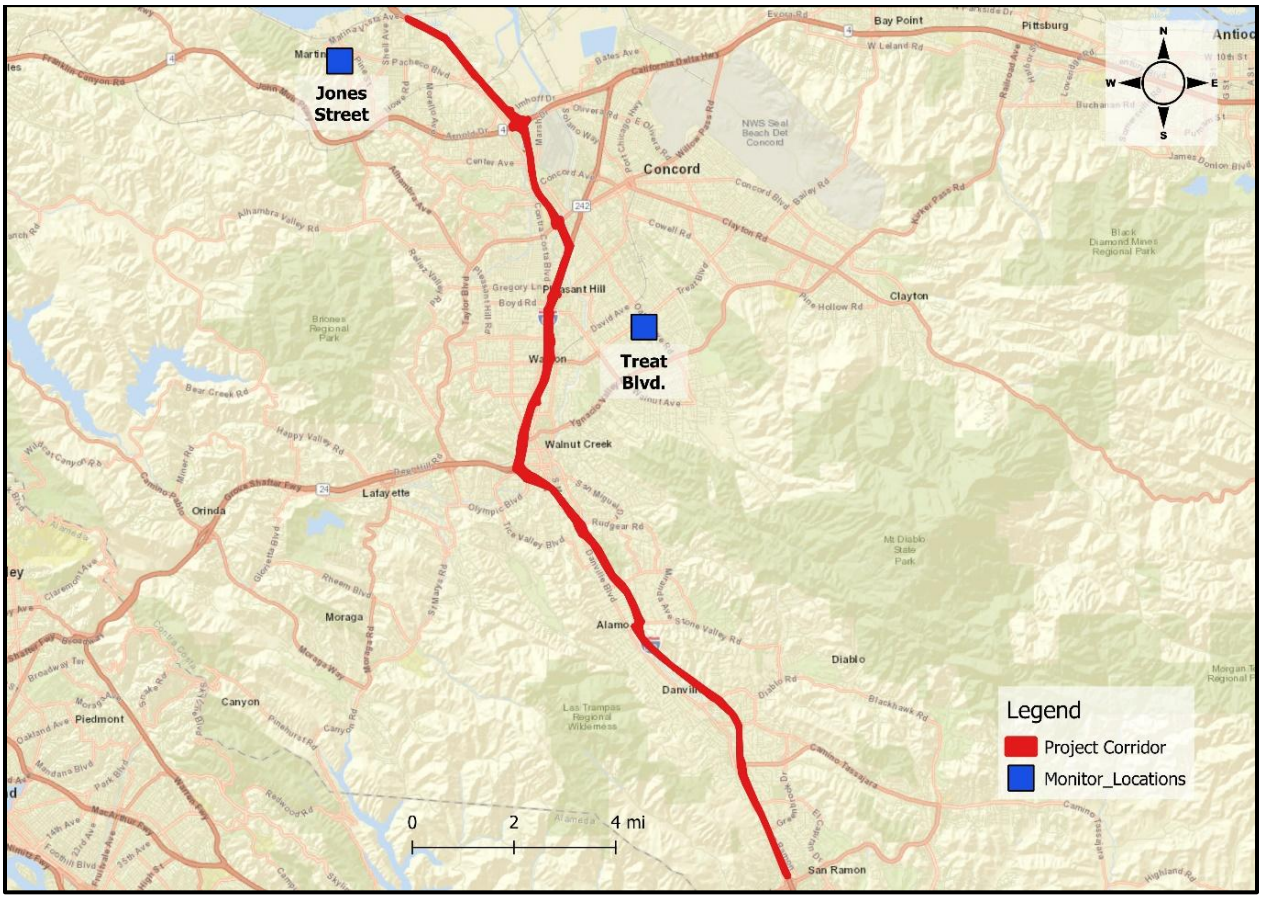


Figure 2.2.6-1. Map of Air Quality Monitoring Stations Located Near the Project

Table 2.2.6-4. Air Quality Concentrations for 2017–2021

Pollutant	Standard	2017	2018	2019	2020	2021
O_3 Measured at Concord-Treat Boulevard Site						
Max 1-hr concentration		0.082 ppm	0. 077 ppm	0.092 ppm	0.108 ppm	0.096 ppm
No. days exceeded: CAAQS	0.09 ppm	0	0	0	2	1
Max 8-hr concentration		0.070 ppm	0.061 ppm	0.074 ppm	0.083 ppm	0.078 ppm
No. days exceeded: CAAQS NAAQS	0.070 ppm 0.070 ppm	0 0	0 0	2 2	3 3	1 1
CO Measured at Concord-Treat Boulevard Site						
Max 1-hr concentration		1.7 ppm	1.9 ppm	3.3 ppm	2.9 ppm	0.9 ppm
No. days exceeded: CAAQS NAAQS	20 ppm 35 ppm	0 0	0 0	0 0	0 0	0 0
Max 8-hr concentration		1.3 ppm	1.6 ppm	0.8 ppm	1.4 ppm	0.8 ppm
No. days exceeded: CAAQS NAAQS	9.0 ppm 9 ppm	0 0	0 0	0 0	0 0	0 0
PM_{10} Measured at Concord-Treat Boulevard Site						
Max 24-hr concentration		41.2 µg/m^3	105.0 µg/m^3	36 µg/m^3	167 µg/m^3	26.0 µg/m^3
No. days exceeded: CAAQS NAAQS	50 µg/m^3 150 µg/m^3	0 0	0 0	11.5 0	* 11.5	0 0
Max annual concentration		13.3 µg/m^3	16.2 µg/m^3	11.4 µg/m^3	*	12.1
Standard exceeded: CAAQS	20 µg/m^3	No	No	No	N/A	No
$PM_{2.5}$ Measured at Concord-Treat Boulevard Site						
Max 24-hr concentration		89.4 µg/m^3	180.0 µg/m^3	28.2 µg/m^3	119.8 µg/m^3	43.7 µg/m^3
No. days exceeded: NAAQS	35 µg/m^3	6.0	14.2	0	16.2	2
Max annual concentration		12.0 µg/m^3	13.4 µg/m^3	6.8 µg/m^3	11.0 µg/m^3	8.1 µg/m^3
Standard exceeded: CAAQS NAAQS	12 µg/m^3 12.0 µg/m^3	No No	Yes Yes	No No	No No	No No
NO_2 Measured at Concord-Treat Boulevard Site						
Max 1-hr concentration		0.041 ppm	0.038 ppm	0.041 ppm	0.034 ppm	0.029 ppm

Pollutant	Standard	2017	2018	2019	2020	2021
No. days exceeded: CAAQS NAAQS	0.18 ppm 0.10 ppm	0 0	0 0	0 0	0 0	0 0
Max annual concentration		0.007 ppm	0.006 ppm	0.006 ppm	0.006 ppm	0.005 ppm
No. days exceeded: CAAQS NAAQS	0.030 ppm 0.053 ppm	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A

Source: (California Air Resources Board, 2023), (Bay Area Air Quality Management District, 2025)
Notes: CAAQS = California Ambient Air Quality Standards; NAAQS = National Ambient Air Quality Standards; O_3 = ozone; CO = carbon monoxide; hr = hour; PM_{10} = particles of 10 micrometers or smaller; $PM_{2.5}$ = particles of 2.5 micrometers or smaller; ppm = parts per million; NO_2 = nitrogen dioxide; N/A = Not available; $\mu g/m^3$ = microgram per cubic meter
* There was insufficient data available to determine the value.

Table 2.2.6-5. Status of State Implementation Plans Relevant to the Project Area

Name/Description	Status
O_3	Revised San Francisco Bay Area Ozone Attainment Plan for the One-Hour National Ozone Standard (2001)
$PM_{2.5}$	No SIP required. Bay Area Winter Emissions Inventory for Primary $PM_{2.5}$ & PM Precursors: Year 2010 (2012)
CO	No conformity requirements. 2004 Revision to the California State Implementation Plan for Carbon Monoxide (2004)

Source: (California Air Resources Board, 2022a)
Notes: O_3 = ozone; $PM_{2.5}$ = particles of 2.5 micrometers or smaller; CO = carbon monoxide

Sensitive Receptors

The BAAQMD defines sensitive receptors to include residential dwellings (including single-family houses and multi-family residential buildings, townhouses, and apartments), schools, daycare centers, hospitals, and senior-care facilities. Based on research, the zone of greatest concern near roadways is within 500 feet.

Due to the length of the corridor and number of sensitive receptors within 500 feet of northbound I-680, addresses and specific distances for each sensitive receptor identified were not collected. Sensitive receptor locations were identified using Google Maps. Sensitive receptors include 13 schools, 11 daycares, 1 hospital, 3 senior/assisted living facilities, 2 parks, and 45 residential areas (Illingworth & Rodkin, Inc., 2024). **Error! Reference source not found.** provides the location of sensitive receptors near the Project corridor.

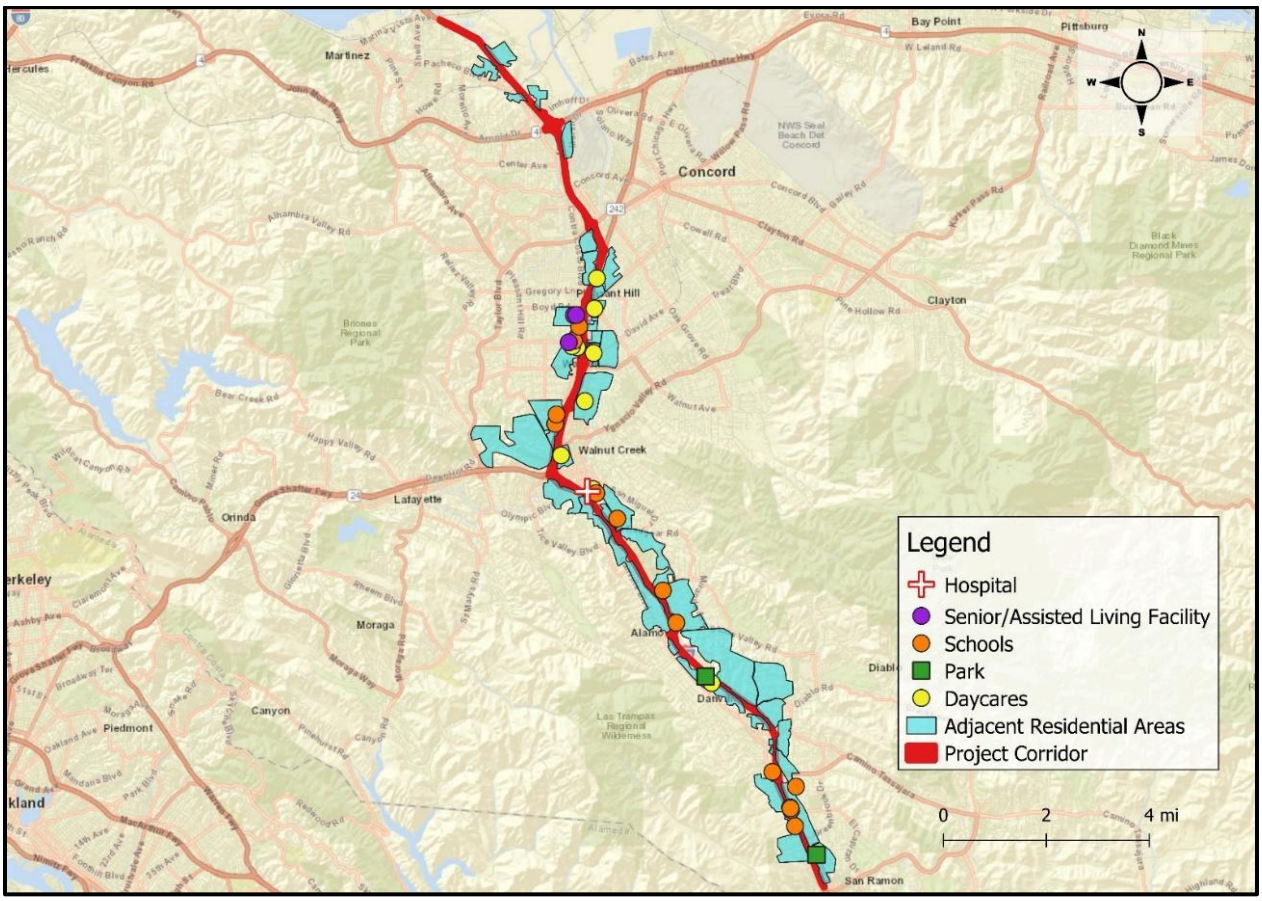


Figure 2.2.6-2. Sensitive Receptors Located Near the I-680 Corridor

Mobile Source Air Toxics

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments of 1990, whereby Congress mandated that the U.S. EPA regulate 188 air toxics, also known as hazardous air pollutants. The U.S. EPA has assessed this expansive list in its rule on the Control of Hazardous Air Pollutants from Mobile Sources (72 Federal Register 8430 [February 26, 2007]), and identified a group of 93 compounds emitted from mobile sources that are part of U.S. EPA's Integrated Risk Information System (https://www.epa.gov/iris). In addition, the U.S. EPA identified nine compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers or contributors and non-hazard contributors from the 2011 National Air Toxics Assessment (https://www.epa.gov/national-air-toxics-assessment). These are 1,3-butadiene, acetaldehyde, acrolein, benzene, diesel particulate matter (diesel PM), ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority mobile source air toxics (MSAT), the list is subject to change and may be adjusted in consideration of future U.S. EPA rules. The 2007 U.S. EPA rule requires controls that will dramatically decrease MSAT emissions through cleaner fuels and

cleaner engines. The Project is located near sources that emit priority MSATs, including non-mobile sources. The primary sources are traffic and stationary sources.

Traffic

Vehicles that travel to, from, and on I-680, and on the surrounding local roadways and arterials are the largest sources of MSATs affecting sensitive receptors (e.g. schools, child-care centers, hospitals, and parks) in the Project area. Vehicle traffic in the area is generated by the businesses, shopping centers, parking lots and garages, fuel stations, maintenance facilities, restaurants, and residential areas adjacent to I-680 in the cities/towns of Concord, Pleasant Hill, Walnut Creek, and Alamo. Additionally, vehicles traveling through the area on State Route (SR) 4, SR-242, and SR-24 generate MSATs affecting sensitive receptors.[2]

Permitted Stationary Sources

There are approximately 31 permitted stationary sources of air pollution within 500 feet of the Project Study Limits. The majority of those closest to the Project Study Limits include gas stations, back-up diesel generators, auto body shops, and light industrial facilities. The I-680 corridor between SR-4 and the Benicia-Martinez Bridge Toll Plaza is quite industrialized. The largest stationary source is the Shell Martinez Refinery, which is adjacent to I-680 in northern Contra Costa County. However, none of these large industrial facilities are within 500 feet of the northbound lanes of I-680, nor are they located close to residential areas or other sensitive receptors.

Railroads

The BNSF railroad crosses under I-680 at Marina Vista Avenue in northern Contra Costa County, just south of the Benicia-Martinez Bridge Toll Plaza. Railroad traffic includes both freight and passenger diesel locomotives.

MSAT Monitoring

Ambient MSAT data are available from CARB's website (California Air Resources Board, 2023). The closest CARB monitoring station reporting recent data is located in Concord, California (2975 Treat Boulevard).

2.2.6.3 Environmental Consequences

No-Build Alternative

The No-Build Alternative would maintain the current configurations of I-680 in the Study Area. Under the No-Build Alternative, the proposed Project would not be constructed,

[2] CARB's *Air Quality and Land Use Handbook* identifies the following land uses as particularly sensitive to MSATs: residential areas, schools, hospitals and other health care facilities, day care and other childcare facilities, and parks and playgrounds. (California Air Resources Board, 2005)

and no impacts on air quality would occur. In general, the improvements included in the No-Build Alternative are the projects that are included in MTC's *Plan Bay Area 2050* RTP. The gap in the northbound managed lane would remain and as traffic demand increases, traffic operations along northbound I-680 would further deteriorate, potentially resulting in increased congestion, vehicle delay, vehicle operating costs, and potentially vehicle emissions due to slower operating speeds on northbound I-680. As depicted in Table 2.2.6-6 and Table 2.2.7-7 (below), particulate matter is anticipated to increase due to forecasted increases in vehicle miles traveled (VMT) compared to existing conditions; however, CO, ROG, NO_x, and MSAT emissions are anticipated to be less than existing conditions.

Build Alternatives (Alternatives 1C, 2, 3, and 5)

Regional Conformity

The proposed Project is listed in the *Plan Bay Area 2050* financially constrained RTP as Project 21-T12-116 (Express Lanes – Regional) (Association of Bay Area Governments and Metropolitan Transportation Commission, 2021), which was found to conform by MTC on October 21, 2021. FHWA and FTA made a regional conformity determination finding on December 3, 2021.

The Project is also included MTC's financially constrained 2025 Transportation Improvement Program (TIP) and Transportation-Air Quality Conformity Analysis as project TIP ID CC-170017 (I-680 Northbound Express Lane Completion) (Metropolitan Transportation Commission, 2024). MTC forwarded the 2025 TIP to Caltrans to be included in the 2023 Federal-Statewide Transportation Improvement Program (FSTIP) by reference. The State approved the 2025 FSTIP on November 15, 2024. FHWA and FTA approved the 2025 FSTIP in December 2024.

Alternative 2 has been selected as the preferred alternative. The design concept and scope of Alternatives 2 are consistent with the project description in *Plan Bay Area 2050*, the 2025 TIP, and the open to traffic assumptions of MTC's regional emissions analysis. Therefore, the Project will not interfere with the timely implementation of any Transportation Control Measures identified in the SIP.

Project-Level Conformity

Project-level conformity requires project sponsors to demonstrate that their transportation project would not cause or contribute to any new localized CO, PM_{10}, and/or $PM_{2.5}$ violations; increase the frequency or severity of any existing CO, PM_{10}, and/or $PM_{2.5}$ violations; or delay timely attainment of any NAAQS or any required interim emission reductions or other SIP milestones. This is demonstrated through a hot-spot analysis where No-Build and Build emissions are modeled, both with and without any mitigation measures committed to in the RTP.

The Project is in an attainment area for CO and a nonattainment area for $PM_{2.5}$. Thus, a project-level conformity analysis applies to the Project for $PM_{2.5}$ under 40 CFR 93.109.

However, hot-spot analysis for $PM_{2.5}$ is only required for projects found to meet the definition of a project of air quality concern (POAQC) by the MPO's Air Quality Conformity Task Force.

The Bay Area Air Quality Conformity Task Force found that Alternatives 1C, 2, and 3 would not be a POAQC on April 1, 2022, and Alternative 5 was not a POAQC on February 24, 2023. CCTA also discussed the change in the Project limits with the Task Force, who confirmed the Project was not a POAQC on December 19, 2023. Therefore, a $PM_{2.5}$ hot-spot analysis is not required. The Task Force's determinations are provided in Appendix F, Comments and Coordination. 40 CFR 93.123(c)(5) states the following:

> "CO, PM_{10}, 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."

Project sponsors are required to undergo a proactive public involvement process, which provides opportunity for public review as outlined by 40 CFR 93.105(e). For projects that are not a POAQC, a comment period is only required for project level conformity determinations if such a comment period would have been required under NEPA.

As described in Chapter 4, *Comments and Coordination*, public comments were requested regarding the Task Force's determination. After public circulation of the Draft EIR/EA, the Project's air quality studies were submitted to FHWA for a project-level conformity determination. FHWA made the final determination on project-level conformity on June 23, 2025, which is included in Appendix F, *Consultation and Coordination*.

As described further below, long-term (operational) emissions and short-term (construction) emissions were estimated for purposes of NEPA and the California Environmental Quality Act (CEQA).

Additional Environmental Analysis

Criteria Pollutants

Project operations would generate criteria air pollutant and ozone precursor emissions that could potentially affect regional air quality. Operational emissions consider long-term changes in emissions due to the Project (excluding the construction phase). According to BAAQMD, the primary criteria air pollutant emissions of concern during Project operation would be ozone precursors (ROG and NO_x), PM_{10}, and $PM_{2.5}$ from on-road vehicle exhaust. Criteria air pollutant emissions from Project operations were estimated for Existing Year (2020), Opening Year (2027), Design Year (2047), and RTP Horizon Year (2050).

Table 2.2.6-6 provides the estimated operational emissions for the Build Alternatives and the No-Build Alternative. Overall, emissions of ROG, CO, and NO_X would decrease in the future by between 27 percent and 72 percent as older vehicles are replaced by newer vehicles with more stringent emissions and fuel economy standards. PM_{10} emissions trend directly with VMT, because of break wear, tire wear, and road dust emissions. Thus, PM_{10} emissions are forecast to increase in the future as a function of VMT. Similarly, $PM_{2.5}$ emissions increase in 2050 when compared to baseline conditions (as increases in VMT overcome the reduction in DPM emissions) but would see a 7 percent decrease in 2027 as a result of more strict diesel vehicle emissions standards being phased in by 2023 ($PM_{2.5}$ emissions in 2047 are similar to baseline conditions). NOx emissions for Alternatives 1C, 2, and 3 would be comparable to that of the No-Build Alternative (i.e., less than a 1 percent difference) for the design year (2047) and RTP horizon year (2050). Alternative 5 would have much lower NOx emissions than the No-Build Alternative in the design year (2047) and RTP horizon year (2050) (approximately 5 to 6 percent lower). Meanwhile, ROG emissions for all Build Alternatives would be comparable to that of the No-Build Alternative (i.e., 1 percent or less difference) in the design year (2047) and horizon year (2050). Alternatives 1C, 2, and 3 would all slightly reduce ROG. However, Alternative 5 would increase ROG by approximately one percent in all the analysis years. CO, PM_{10}, and $PM_{2.5}$ emissions for Alternatives 1C, 2, and 3 would be slightly higher than the No-Build Alternative (i.e., less than a 1 percent increase) for the design year (2047) and RTP horizon year (2050). Meanwhile, Build Alternative 5 would have lower PM and NO_X emissions (1.4 percent lower $PM_{2.5}$, 1.9 percent PM_{10}, and 3 percent lower NO_X), higher ROG emissions (1 percent higher), and approximately the same (i.e., 0.1 percent or less difference) CO emissions in 2027. These trends continue to 2047 and 2050 (1.7 to 1.2 percent lower $PM_{2.5}$, 2 percent to 1.5 percent lower PM_{10}, 5 to 6 percent lower NO_X, and 1 percent higher ROG) except for CO which reduces slightly (i.e., less than a 1 percent decrease).

Table 2.2.6-6. Estimate of Operational Criteria Air Pollutant Emissions

Scenario/ Analysis Year		CO (lbs/day)	$PM_{2.5}$ (lbs/day)	PM_{10} (lbs/day)	ROG (lbs/day)	NO_x (lbs/day)[i]
Existing Year (2020)		246,706	4,614	20,091	15,484	66,342
Opening Year (2027)	No-Build	161,632	4,307	20,305	11,356	31,013
	Alternative 1C	161,704	4,309	20,315	11,364	31,037
	Alternative 2 *	161,649	4,308	20,312	11,354	31,037
	Alternative 3	161,663	4,309	20,314	11,351	31,020
	Alternative 5	161,619	4,246	19,914	11,452	30,005
Design Year (2047)	No-Build	125,329	4,610	22,920	8,580	18,759
	Alternative 1C	125,397	4,614	22,941	8,573	18,759
	Alternative 2 *	125,347	4,613	22,937	8,568	18,748
	Alternative 3	125,337	4,613	22,937	8,567	18,749

Scenario/ Analysis Year		CO (lbs/day)	$PM_{2.5}$ (lbs/day)	PM_{10} (lbs/day)	ROG (lbs/day)	NO_x (lbs/day)[i]
	Alternative 5	125,172	4,530	22,454	8,646	17,601
RTP Horizon Year (2050)	No-Build	126,798	4,679	23,292	8,607	18,870
	Alternative 1C	126,877	4,684	23,314	8,601	18,872
	Alternative 2 *	126,836	4,683	23,310	8,602	18,862
	Alternative 3	126,807	4,682	23,310	8,594	18,858
	Alternative 5	126,600	4,622	22,941	8,673	17,930

Source: (Illingworth & Rodkin, Inc., 2024)
Notes: CO = carbon monoxide; $PM_{2.5}$ = particles of 2.5 micrometers or smaller; PM_{10} = particles of 10 micrometers or smaller; ROG = reactive organic gas; NO_x = nitrogen oxides; RTP = Regional Transportation Plan
[i] Surrogate for nitrous dioxide (NO_2)
* Alternative 2 is the preferred alternative.

Variances in NOx are due primarily to changes in speeds within the region resulting from each alternative. Changes in ROG emissions are associated primarily with VMT increases being overcome by changes to the vehicle fleet (i.e., fleet modernization) and travel speeds. Changes in regional travel speeds also influence ROG emissions, as Alternatives 2 and 3 have lower emissions in opening year (2027) than Alternative 1C. Increases in CO, PM_{10}, and $PM_{2.5}$ are due to the slight (less than 0.1 percent) increase in VMT associated with Alternatives 1C, 2, and 3. Alternative 5 would not substantially increase VMT (estimated to be 0.01 percent increase when compared to the No-Build Alternative) and would increase vehicle speeds (i.e. less congestion). None of the Build Alternatives would change the percentage of truck traffic in the region. As a result, no avoidance, minimization, or mitigation measures are recommended for operation of the proposed Project for air quality impacts.

As described further in Section 3.2.17, *Transportation*, the Project would implement Measures **TRAN-MM-1**, **TRAN-MM-2**, and **TRAN-MM-3** under CEQA (i.e., Senate Bill [SB] 743) to offset the increase in VMT. The estimates of operational emissions provided in Table 2.2.6-6, which were provided for informational purposes only, do not factor into these measures. Implementing **TRAN-MM-1**, **TRAN-MM-2**, and **TRAN-MM-3** could potentially reduce operational CO, PM_{10}, and $PM_{2.5}$ emissions under Alternatives 1C, 2, and 3.

Mobile Source Air Toxics

FHWA released guidance in October 2016 for determining when and how to address MSAT impacts in the NEPA process for transportation projects (Federal Highway Administration, 2016). FHWA identified the following three levels of analysis:

- Category 1: No analysis for exempt projects or projects with no potential for meaningful MSAT effects,

- Category 2: Qualitative analysis for projects with low potential MSAT effects,
- Category 3: Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects.

Projects with no impacts generally include those that; (a) qualify as a categorical exclusion under 23 CFR 771.117, (b) qualify as exempt under the FCAA conformity rule under 40 CFR 93.126, and (c) are not exempt, but have no meaningful impacts on traffic volumes or vehicle mix.

Projects that have low potential MSAT effects are those that serve to improve highway, transit, or freight operations or movement without adding substantial new capacity, or do not create a facility that is likely to substantially increase emissions. Most projects fall into this category.

Projects with higher potential MSAT effects include the following:

- Create or significantly alter a major intermodal freight facility that has the potential to concentrate high levels of diesel PM in a single location;
- Create new or add significant capacity to urban highways such as interstates, urban arterials, or urban collector-distributor routes where the AADT is projected to be in the range of 140,000 to 150,000, or greater, by the design year;
- Are proposed to be in proximity to populated areas or, in rural areas, in proximity to concentrations of vulnerable populations (i.e., schools, nursing homes, hospitals).

This assessment considers the expected effect of the Project on traffic volumes, vehicle mix, or traffic routing and the associated changes in MSAT for the Project alternatives (i.e., No-Build and Build Alternatives) based on VMT, vehicle mix, and speed. Since the emission effects of this type of project typically are low, no appreciable difference in overall MSAT emissions between the Build Alternatives within the same analysis years are expected.

The Project would not have a meaningful impact on traffic volumes or vehicle mix nor move major roadways closer to sensitive receptors. Therefore, it is being considered as a “Category 1” project. Category 1 projects are not required to show quantitative MSAT emissions. The MSAT emissions estimates provided in Table 2.2.6-7 were provided for informational purposes only.

The amount of MSAT emitted is expected to be proportional to VMT, assuming other variables such as speeds and fleet mix are similar. Table 2.2.6-7 provides the MSAT emissions estimated for the Build Alternatives compared to the No-Build Alternative. CT-EMFAC2021 was used to estimate the emissions of nine MSAT pollutants: acetaldehyde, benzene, ethylbenzene, 1,3-butadiene, formaldehyde, acrolein,

naphthalene, diesel PM, and polycyclic organic matter (POM). VMT were estimated for the opening year (2027), design year (2047), and RTP horizon year (2050) and applied to the CT-EMFAC2021 emission factors.

When compared to the No-Build Alternative, Alternatives 1C, 2, and 3 would result in MSAT emissions that are comparable to the No-Build Alternative (i.e., less than 1 percent difference). Compared to the No-Build Alternative, Build Alternative 5 would slightly increase MSAT emissions (approximately 2 percent increase on average) in all future years, with the exception of diesel particulate matter, which would decrease by approximately 2 percent on average. This is a result of the impacts associated with VMT increases being overcome by changes to the vehicle fleet (i.e., fleet modernization) and reduced congestion (i.e., increased travel speeds).

As described further in Section 3.2.17, *Transportation*, the Project would implement Mitigation Measures **TRAN-MM-1**, **TRAN-MM-2**, and **TRAN-MM-3** under CEQA (i.e., SB 743) to offset the increase in VMT. The MSAT emissions estimates provided in Table 2.2.6-7, which were provided for informational purposes only, do not factor into these mitigation measures. Additionally, the mitigation measures could potentially reduce MSAT emissions under Alternatives 1C, 2, and 3.

Regardless of the alternative chosen, emissions would be lower farther in the future because of U.S. EPA's national control programs that are projected to reduce annual MSAT emissions by 76 percent between 2020 and 2060. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the U.S. EPA-projected reductions is so great (even after accounting for VMT associated with planned growth) that MSAT emissions in the region would be 46 to 70 percent lower in the future for the No-Build and Build Alternatives.

Table 2.2.6-7. Summary of Comparative Mobile Source Air Toxics Emissions

Analysis Scenario/ Analysis Year		1,3-butadiene (lbs/day)	Acetaldehyde (lbs/day)	Acrolein (lbs/day)	Benzene (lbs/day)	Diesel PM (lbs/day)	Ethylbenzene (lbs/day)	Formaldehyde (lbs/day)	Naphthalene (lbs/day)	POM (lbs/day)
Existing Year (2020)		27.53	119.09	2.38	429.94	622.60	171.46	274.26	26.52	7.16
Opening Year (2027)	No-Build Alternative	15.00	71.83	1.34	276.86	214.06	123.16	162.95	13.70	4.19
	Alternative 1C	15.02	71.89	1.34	277.09	214.37	123.25	163.08	13.71	4.19
	Alternative 2 *	15.02	71.87	1.34	276.92	214.54	123.16	163.04	13.71	4.19

Analysis Scenario/ Analysis Year		1,3-butadiene (lbs/day)	Acetaldehyde (lbs/day)	Acrolein (lbs/day)	Benzene (lbs/day)	Diesel PM (lbs/day)	Ethylbenzene (lbs/day)	Formaldehyde (lbs/day)	Naphthalene (lbs/day)	POM (lbs/day)
	Alternative 3	15.01	71.84	1.34	276.80	214.33	123.11	162.97	13.70	4.19
	Alternative 5	15.11	77.16	1.34	279.30	214.78	123.84	173.52	13.81	4.37
Design Year (2047)	No-Build Alternative	8.56	33.59	0.85	184.45	119.23	90.04	78.34	7.21	1.98
	Alternative 1C	8.55	33.59	0.85	184.34	119.40	89.97	78.33	7.21	1.98
	Alternative 2 *	8.55	33.57	0.85	184.24	119.43	89.92	78.29	7.21	1.98
	Alternative 3	8.55	33.57	0.85	184.24	119.61	89.91	78.29	7.21	1.98
	Alternative 5	8.64	35.66	0.85	185.77	116.15	90.62	82.48	7.24	2.02
RTP Horizon Year (2050)	No-Build Alternative	8.48	32.58	0.86	185.02	115.73	90.40	76.30	7.32	1.89
	Alternative 1C	8.48	32.58	0.86	184.93	115.89	90.34	76.30	7.32	1.89
	Alternative 2 *	8.48	32.57	0.86	184.92	115.87	90.34	76.27	7.32	1.89
	Alternative 3	8.48	32.56	0.86	184.79	116.12	90.27	76.25	7.31	1.89
	Alternative 5	8.53	34.53	0.86	186.35	113.82	90.91	80.10	7.33	1.94

Source: (Illingworth & Rodkin, Inc., 2024)
Notes: lbs/day = pounds per day; MSAT = Mobile Source Air Toxics; POM = polycyclic organic matter; RTP = Regional Transportation Plan
* Alternative 2 is the preferred alternative.

Incomplete or Unavailable Information

It should also be noted that current scientific techniques, tools, and data are not sufficient to accurately estimate human health impacts from transportation projects in a way that would be useful to decision-makers. According to 40 CFR 1502.22, when an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an environmental impact statement and there is incomplete or unavailable information, the agency shall always make clear that such information is

lacking. A discussion of incomplete or unavailable information is available in 40 CFR 1502.22 and provided below:

Sec. 1502.22 Incomplete or Unavailable Information:

When an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an environmental impact statement and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking.

(a) If the incomplete information relevant to reasonably foreseeable significant adverse impacts is essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant, the agency shall include the information in the environmental impact statement.

(b) If the information relevant to reasonably foreseeable significant adverse impacts cannot be obtained because the overall costs of obtaining it are exorbitant or the means to obtain it are not known, the agency shall include within the environmental impact statement:

1. a statement that such information is incomplete or unavailable;

2. a statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment;

3. a summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment; and

4. the agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community. For the purposes of this section, "reasonably foreseeable" includes impacts that have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason.

(c) The amended regulation will be applicable to all environmental impact statements for which a Notice to Intent (40 CFR 1508.22) is published in the Federal Register on or after May 27, 1986. For environmental impact statements in progress, agencies may choose to comply with the requirements of either the original or amended regulation.

Incomplete or Unavailable Information for Project Specific MSAT Health Impacts Analysis:

In FHWA's view, 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 highway 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 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 Integrated Risk Information System, which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (U.S. EPA, https://www.epa.gov/iris/). 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* (MSAT - Policy And Guidance - Air Toxics - Air Quality - EnvironMent - FHWA). 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 (HEI Special Report 16, Mobile-Source Air Toxics: A Critical Review of the Literature on Exposure and Health Effects | Health Effects Institute) or in the future as vehicle emissions substantially decrease.

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.

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 (Special Report 16, Mobile-Source Air Toxics: A Critical Review of the Literature on Exposure and Health Effects | Health Effects Institute). 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 [particulate matter]. 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 (https://www.epa.gov/iris)."

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 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 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.

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, collision rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

Short-Term (Construction) Impacts

Construction Emissions for Project-Level Conformity

Proposed construction activities would generate emissions of criteria air pollutants and precursors that could potentially affect regional air quality. Project construction is anticipated to commence in January 2026 and would take approximately 24 months. Construction activities will not last for more than 5 years at one general location, so construction-related emissions do not need to be included in regional and project-level conformity analysis (40 CFR 93.123[c][5]).

Construction Criteria Air Pollutant Emissions

Under all Build Alternatives, temporary direct impacts on air quality would occur as a result of the release of particulate emissions (airborne dust) generated by excavation, grading, and hauling, during construction activities. Additionally, CO, NOx, VOCs, and directly emitted particulate matter (PM_{10} and $PM_{2.5}$) emissions, as well as toxic air contaminants, such as diesel exhaust particulate matter, would result from the operation of construction equipment. Further, ozone is a regional pollutant that is derived from NOx and VOCs in the presence of sunlight and heat.

Site preparation and roadway construction typically involves clearing, cut-and-fill activities, grading, removing and/or improving existing roadways, building bridges, and paving roadway surfaces. Direct construction-related impacts on air quality from most highway projects would be greatest during the site preparation phase because most engine emissions are associated with the excavation, handling, and transport of soils to and from the site. These activities could temporarily generate enough PM_{10}, $PM_{2.5}$, and small amounts of CO, SO_2, NOx, and VOCs to be of concern. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site could deposit mud on local streets, which could be an added source of airborne dust after it dries. PM_{10} emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM_{10} emissions would depend on soil moisture, silt content of soil, wind speed, and the amount of equipment operating. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site.

Construction emissions were quantified using the Caltrans Construction Emissions Tool (Cal-CET2021) (Illingworth & Rodkin, Inc., 2024).The 24-month construction period was divided into two concurrent construction stages (structures and roadway) and nine “default” phases for each stage: Land Clearing/Grubbing, Roadway Excavation and Removal, Structural Excavation and Removal, Base/Subbase/Imported Borrow, Structure Concrete, Paving, Drainage/Environmental/Landscaping, Traffic Signalization Signage, and Other Operations. Average daily emissions were based on 528 working days.

Table 2.2.6-8 provides the estimated uncontrolled criteria air pollutant emissions from Project construction. BAAQMD's current CEQA Guidelines recommend thresholds of significance for project-level criteria air pollutant emissions to assist lead agencies in CEQA determinations. BAAQMD's recommended thresholds include levels at which construction emissions of O_3 precursors (ROG and NO_x), PM_{10}, and $PM_{2.5}$ could cause significant air quality impacts. Since Caltrans has not established significance thresholds for criteria air pollutant emissions for CEQA purposes, BAAQMD's recommended thresholds are included in Table 2.2.6-8 for comparison only.

Table 2.2.6-8. Uncontrolled Criteria Air Pollutant Construction Emissions for the Build Alternatives

	ROG[i] (lbs/ day)	CO (lbs/ day)	NO_x (lbs/ day)	Exhaust PM_{10} (lbs/day)	Exhaust $PM_{2.5}$ (lbs/day)	Fugitive Dust PM_{10} (lbs/day)	Fugitive Dust $PM_{2.5}$ (lbs/day)
Construction Emissions	24.2	118.6	152.6	18.2	11.4	N/A	N/A
BAAQMD CEQA Thresholds	54	N/A	54	82	54	BMP	BMP

Source: (Illingworth & Rodkin, Inc., 2024)
Notes: lbs = pounds; ROG = reactive organic gas; CO = carbon monoxide; NO_x = nitrogen oxides; PM_{10} = particles of 10 micrometers or smaller; $PM_{2.5}$ = particles of 2.5 micrometers or smaller; BAAQMD = Bay Area Air Quality Management District; CEQA = California Environmental Quality Act; BMP = Best Management Practice
[i] ROG is reactive organic gases, which is a subset of total organic gases.

The estimates provided in Table 2.2.6-8 represent the Cal-CET2021 defaults for off-road engine emissions standards and default equipment quantities. Construction emissions estimates are considered a worst-case scenario; actual construction emissions are anticipated to be considerably less than those depicted in Table 2.2.6-8. As shown in Table 2.2.6-8, NO_X emissions are estimated to be in excess of BAAQMD significance thresholds. However, Measure **AQ-5** would be implemented, which includes a requirement to use a fleet of vehicles with U.S. EPA certified Tier 4 engines. It is estimated that Measure **AQ-5** would reduce the Project's NO_X emissions by approximately 67 percent.

Short-term air quality impacts would not be substantial and are expected to be localized around construction activities. Further, U.S. EPA and CARB have adopted rules and emission standards that would reduce diesel particulate matter emissions from on-road and off-road engines for construction equipment. These regulations will continue to be phased in through 2023 and should be fully in place before Project construction begins. Additionally, the construction contractor must comply with Caltrans' Standard Specifications as specified in Measures **AQ-1** through **AQ-4** as well as the BMPs for construction-related emissions in MTC's RTP, as specified in Measures **AQ-5** and **AQ-6**. Implementation of these measures would further reduce emissions from exhaust

and dust and are consistent with BAAQMD basic controls for construction sites. Where BMPs conflict, the contractor would be required to adhere to the stricter restrictions. Please note that although these measures are anticipated to reduce construction-related emissions, the reductions cannot be quantified at this time.

Asbestos

Asbestos is a known human carcinogen that can be found in manufactured items (e.g., structural asbestos found in ceilings) or found naturally (e.g., naturally occurring asbestos). Based on the information provided by CARB (California Air Resources Board, 2020), this Project is not located in a naturally occurring asbestos area and further analysis is not needed.

Alternatives 1C and 3 would require demolition of the southbound Olympic Boulevard Off-ramp Bridge and roadway widening would require the partial demolition of existing overhangs and railings. These existing structures may have materials that contain asbestos. Prior to demolition activities, the presence or absence of asbestos in the bridge, overhangs, and railings would be confirmed in accordance with Measure **HAZ-3**, as described in Section 2.2.5, *Hazardous Waste/Materials*. Furthermore, demolition and removal of the possible asbestos containing materials (ACM) would be performed in accordance with local, State, and federal requirements, including BAAQMD rules. As specified in Measure **AQ-7**, all Build Alternatives would be required to comply with BAAQMD Regulation 11, Rule 2, ensuring that ACM are disposed of appropriately and safely.

Lead

Lead is normally not an air quality issue for transportation projects unless the project involves disturbance of soils containing high levels of aerially deposited lead (ADL) or painting or modification of structures with lead-based coatings. As detailed in Section 2.2.5, *Hazardous Waste/Materials*, the Project has the potential to disturb soil contaminated with ADL. Prior to Project construction, investigations would be conducted for lead to determine whether ADL has affected soils that would be excavated as part of the Project in accordance with Measure **HAZ-2**. This applies to locations where such testing has not already been completed.

In addition, there is a potential for the presence of lead-based paint on structures. Testing for the presence of lead-based paint would occur as necessary and/or applicable in accordance with Measure **HAZ-3**. If this substance is present, applicable regulations pertaining to its removal and disposal will be followed.

2.2.6.4 Summary

Alternative 2 has been selected as the preferred alternative. As discussed above, Alternative 2 has been determined to not be a POAQC. FHWA's project-level conformity determination is included in Appendix F, Consultation and Coordination. *In accordance with Measures **AQ-1** through **AQ-7**, the construction contractor would be required to*

comply with all applicable laws and regulations related to air quality, including air pollution control district and air quality management district regulations and local ordinances. Therefore, Alternative 2 would not adversely affect air quality.

2.2.6.5 Avoidance, Minimization, and/or Mitigation Measures

Measures **HAZ-2** and **HAZ-3** in Section 2.2.5, *Hazardous Waste/Materials*, require site investigation for ADL and lead-based paint. In addition, the following avoidance and minimization measures would be implemented:

AQ-1 **Equipment Maintenance.** During construction, the Project's Resident Engineer or designated contractor will ensure compliance with Caltrans' Standard Specifications Section 7-1.02C, which requires that the construction contractor keep engines properly tuned and limit idling.

AQ-2 **Stormwater Best Management Practices.** During construction, the Project's Resident Engineer or designated contractor will ensure compliance with Caltrans' Standard Specifications Section 13 – Water Pollution Control, which requires a Stormwater Pollution Prevention Plan (SWPPP) and use of best management practices (BMP) that manage fugitive dust and material track-out from construction sites. Many of the SWPPP requirements and BMPs are the same as BAAQMD's basic controls for construction sites (see AQ-5 and AQ-6).

AQ-3 **Compliance with Air Quality Regulations and Ordinances.** During construction, the Project's Resident Engineer or designated contractor will ensure compliance with Caltrans' Standard Specifications Section 14-9 – Air Quality, which specifically requires compliance by the construction contractor with all applicable laws and regulations related to air quality, including air pollution control district and air quality management district regulations and local ordinances.

AQ-4 **Dust Control.** During construction, the Project's Resident Engineer or designated contractor will ensure compliance with Caltrans' Standard Specifications Section 18 – Dust Palliatives, which includes requirements for the use of dust suppressants or controls that the construction contractor must follow.

AQ-5 **Construction Best Practices for Exhaust.** During construction, the Project's Resident Engineer or designated contractor will ensure that exhaust control BMPs for construction related emissions are implemented as specified in the most recent Regional Transportation Plan, in which the Project is considered, where feasible and necessary. The following are construction BMPs from Mitigation Measure AQ-2 in the *Final Environmental Impact Report Plan Bay Area 2050* (Metropolitan Transportation Commission, 2021):

- Equipment shall be zero emissions or have engines that meet or exceed either EPA or California Air Resources Board (CARB) Tier 4 off-road emission standards, and it shall have engines that are retrofitted with a CARB Level 3 Verified Diesel Emissions Control Strategy (VDECS), if one is available for the equipment being used. Equipment with engines that meet Tier 4 Interim or Tier 4 Final emission standards automatically meet this requirement; therefore, a VDECS would not be required.

- Idling time of diesel-powered construction equipment and trucks shall be limited to no more than two minutes. Clear signage of this idling restriction shall be provided for construction workers at all access points.

- All construction equipment shall be maintained and properly tuned in accordance with the manufacturers' specifications.

- Portable diesel generators shall be prohibited. Grid power electricity should be used to provide power at construction sites; or propane and natural gas generators may be used when grid power electricity is not feasible.

AQ-6 **Construction Best Practices for Dust.** During construction, the Project's Resident Engineer or designated contractor will ensure that dust control BMPs for construction related emissions during ground disturbance are implemented as specified in the most recent Regional Transportation Plan, in which the Project is considered, where feasible and necessary. The following are construction BMPs from Mitigation Measure AQ-2 in the *Final Environmental Impact Report Plan Bay Area 2050* (Metropolitan Transportation Commission, 2021):

- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.

- On-site dirt piles or other stockpiled particulate matter shall be covered, wind breaks installed, and water and/or soil stabilizers employed to reduce wind-blown dust emissions. The use of approved nontoxic soil stabilizers shall be incorporated according to manufacturers' specifications to all inactive construction areas.

- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. Dry power sweeping should only be performed in conjunction with thorough watering of the subject roads.

- All vehicle speeds on unpaved roads and surfaces shall be limited to 15 mph.

- All roadway, driveway, and sidewalk paving shall be completed as soon as possible. Building pads shall be paved as soon as possible after grading.

- All construction sites shall provide a posted sign visible to the public with the telephone number and person to contact at the lead agency regarding dust complaints. The recommended response time for corrective action shall be within 48 hours. BAAQMD's Complaint Line (1-800-334-6367) shall also be included on posted signs to ensure compliance with applicable regulations.

- All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph.

- Wind breaks (e.g., trees, fences) shall be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50 percent air porosity.

- Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established.

- The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time.

- All trucks and equipment, including their tires, shall be washed off before leaving the site.

- Site accesses to a distance of 100 feet from the paved road shall be treated with a 6-to 12-inch compacted layer of wood chips, mulch, or gravel.

AQ-7 Prior to demolition activities, the presence or absence of asbestos in the structures would be confirmed. If asbestos-containing materials are identified, the Project must also comply with BAAQMD Regulation 11, Rule 2 (Asbestos Demolition, Renovation, and Manufacturing), which requires all asbestos-containing material found in the Project footprint be removed prior to demolition or renovation activity. There are specific requirements for surveying, notification, removal, and disposal of asbestos containing materials required by BAAQMD Regulation 11, Rule 2 (Asbestos Demolition, Renovation, and Manufacturing). BAAQMD Regulation should be consulted for specific requirements that pertain to the materials encountered.

2.2.6.6 Climate Change

Neither the United States Environmental Protection Agency (U.S. EPA) nor the Federal Highway Administration (FHWA) has issued explicit guidance or methods to conduct project-level greenhouse gas 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 California Environmental Quality Act (CEQA) chapter of this document. The CEQA analysis may be used to inform the National Environmental Policy Act (NEPA) determination for the project.

Please note: The NEPA Phase II regulations that required climate change to be analyzed were rescinded pursuant to the Removal of NEPA Implementing Regulations Council on Environmental Quality Interim Rule (effective April 11, 2025). However, inclusion of climate change was included in the NEPA section for the Draft Environmental Document prior to the rescission of the NEPA Phase II regulations. Therefore, it has been retained in the Final Environmental Document NEPA section for informational purposes.

2.2.7 Noise and Vibration

2.2.7.1 Regulatory Setting

The National Environmental Policy Act (NEPA) of 1969 and the California Environmental Quality Act (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.

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/Title 23 Part 772 of the Code of Federal Regulations (23 CFR 772) noise analysis; please see Chapter 3 of this document for further information on noise analysis under CEQA.

National Environmental Policy Act and 23 CFR 772

For highway transportation projects with Federal Highway Administration (FHWA) involvement (and California Department of Transportation [Caltrans], 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 A-weighted decibels [dBA]) is lower than the NAC for commercial areas (72 dBA). The following table lists the noise abatement criteria for use in the NEPA/23 CFR 772 analysis.

Table 2.2.7-1. Noise Abatement Criteria

Category Activity	NAC, Hourly A- Weighted Noise Level, $L_{eq}(h)$	Description of Activity Category
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, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit 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.

Notes: $L_{eq}(h)$ = hourly equivalent noise level; NAC = noise abatement criteria
[1] Includes undeveloped lands permitted for this activity category.

Figure 2.2.7-1 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.

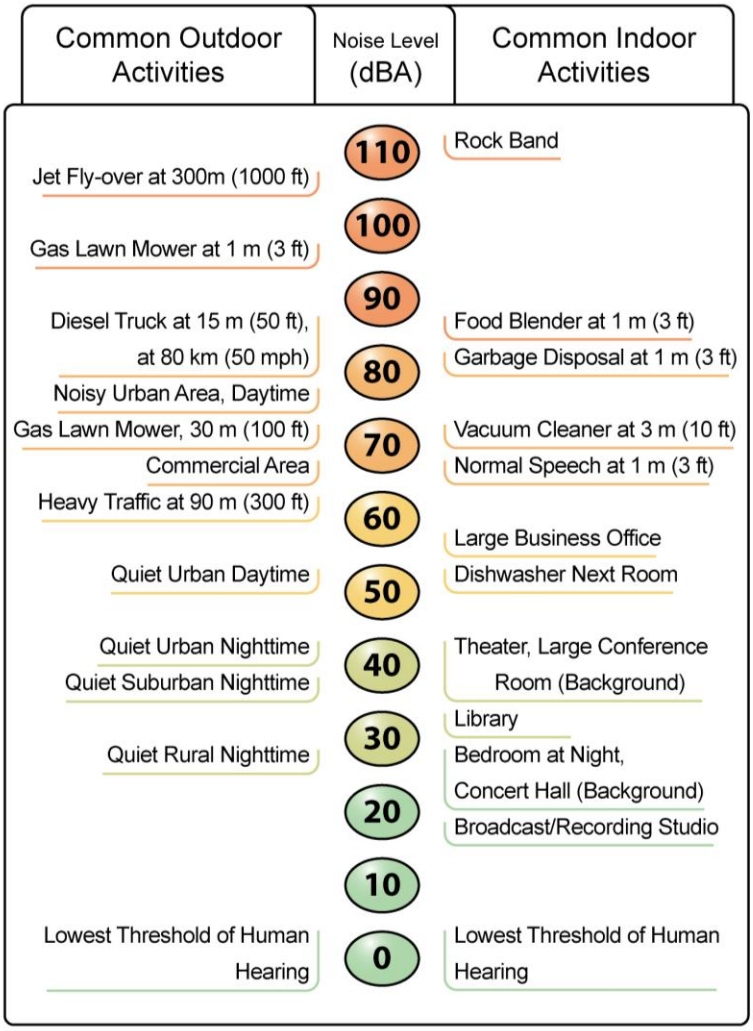


Figure 2.2.7-1. Noise Levels of Common Activities

According to Caltrans' *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) or when the future noise level with the project approaches or exceeds the NAC (California Department of Transportation, 2011). A noise level is considered to approach the NAC if it is 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.

Caltrans' *Traffic Noise Analysis Protocol* sets forth the criteria for determining when an abatement measure is reasonable and feasible (California Department of Transportation, 2020b). Feasibility of noise abatement is basically an engineering concern. Noise abatement must be predicted to reduce noise by at least 5 dB at an impacted receptor to be considered feasible from an acoustical perspective. It must also be possible to design and construct the noise abatement measure for it to be considered feasible. Factors that affect the design and constructability of noise abatement include, but are not limited to, safety, barrier height, topography, drainage, access requirements for driveways, presence of local cross streets, underground utilities, other noise sources in the area, and maintenance of the abatement measure. The overall reasonableness of noise abatement is determined by the following three factors: (1) the noise reduction design goal of 7 dB at one or more impacted receptors; (2) the cost of noise abatement; and (3) the viewpoints of benefited receptors (including property owners and residents of the benefited receptors).

Local Noise Requirements

Section 46000 of the California Health and Safety Code entitles all Californians to a peaceful and quiet environment. Typically, work within Caltrans right-of-way (ROW) is not subject to local noise ordinances; however, Caltrans does work with the construction contractor to meet local requirements where feasible.

City of Martinez

Chapter 8.34 of the *City of Martinez Municipal Code* includes noise standards and regulations for activities within the city. According to Section 8.34.030, noise is considered a public nuisance if it exceeds standards found in Section 8.32.020 or includes the use of specific equipment, including heavy equipment, prior to 7:00 a.m. or after 7:00 p.m., unless otherwise authorized.

City of Pleasant Hill

Chapter 9.15 of the *City of Pleasant Hill Municipal Code* provides prohibitions for noise within the city. This includes prohibiting construction in residential areas prior to 7:30 a.m. and after 7:00 p.m. on weekdays and prior to 9:00 a.m. and after 6:00 p.m. on weekends.

City of Concord

The *City of Concord Municipal Code* restricts construction work hours from 7:30 a.m. to 6:00 p.m. on weekdays and 8:00 a.m. to 5:00 p.m. on weekends (City of Concord Police Department, 2019).

City of Walnut Creek

According to the *City of Walnut Creek General Plan* (City of Walnut Creek, 2006), Interstate 680 (I-680) is the loudest noise source within the city. Title 4, Chapter 6 of the

Walnut Creek Municipal Code, Nuisance, contains noise standards that address excessive, unreasonable, and prolonged noise. Section 4-6.204 prohibits any person from making loud, excessive, or unreasonable noise or sound within the city. This includes noise generated from the excavation of any street or highways that require grading permits. In addition, construction work hours are restricted to between 7:00 a.m. and 6:00 p.m. on weekdays that are not holidays, unless otherwise stated in a grading permit (Section 4-6.203).

Contra Costa County

Contra Costa County does not have a noise ordinance for unincorporated areas. Title 17 of the Contra Costa County Building Regulations Section 716-8.1004 limits certain grading activities to weekdays between the hours of 7:30 a.m. and 5:30 p.m. for operations under a permit that are within 500 feet of residential or commercial occupancies. Exceptions may be allowed through conditions of approval. In addition, Section 7.16-8.1006 requires that operations be controlled to prevent nuisances, including noise nuisances.

Contra Costa County's *2045 General Plan* HS-P14.9 requires effective measures along major transportation corridors to reduce impacts on adjacent land uses (Contra Costa County Department of Conservation, 2024).

Construction Vibration

Caltrans provides guidance to evaluate the effect of construction vibration on structures and for potential human annoyance (California Department of Transportation, 2020c), which is summarized in Table 2.2.7-2. Vibration levels are expressed as inches per second of peak particle velocity (PPV).

Caltrans identifies a vibration limit of 0.5 inch per second PPV as the threshold at which there is a potential risk of damage to new residential and modern commercial/industrial structures, 0.3 inch per second PPV for older residential structures, and a conservative limit of 0.25 inch per second PPV for historic and some old buildings. Impacts on historic properties are discussed in Section 2.1.10, *Cultural Resources*.

Table 2.2.7-2. Reaction of People and Damage to Buildings from Continuous or Frequent Intermittent Vibration Levels

Velocity Level, PPV (in/sec)	Human Reaction	Effect on Buildings
0.01	Barely perceptible	No effect
0.04	Distinctly perceptible	Vibration unlikely to cause damage of any type to any structure
0.08	Distinctly perceptible to strongly perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
0.1	Strongly perceptible	Threshold at which there is a risk of damage to fragile buildings with no risk of damage to most buildings
0.25	Strongly perceptible to severe	Threshold at which there is a risk of damage to historic and some old buildings
0.3	Strongly perceptible to severe	Threshold at which there is a risk of damage to older residential structures
0.5	Severe – Vibrations considered unpleasant	Threshold at which there is a risk of damage to new residential and modern commercial/industrial structures

Source: (Illingworth & Rodkin, Inc., 2024)
Note: PPV= peak particle velocity; in/sec = inches per second

2.2.7.2 Affected Environment

The following discussion is based on the proposed Project's *Noise Study Report* (Illingworth & Rodkin, Inc., 2024) completed in January 2024; the *Initial Evaluation of Acoustic Reflections from Proposed Jones Road Soundwall* Memorandum (Illingworth & Rodkin, 2020); and the *Noise Abatement Decision Report* (NADR), which was revised following the selection of the preferred alternative and completed in December 2024 (California Department of Transportation, 2024).

Noise and Vibration Resource Study Area

The Noise and Vibration Resource Study Area encompasses all developed and undeveloped land uses surrounding the Project Study Limits (PSL), with a focus on noise-sensitive land uses. The PSL is defined in Section 1.2, *Project Location and Setting*, and shown in Figure 1-2 (Project Study Limits). In general, noise-sensitive land uses include areas where serenity and quiet are of extraordinary significance, residential land uses, and other community uses such as hospitals, schools, cemeteries, and parks.

The existing noise environment throughout the Noise and Vibration Resource Study Area varies by location, depending on site characteristics such as proximity of receptors to I-680, other major roadways, or other sources of noise in the area; the relative base elevations of roadways and receptors; and the presence of any intervening structures or barriers.

Land uses in the Noise and Vibration Resource Study Area were identified in the following categories:

- Activity Category B – Residential
- Activity Category C – Active Sports Areas, Parks, Campgrounds, Trails, Recreation Areas, Schools, Places of Worship, and Cemeteries
- Activity Category D (Interior) – Schools, Medical Facilities, Places of Worship
- Activity Category E – Restaurants, Hotels, and Other Developed Land
- Activity Category F – Utilities and Other Developed Land
- Activity Category G – Undeveloped

Activity Categories B, C, D, and E land uses are considered noise-sensitive. Activity Categories F and G land uses are not considered noise-sensitive. Although all developed land uses are evaluated, noise abatement is only considered for areas of frequent human use that would benefit from a lowered noise level.

Field Noise Study

A field noise study was conducted in accordance with the recommended procedures in Caltrans' *Traffic Noise Analysis Protocol* (California Department of Transportation, 2020b). A field investigation to identify land uses that could be subject to traffic and construction noise impacts from the proposed Project was conducted from Monday, April 12, 2021, to Monday, April 19, 2021.

Long-term noise measurements were made at seven locations over approximately 24- to 120-hour periods from the morning on Monday, April 12, 2021, to the morning on Monday, April 19, 2021. Long-term measurements were taken at heights of approximately 10 to 12 feet above ground level. Care was taken to select sites that were affected primarily by traffic noise and to avoid those sites where extraneous noise sources, such as barking dogs or mechanical equipment, could contaminate the noise data. Existing loudest-hour noise levels ($L_{eq[h]}$) ranged at the long-term locations from 60 dBA at two residences within Walnut Creek (68 Kuhl Court and 1660 Lilac Drive) to 80 dBA past the end of 88 Rutherford Lane along northbound I-680 in Martinez, CA.

Short-term noise measurements were made at 63 locations in concurrent time intervals with the data collected at the long-term measurement sites. This method facilitated a direct comparison between both short-term and long-term noise measurements and allowed for the identification of the loudest-hour noise levels at land uses where long-term noise measurements were not made, but where both short-term and long-term measurements are exposed to the same primary noise source. Although 113 short-term measurement locations were initially identified, 12 locations were removed because they were not accessible. In addition, the number of short-term noise measurement locations were further reduced when the PSL were reduced from post mile (PM) 4.4/24.5 to PM R10.0/23.2 in October 2023.

Two or more consecutive 10-minute measurements were made at each noise measurement site. Dominant noise sources were identified and logged. At all locations, noise levels were measured 5 feet above the ground surface and at least 10 feet from structures or barriers. Noise measurement data collected at these locations were used to validate the traffic noise model. Short-term noise measurements varied from 48 dBA in the morning at a private residence between Livorna Road and Stone Valley Road (1394 Casa Vallecita, Alamo) to 73 dBA in the morning at a private residence between Pacheco Boulevard and State Route (SR-) 4 (88 Rutherford Lane, Martinez).

Appendix J.1 provides a summary of noise measurements at all short- and long-term monitoring sites. Figures showing the locations of all receptor and potential noise barrier locations are provided in Appendix J.2.

Traffic Noise Modeling

Following established methods for a traffic noise study, the short-term and long-term measurements, together with the measured traffic conditions, vehicle mix, and site-specific topographical information, were used to determine future noise levels in the

Noise and Vibration Resource Study Area. Arterial roadways were modeled at the posted speed limits for the roadway. Traffic mix information included in the provided traffic volumes along with Caltrans reported mix data was used for both existing and future I-680 scenarios.

Traffic noise levels were predicted using FHWA's Traffic Noise Model, Version 2.5. Due to the model's reliability constraints and inability to accurately calculate noise levels at great distances from the roadway, Caltrans limits noise assessments to approximately 500 feet off the roadway source. Once the model was validated, the loudest-hour traffic noise levels were calculated. The loudest hour is generally characterized by free-flowing traffic at the roadway design speed (i.e., Level of Service [LOS] C/D or better). The highest average traffic volumes on I-680 are predicted to occur during the p.m. peak hour; therefore, p.m. peak hour traffic volumes were used in the model. Based on the available traffic mix information, the average traffic mix for the I-680 mainline north of Alcosta Boulevard is between 93.6 and 97.4 percent autos, between 1.7 and 4.3 percent medium trucks, and between 1.0 and 2.5 percent heavy trucks.

Future Undeveloped Land Use

Caltrans' Traffic Noise Analysis Protocol requires the discussion of future land uses in the vicinity of the Project (California Department of Transportation, 2020b). Most of the land in the vicinity of the PSL is developed. Planned and approved projects were reviewed to identify undeveloped lands for which development is planned, designed, and programmed so that those proposed developments may be considered approved (or a part of the existing conditions) in the Noise Study Report (Illingworth & Rodkin, Inc., 2024). According to the Traffic Noise Analysis Protocol, future development would be considered planned, designed, and programmed once it receives final development approval. The review focused on projects within approximately 500 feet of the Project limits, where traffic noise levels from the improved Project roadways could dominate the noise environment. Projects located beyond this distance were excluded from further analysis.

The following future land uses were considered in the noise modeling:

- Bayview Estates Development, which is planned to be along northbound I-680 in the Vine Hill/Pacheco Boulevard area in unincorporated Contra Costa County (Receptors R433 – R436)
- Cambria Hotel and Suites Development in the city of Pleasant Hill (Receptor R437)
- The Oak Road Townhouse Condominium Project at 2740 Jones Road in unincorporated Contra Costa County (Receptors ST-39 and R438–R442)
- The Walnut Creek Hilton Garden Inn Project (Receptor R481 [pool area]); the project has been approved and is currently under construction.

- The Walnut Creek Transit Village Phase 2 Redesign Project (Receptors R483 and R484).

Human Response to Changes in Noise Levels

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear can discern 1 dB changes in sound levels when exposed to steady, single-frequency ("pure-tone") signals in the mid-frequency (1,000 to 8,000 hertz) 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) that would result in a 3 dB increase in sound would generally be perceived as barely detectable. (Illingworth & Rodkin, Inc., 2024)

Decibels are logarithmic units, and therefore a doubling of sound energy results in a 3 dB increase in sound. However, given a sound level change measured with precise instrumentation, the subjective human perception of a doubling of loudness will usually be different than what is measured. (Illingworth & Rodkin, Inc., 2024)

2.2.7.3 Environmental Consequences

No-Build Alternative

The No-Build Alternative would maintain the current configurations of I-680 in the Noise and Vibration Resource Study Area. Under the No-Build Alternative, the proposed Project would not be constructed, and no impacts from noise or vibration would occur. The No-Build Alternative would also not result in any physical or operational changes; therefore, no noise abatement would be implemented. As depicted in Appendix J.3, *Existing and Predicted Future Noise Levels*, increases in traffic are predicted to increase noise levels slightly over existing conditions by the Project's Design Year (2047).

Build Alternatives (Alternatives 1C, 2, 3, and 5)

Temporary (Construction) Noise Impacts

Noise from construction activities may intermittently dominate the noise environment in the immediate area of construction activities during the Project's construction phases. Noise generated by Project-related construction activities would be a function of the noise levels generated by individual pieces of construction equipment, the type and amount of equipment operating at any given time, the timing and duration of construction activities, the proximity of nearby sensitive land uses, and the presence or lack of shielding at these sensitive land uses. Construction noise levels would vary on a day-to-day basis during each phase of construction, depending on the specific task being completed.

Project construction is anticipated to include the following phases: grubbing/land clearing (including mobilization), grading/excavation, drainage/utilities/sub-grade, and paving. The Build Alternatives would require the construction of retaining walls, sound walls, and the following structures:

- Rudgear Road Undercrossing Bridge Widening (Alternatives 1C, 2, and 3)
- Olympic Boulevard Off-ramp Separation Removal (Alternatives 1C and 3)
- Olympic Boulevard Off-ramp Bridge New Construction (Alternatives 1C and 3)
- Mount Diablo Boulevard Undercrossing Bridge New Construction (Alternatives 1C and 3)
- Ygnacio Valley Road Off-ramp Bridge Column Modification (Alternatives 1C and 3)
- Treat Boulevard Overpass Bridge New Construction (Alternatives 2, 3, and 5)
- Contra Costa Canal Undercrossing Bridge Widening (Alternatives 2, 3, and 5)

Pile driving could be used as a construction method for the foundations of new bridge structures or widened crossings. Construction noise would result primarily from the operation of heavy construction equipment and arrival and departure of heavy-duty trucks.

Table 2.2.7-3 presents noise levels calculated for each major Project construction phase at a distance of 50 feet using FHWA's Roadway Construction Noise Model. This construction noise model includes representative sound levels for the most common types of construction equipment and the approximate usage factors of such equipment, which were developed based on an extensive database of information gathered during the construction of the Central Artery/Tunnel Project in Boston, Massachusetts. In some instances, maximum instantaneous noise levels are calculated to be slightly lower than hourly average noise levels. This occurs because the model reports the maximum instantaneous noise level generated by the loudest single piece of construction equipment, while reporting the hourly average noise levels results from the additive effect of multiple pieces of construction equipment operating simultaneously. Noise generated by construction equipment drops off at a rate of 6 dB per doubling of distance.

Table 2.2.7-3. Noise Level by Construction Phase at 50 Feet

Construction Phase	Maximum Instantaneous Noise Level (L_{max}, dBA)	Hourly Average Noise Level ($L_{eq[h]}$, dBA)
Grubbing/Land Clearing	84	83
Grading/Excavation	85	91
Drainage/Utilities/Sub-Grade	85, 96 [a]	90, 101 [a]
Paving	84	85

Source: (Illingworth & Rodkin, Inc., 2024)
Notes: dBA = A-weighted decibels, L_{max} = maximum sound level, $L_{eq[h]}$ = one-hour equivalent sound level
[a] Noise Levels include Impact Pile Driving. Impact pile driving would occur at Lawrence Way Northbound On-ramp, Rudgear Road Undercrossing, and Retaining Wall RSM-RW2.

Although the overall construction schedule may extend to approximately 2 years under all Build Alternatives, roadway construction activities typically occur for relatively short periods in any specific location as construction proceeds along the Project's alignment. Construction noise would be of concern mostly in areas where heavy construction would be concentrated for extended periods, in areas adjacent to noise-sensitive receptors, where noise levels from individual pieces of equipment are substantially higher than ambient conditions, or when construction activities would occur during noise-sensitive early morning, evening, or nighttime hours.

As indicated in Table 2.2.7-3, most construction phases would generate hourly average noise levels ranging from 83 to 91 dBA $L_{eq[h]}$ at 50 feet, which would exceed ambient daytime noise levels at adjacent land uses by 15 to 20 dBA $L_{eq[h]}$. Average noise levels with impact pile driving would be up to 101 dBA $L_{eq[h]}$ at 50 feet. Receptors shielded by noise barriers would be exposed to a similar increase in noise, albeit at lower overall noise levels because the shielding provided by the existing noise barriers would attenuate construction noise at a similar rate to traffic noise. Maximum instantaneous noise levels would range from 84 to 85 dBA L_{max} at 50 feet without impact driving and up to 96 dBA L_{max} at 50 feet with impact pile driving. With the exception of impact pile driving, and possible nighttime construction involving heavy equipment, construction noise levels would not be expected to exceed the quantitative noise limits established by Caltrans.

Under Section 216 of the *Streets and Highways Code (Noise in Classrooms)*, noise levels are required to not exceed 52 dBA $L_{eq[h]}$ in classrooms, libraries, multipurpose rooms, and spaces used for pupil personnel services of a public or private elementary or secondary school. Under the worst-case conditions, construction noise could exceed 52 dBA $L_{eq[h]}$ for a few days or weeks throughout the 2-year construction period at the following schools: St. Mary School (ST-55), Futures Academy (R161), Las Lomas High School (R220), and Dorris-Eaton School (R267). See Appendix J.2, *Receptors and Noise Barrier Locations*, for the locations of these receptors.

Caltrans Standard Specifications require that construction noise not exceed a maximum sound level of 86 dBA at 50 feet from job site activities between the hours of 9:00 p.m. and 6:00 a.m. In accordance with Measure **NOI-1**, the construction contractor would be required to comply with Standard Special Provision (SSP) Section 14-8.02, which would further reduce the potential for noise impacts resulting from Project construction. SSP 14-8.02 requires that the construction contractor not exceed 52 dBA (interior) and the development of a noise control plan (NCP) as well as noise monitoring during construction. The NCP submitted by the contractor should include noise control measures to maintain noise levels and corrective actions if noise levels are exceeded during construction. As such, Measure **NOI-1** would avoid and minimize impacts to noise-sensitive receptors.

Temporary (Construction) Vibration Impacts

Construction activities with the greatest potential to generate perceptible vibration levels would include the removal of pavement and soil, dropping heavy objects, and moving heavy tracked equipment. Table 2.2.7-4 presents typical vibration levels that could be expected from representative construction equipment at a reference distance of 25 feet and calculated vibration levels at distances representative of the setbacks from the Project to the nearest structures. Vibration levels are highest close to the source, and then attenuate with increasing distance, depending on soil conditions.

Table 2.2.7-4. Vibration Source Levels for Construction Equipment

Equipment		PPV at 25 feet (in/sec)	Representative of Setbacks of Nearest Structures (in/sec PPV) [1]	
			50 feet	100 feet
Pile Driver (Impact)	upper range	1.158	0.540	0.252
	typical	0.644	0.300	0.140
Pile Driver (Sonic)	upper range	0.734	0.342	0.160
	typical	0.17	0.079	0.037
Clam shovel drop		0.202	0.094	0.044
Hydromill (slurry wall)	in soil	0.022	0.004	0.002
	in rock	0.047	0.008	0.004
Vibratory Roller		0.210	0.098	0.046
Hoe Ram		0.089	0.042	0.019
Large bulldozer		0.089	0.042	0.019
Caisson drilling		0.089	0.042	0.019
Loaded trucks		0.076	0.035	0.017

Equipment	PPV at 25 feet (in/sec)	Representative of Setbacks of Nearest Structures (in/sec PPV) [1]	
		50 feet	100 feet
Jackhammer	0.035	0.016	0.008
Small bulldozer	0.003	0.001	0.001

Source: (Illingworth & Rodkin, Inc., 2024)
Notes: in/sec = inches per second, ppv = peak particle velocity
[1] These levels calculated assuming normal propagation conditions, using a standard equation of *PPVeqmt-PPVref * (25/D)*.

Caltrans recommends a vibration limit of 0.5 inch per second PPV for new residential and modern commercial/industrial structures, 0.3 inch per second PPV for older residential structures, and 0.25 inch per second PPV for historic and some old buildings. Distances to vibration limit exceedances for various structure types are shown in Table 2.2.7-5.

Table 2.2.7-5. Distance to Exceedance of Vibration Limit by Structure Type

Structure Type	Threshold	Distance to Exceedance of Threshold, feet [1]	
		Impact Pile Driving	Heavy Construction
Historic Buildings	0.25 in/sec PPV	100 feet	22 feet
Older Residences	0.3 in/sec PPV	85 feet	18 feet
New Residential and Commercial/ Industrial Buildings	0.5 in/sec PPV	55 feet	12 feet

Source: (Illingworth & Rodkin, Inc., 2024)
Notes: in/sec = inches per second, ppv = peak particle velocity
[1] These levels calculated assuming normal propagation conditions, using a standard equation of *PPVeqmt-PPVref * (25/D)*.

Impact pile driving located within 100 feet of historic buildings and heavy construction located within 22 feet of historic buildings and would have the potential to exceed the 0.25 in/sec PPV threshold. Based on a review of the Contra Costa County, Martinez, Pleasant Hill, Walnut Creek, Danville, and San Ramon historic resource inventories/mapping, there are no historic buildings located within 100 feet of the Project limits that would be susceptible to vibration. The normal forces that the Contra Costa Canal, Mokelumne Aqueduct, and BART are subject to on a daily basis would be well above any vibration expected from the proposed Project. Therefore, vibration levels due to project construction activities would not exceed the 0.25 in/sec PPV threshold at sensitive historic buildings in the vicinity of the project alignment. Impacts on historic structures are further addressed in Section 2.1.10, *Cultural Resources*.

Impact pile driving within 85 feet of older residential structures or within 55 feet of new residential and modern commercial/industrial structures and heavy construction located within 18 feet of older residential structures or within 12 feet of new residential and modern commercial/industrial structures would have the potential to exceed the 0.3 and 0.5 inch per second PPV thresholds, respectively.

Impact pile driving may be required at the following three locations along the Project corridor: the Lawrence Way Northbound On-ramp Undercrossing (Alternatives 2, 3, and 5); retaining wall RSM-RW2, located north of Rudgear Road (Alternatives 1C, 2, and 3); and the Rudgear Road Undercrossing Widening (Alternatives 1C, 2, and 3).

Walnut Creek Parks Division industrial buildings in Walnut Creek at 511 Lawrence Way would be located approximately 42 to 52 feet south of foundation piles required for the Lawrence Way Northbound On-ramp Undercrossing. Vibration levels of 0.5 inch per second PPV could potentially be exceeded by the upper range of pile driving when located within 55 feet of adjacent industrial structures in the vicinity of the Lawrence Way Northbound On-ramp Undercrossing. Heavy construction may also occur within 18 feet of sensitive structures in this area. Measure **VIB-1**, which requires cast-in-drilled-hole (CIDH) piles to be used near vibration-sensitive structures, among other things, would be implemented to minimize the potential for vibration impacts resulting from Project construction.

Residential apartment buildings in Walnut Creek at 125 Near Court, 1309 Creekside Drive, 1335 Creekside Drive, and 1355 Creekside Drive would be located approximately 11 to 48 feet east of piles required for retaining wall RSM-RW2. Vibration levels of 0.5 inch per second PPV could potentially be exceeded by the upper range of pile driving when located within 55 feet of adjacent residential structures in the vicinity of proposed retaining wall RSM-RW2. Heavy construction may also occur within 18 feet of sensitive structures in this area. Measure **VIB-1** would be implemented to minimize the potential for vibration impacts resulting from Project construction.

There are no residences, commercial buildings, or industrial buildings within 230 feet of the piles that would be driven as part of the Rudgear Road Undercrossing Bridge Widening proposed under Alternatives 1C, 2, and 3. Neither impact pile driving nor heavy construction would produce vibration levels exceeding the vibration thresholds at the nearest buildings to that undercrossing. Alternative 5 would not widen the Rudgear Road Undercrossing Bridge.

Long-Term (Operational) Noise Impacts

The comparison between the Build and the No-Build conditions in the Project's Design Year (2047) indicates the Project's direct long-term effects. The Project's Design Year is defined as 20 years after the Project's anticipated Opening Year (2027).

This Project has been determined to be a Type I project, per 23 CFR 772. For the purposes of 23 CFR 772, a noise impact occurs when either (1) there is a substantial

noise increase between Design Year build conditions and existing conditions, or (2) the Design Year build traffic noise level approaches or exceeds the FHWA NAC.

Section 3 of the Caltrans *Traffic Noise Analysis Protocol* defines a noise increase as "substantial" when the predicted noise levels with Project implementation would exceed existing noise level conditions by 12 dBA or more (California Department of Transportation, 2020b).

FHWA's NAC for a receptor is based on its land use activity category and is provided in Table 1 to 23 CFR 772 (see Table 2.2.7-1). The Protocol defines "approach" as being within 1 dBA of the NAC. For example, if the NAC is 67 dBA, a predicted noise level of 66 dBA is considered to "approach" the NAC.

As described above, noise levels were modeled for the Project's Design Year at 63 short-term noise monitoring locations (referred to as Receptors ST-2 through ST-78).[1] An additional 295 modeled receiver locations within the Noise and Vibration Resource Study Area were also modeled.[2] Figures showing the short-term noise measurement and modeled receiver locations are provided in Appendix J.1, *Summary of Noise Measurements*.

Table J-3 through Table J-6 in Appendix J.3, *Existing and Predicted Future Noise Levels*, provide the predicted noise levels for each noise measure location and modeled receiver under Alternatives 1C, 2, 3, and 5, respectively. Noise levels are estimated to increase by 0 to 2 dBA over existing conditions in the Design Year (2047) without the Project. Alternative 1C is anticipated to increase Design Year (2047) noise levels by -2 to 11 dBA over existing conditions. Alternatives 2 and 3 are anticipated to increase Design Year noise levels by -2 to 9 dBA over existing conditions. Meanwhile, Alternative 5 is anticipated to increase Design Year noise levels by -2 to 3 dBA over existing conditions. Therefore, noise levels under all Build Alternatives would not exceed existing noise levels substantially (defined as 12 dBA or more) (California Department of Transportation, 2011).

Noise abatement is being considered in accordance with 23 CFR 772. Under Alternative 1C, projected highway noise levels for the Design Year are expected to approach or exceed the NAC at 47 Category B receptors and 7 Category C receptors. Under Alternative 2, projected highway noise levels for the Design Year are expected to approach or exceed the NAC at 50 Category B receptors and 7 Category C receptors.

[1] One hundred thirteen short-term noise measurements, ST-1 through ST-113 were identified along the initial Project corridor. Short-term measurement locations ST-8, ST-10, ST-15, ST-16, ST-25, ST-40, ST-47, and ST-68 were removed because they were not accessible. Short-term measurement locations ST-1 and ST-73 through ST-113 were removed when the PSL were reduced in October 2023.

[2] Receptors R1 through R480 were identified. Receptor R488 was skipped and Receptors R1-R2, R257, R266- R431, R443-R446, R447, and R466-R475 were removed when the PSL were reduced in October 2023.

Under Alternative 3, projected highway noise levels for the Design Year are expected to approach or exceed the NAC at 53 Category B receptors and 6 Category C receptors. Under Alternative 5, projected highway noise levels for the Design Year are expected to approach or exceed the NAC at 38 Category B receptors and 6 Category C receptors. Traffic noise levels are not predicted to approach or exceed the NAC at any Category D receptors (inside the structure) or Category E receptors under any Build Alternative. Noise abatement is further discussed below in Section 2.2.7.5, *Preliminary Traffic Noise Abatement Evaluation*.

2.2.7.4 Summary

*Alternative 2 has been selected as the preferred alternative. Alternative 2 is anticipated to increase Design Year noise levels by -2 to 9 dBA over existing conditions without abatement. Therefore, permanent noise impacts without abatement would not be considered substantial (defined as 12 dBA or more). However, noise abatement has been considered for the Project in accordance with 23 CFR 772. As discussed in more detail below, thirteen noise barriers were evaluated for feasibility and acoustical reasonableness under Alternative 2. Noise Barrier System (E.1/SW No. 4/M242-RW1/E.3/SW No. 3) and Evaluated Barrier 2 are recommended for construction. In addition, the construction contractor would be required to prepare a Noise Control Plan (**NOI-1**) and implement measures to reduce potential vibratory impacts (**NOI-2**) during construction. Therefore, Alternative 2 would not adversely affect noise or vibration.*

2.2.7.5 Avoidance, Minimization, and/or Abatement Measures

Preliminary Traffic Noise Abatement Evaluation

Noise abatement is considered where noise impacts are predicted in areas of frequent human use that would benefit from a lowered noise level. Noise abatement must be predicted to provide at least a 5 dB reduction at an impacted receptor to be considered acoustically feasible by Caltrans (i.e., the barrier would provide a noticeable noise reduction). In addition, the noise barrier must provide at least 7 dB of noise reduction at one or more benefited receptors (California Department of Transportation, 2020b). Noise abatement measures that provide noise reduction of more than 5 dB are encouraged, as long as they meet the reasonableness guidelines. Cost considerations for determining noise abatement reasonableness are based on an allowance per benefited receptor. For each acoustically feasible noise barrier, reasonable monetary allowances were calculated by multiplying the number of benefited receptors by $146,000, which is Caltrans' base cost allowance for 2023 reasonable/feasible analysis.

According to 23 CFR 772(13)(c) and 772(15)(c), federal funding may be used for the following abatement measures:

- Noise barriers construction, including acquisition of property rights, either within or outside State ROW.

- 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 that would be adversely impacted by traffic noise.
- Noise insulation of Activity Category D land use facilities. Post-installation maintenance and operational costs for noise insulation are not eligible for federal-aid funding.

Noise barriers are the only form of noise abatement considered for exterior land uses in the Noise and Vibration Resource Study Area. Caltrans typically limits noise barrier heights to between 6 and 16 feet due to seismic considerations (California Department of Transportation, 2020a). Noise barriers should not exceed 14 feet in height (measured from the pavement surface at the face of the safety-shape barrier) when located 15 feet or less from the edge of the traveled way. Noise barriers should not exceed 16 feet in height above the ground line when located more than 15 feet from the traveled way.

Receiver and noise barrier locations are shown in Appendix J.2, Receptors and Noise Barrier Locations. More information regarding existing and evaluated barriers is provided below in the Preliminary Noise Abatement Analyses section. The Preliminary Noise Abatement Decisions section provides Caltrans' recommended abatement for each Build Alternative based on the Project's Draft NADR findings (California Department of Transportation, 2024).

The views and opinions of the residents living adjacent to the proposed improvements and affected by the traffic noise would be considered in reaching a decision on noise abatement measures. Caltrans' policy is to not provide noise barriers if 50 percent or more of those affected residents do not want them. The opinions of these residents would be obtained through public and community meetings or other means, as appropriate, prior to final Project design.

The noise barrier designs presented in this environmental document are preliminary and have been conducted at a level appropriate for environmental review but not for final Project design. Preliminary information on the physical location, length, and height of noise barriers is provided below. If pertinent parameters change substantially during the final Project design, preliminary noise barrier designs may be modified or eliminated from the final Project. A final decision on the construction of noise barriers will be made upon completion of the Project design.

Preliminary Noise Abatement Analyses

At Arthur Road Along Southbound I-680 (Evaluated Barrier 1)

Outdoor areas of the residences west of Arthur Road, represented by Receptors ST-6, ST-7, R14, and R15, were identified for noise abatement because modeled Design Year (2047) Build condition noise levels would approach or exceed the NAC at Receptor R15 under all Build Alternatives. Evaluated Barrier 1 was modeled along I-680 southbound travel lanes to extend approximately 630 feet.

Table 2.2.7-6 through Table 2.2.7-8 show the Design Year (2047) Build condition noise levels and insertion loss for Evaluated Barrier 1 at various design heights for each Build Alternative. Evaluated Barrier 1 would not feasibly abate traffic noise or meet the 7 dB noise reduction goal at impacted receptor R15, even at a height of 16 feet. Therefore, reasonable allowances were not calculated for Evaluated Barrier 1 under any of the Build Alternatives.

Table 2.2.7-6. Evaluated Barrier 1 Alternative 1C

Barrier I.D.: Evaluated Barrier 1 Alternative 1C														
Receptor ID	Units Represented	Horizon Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-6	6	64	63	1	62	2	61	3	61	3	60	4	60	4
ST-7	7	57	57	0	56	1	56	1	56	1	56	1	56	1
R14	4	57	55	2	55	2	54	3	53	4	53	4	53	4
R15	4	66	64	2	64	2	63	3	62	4	62	4	62	4

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Table 2.2.7-7. Evaluated Barrier 1 Alternatives 2 and 3

Barrier I.D.: Evaluated Barrier 1 Alternatives 2 and 3														
Receptor ID	Units Represented	Horizon Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-6	6	64	63	1	62	2	61	3	61	3	60	4	60	4
ST-7	7	57	57	0	56	1	56	1	56	1	56	1	56	1
R14	4	57	54	3	54	3	53	4	52	5	52	5	52	5
R15	4	66	64	2	64	2	63	3	62	4	62	4	62	4

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss, H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Table 2.2.7-8. Evaluated Barrier 1 Alternative 5

Barrier I.D.: Evaluated Barrier 1 Alternative 5														
Receptor ID	Units Represented	Horizon Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-6	6	64	63	1	62	2	61	3	61	3	60	4	60	4
ST-7	7	56	56	0	55	1	55	1	55	1	55	1	55	1
R14	4	57	54	3	54	3	53	4	52	5	52	5	52	5
R15	4	66	64	2	64	2	63	3	62	4	62	4	62	4

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

At Arthur Road Along Northbound I-680 (Existing Barriers A.1 and A.2)

The outdoor areas of Marlin's RV Park were identified for noise abatement because Design Year (2047) Build condition noise levels would exceed the NAC under all Build Alternatives. Receptors ST-9 and R36 were identified for noise abatement under Alternatives 1C and 2. Receptors ST-9, R16, R17, and R36 were identified for noise

abatement under Alternatives 3 and 5. Receptors in the area are shielded from I-680 by an existing 11-foot-high noise barrier (Existing Barriers A.1 and A.2) located along the I-680 northbound travel lanes.

As summarized in Table 2.2.7-9 and Table 2.2.7-10, Existing Barriers A.1 and A.2 were calculated to provide 5 dB of noise reduction at ST-9, therefore meeting the noise reduction standard for feasibility. The barriers were calculated to provide noise reduction at other receptors in the area meeting the noise reduction design goal. Existing Barriers A.1 and A.2 meet the noise reduction standard for feasibility and the noise reduction design goal. Based on these results, these barriers are not studied further. Existing Barriers A.1 and A.2 would feasibly abate traffic noise and meet the 7 dB design goal at the existing height of 11 feet.

Table 2.2.7-9. Existing Barriers A.1 and A.2 Alternatives 1C, 2, and 3

Barrier I.D.: Existing Barriers A.1 and A.2 Alternatives 1C, 2, and 3				
Receptor ID	Units Represented	Horizon Year (2047) Noise Level w/o Wall	With Existing Wall H=11 feet	
			$L_{eq[h]}$	I.L.[1]
ST-9	1	73	68	5
R16	1	67	60	7
R17	1	64	61	3
R36	1	71	67	4

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Table 2.2.7-10. Existing Barriers A.1 and A.2 Alternative 5

Barrier I.D.: Existing Barriers A.1 and A.2 Alternative 5				
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Existing Wall H=11 feet	
			$L_{eq[h]}$	I.L.[1]
ST-9	1	73	68	5
R16	1	67	60	7
R17	1	64	61	3
R36	1	71	66	5

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Northwest of I-680 and SR-4 Interchange Along Northbound I-680 (Existing Barrier B)

The private outdoor areas of residences west of Blum Road, represented by Receptors R28–R31 and R35, were identified for noise abatement because Design Year (2047) Build condition noise levels would exceed the NAC under all Build Alternatives at Receptor R28. Receptors in the area are shielded from I-680 by an existing, 12-foot-high noise barrier (Existing Barrier B), which is located along the I-680 northbound travel lanes.

As summarized in Table 2.2.7-11 and Table 2.2.7-12, existing Barrier B was calculated to provide 7 dB of noise reduction under Alternative 1C and 8 dB of noise reduction under Alternatives 2, 3, and 5 at Receptor R31, therefore meeting the noise reduction standard for feasibility and the noise reduction design goal. Based on these results, this barrier is not studied further in this assessment. Existing Barrier B would feasibly abate traffic noise and meet the 7 dB design goal at its existing height of 12 feet.

Table 2.2.7-11. Existing Barrier B Alternative 1C

Barrier I.D.: Existing Barrier B Alternative 1C				
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Existing Wall H=12 feet	
			$L_{eq[h]}$	I.L.[1]
R28	4	77	73	4
R29	6	65	65	0
R30	6	60	60	0
R31	1	68	61	7
R35	1	67	66	1

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Table 2.2.7-12. Existing Barrier B Alternatives 2, 3, and 5

Barrier I.D.: Existing Barrier B Alternatives 2, 3, and 5				
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Existing Wall H=12 feet	
			$L_{eq[h]}$	I.L.[1]
R28	4	77	72	5
R29	6	65	64	1
R30	6	60	59	1
R31	1	69	61	8
R35	1	67	63	4

Barrier I.D.: Existing Barrier B Alternatives 2, 3, and 5				
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Existing Wall H=12 feet	
			$L_{eq[h]}$	I.L.[1]

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

At Concord Avenue/Chilpancingo Parkway (Evaluated Barrier 18)

Buchanan Fields Golf Course, represented by Receptor ST-20, has been identified for noise abatement because modeled Design Year (2047) Build condition noise levels would approach or exceed the NAC under all Build Alternatives. Evaluated Barrier 18 was modeled along the Concord Avenue I-680 Northbound On-ramp, extending approximately 1,500 feet.

Table 2.2.7-13 and Table 2.2.7-14 show the Design Year (2047) Build condition noise levels and insertion loss for Evaluated Barrier 18 at various design heights under each Build Alternative. Evaluated Barrier 18 would feasibly abate traffic noise at a height of 14 feet but would not meet the 7 dB noise reduction goal at impacted Receptor ST-20, even at a height of 16 feet. Therefore, reasonable allowances were not calculated for Evaluated Barrier 18.

Table 2.2.7-13. Evaluated Barrier 18 Alternative 1C

Barrier I.D.: Evaluated Barrier 18 Alternative 1C														
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-20	1	70	69	1	69	1	68	2	66	4	65	5	64	6

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Table 2.2.7-14. Evaluated Barrier 18 Alternatives 2, 3, and 5

Barrier I.D.: Evaluated Barrier 18 Alternatives 2, 3, and 5														
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-20	1	71	70	1	70	1	69	2	67	4	66	5	65	6

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Between SR-242 and Monument Boulevard Along Southbound I-680 (Existing Barrier D)

The private outdoor areas of residences east of Contra Costa Boulevard were identified for noise abatement because Design Year (2047) Build condition noise levels would exceed the NAC under all Build Alternatives. Receptors R78, R79, R80, and R81 were identified for noise abatement under Alternatives 1C, 2, and 3. Receptors R76 through R89 were identified for noise abatement because Design Year (2047) Alternative 5 Build condition noise levels would exceed the NAC at Receptors R78, R79, and R80. A trail, represented by Receptor ST-28, has been identified for noise abatement because Design Year (2047) Build condition noise levels would exceed the NAC under all Build Alternatives. Receptors in the area are shielded from I-680 by an existing 14-foot-high noise barrier (Existing Barrier D) located along I-680 southbound travel lanes.

As summarized in

Table 2.2.7-15 and Table 2.2.7-16, existing Barrier D was calculated to provide at least 5 dB of noise reduction, therefore meeting the noise reduction standard for feasibility. The barrier was calculated to provide 7 dB of noise reduction at ST-28, therefore meeting the noise reduction design goal. Existing Barrier D meets the noise reduction standard for feasibility and the noise reduction design goal. Based on these results, this barrier was not studied further. Existing Barrier D would feasibly abate traffic noise and meet the 7 dB design goal at its existing 14-foot height.

Table 2.2.7-15. Existing Barrier D Alternatives 1C, 2, and 3

Barrier I.D.: Existing Barrier D Alternatives 1C, 2, and 3				
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Existing Wall H=14 feet	
			$L_{eq[h]}$	I.L.[1]
ST-24	1	68	67	1
ST-28	1	75	68	7
R76	4	64	62	2
R77	4	71	65	6
R78	13	72	67	5
R79	8	73	67	6
R80	3	72	67	5
R81	2	68	66	2
R82	8	65	62	3
R83	6	60	59	1
R84	4	62	60	2
R85	4	62	60	2
R86	6	60	58	2
R87	5	60	59	1
R88	4	63	60	3
R89	3	58	57	1

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Table 2.2.7-16. Existing Barrier D Alternative 5

Barrier I.D.: Existing Barrier D Alternative 5				
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Existing Wall H=14 feet	
			$L_{eq[h]}$	I.L.[1]
ST-24	1	67	66	1
ST-28	1	75	68	7
R76	4	65	62	3
R77	4	71	65	6
R78	13	72	66	6
R79	8	73	67	6
R80	3	71	66	5
R81	2	67	65	2
R82	8	64	61	3
R83	6	60	58	2
R84	4	62	60	2
R85	4	62	59	3
R86	6	59	58	1
R87	5	60	58	2
R88	4	63	60	3
R89	3	58	56	2

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Between SR-242 and Monument Boulevard Along Northbound I-680 (Existing Barrier E.1, SW No. 4, M242-RW1, Existing Barrier E.3, SW No. 3):

The private outdoor areas of residences south of SR-242, represented by Receptors ST-26, ST-27, ST-29, R70 through R75, and R90 through R103, are currently shielded

from I-680 by an existing 14-foot-high noise barrier (Existing Barrier E.1), a 15-foot-high berm (Existing Barrier E.2), and 14-foot-high noise barrier (Existing Barrier E.3). Alternatives 1C, 2, and 3 would remove and replace a portion of Existing Barrier E.1 with Barrier SW No. 4, the berm (exiting Barrier E.2) would be cut into and retaining wall M242-RW1 would be added, and a portion of Existing Barrier E.3 would be removed and replaced with Barrier SW No. 3.

Table 2.2.7-17 through Table 2.2.7-19 show the Design Year (2047) Build condition noise levels and insertion loss for Existing Barrier E.1, retaining wall M242-RW1, Existing Barrier E.3, and Barrier SW No. 3 under Alternatives 1C, 2, and 3. Existing Barrier E.1, Barrier SW No. 4, retaining wall M242-RW1, Existing Barrier E.3, and Barrier SW No. 3 would feasibly abate traffic noise at a minimum height of 8 feet and would meet the 7 dB design goal at a height of 14 feet. Therefore, the barrier system consisting of Existing Barrier E.1, Barrier SW No. 4, retaining wall M242-RW1, Existing Barrier E.3, and Barrier SW No. 3 was carried forward into the Draft NADR and is further described below in the *Preliminary Noise Abatement Decision* section. The reasonable allowance calculated for a 14-foot barrier or greater was $749,000.

Table 2.2.7-17. Existing Barrier E.1, SW No. 4, M242-RW1, Existing Barrier E.3, SW No. 3 Alternative 1C

Barrier I.D.: Existing Barrier E.1, SW No. 4, M242-RW1, Existing Barrier E.3, SW No. 3 Alternative 1C														
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-26	9	62	61	1	61	1	60	2	60	2	60	2	59	3
ST-27	10	59	59	0	59	0	59	0	59	0	59	0	59	0
ST-29	0	64	64	0	64	0	64	0	64	0	64	0	64	0
R70	1	69	68	1	67	2	67	2	67	2	67	2	67	2
R71	6	58	56	2	55	3	55	3	54	4	54	4	54	4
R72	5	53	53	0	52	1	52	1	52	1	52	1	51	2
R73	7	53	53	0	53	0	52	1	52	1	52	1	52	1
R74	5	53	53	0	53	0	53	0	53	0	52	1	52	1
R75	6	52	51	1	50	2	50	2	50	2	50	2	50	2
R90	7	66	62	4	61	5	60	6	60	6	59	7	59	7
R91	16	66	66	0	66	0	66	0	66	0	66	0	66	0

Barrier I.D.: Existing Barrier E.1, SW No. 4, M242-RW1, Existing Barrier E.3, SW No. 3 Alternative 1C													
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
R92	10	67	67	0	67	0	67	0	67	0	67	0	67	0
R93	10	66	66	0	66	0	66	0	66	0	66	0	66	0
R94	11	66	66	0	66	0	66	0	66	0	66	0	66	0
R95	5	64	64	0	64	0	64	0	64	0	64	0	64	0
R96	3	68	68	0	68	0	68	0	68	0	68	0	68	0
R97	3	64	64	0	64	0	64	0	64	0	64	0	64	0
R98	10	64	64	0	64	0	64	0	64	0	64	0	64	0
R99	8	64	64	0	64	0	64	0	64	0	64	0	64	0
R100	10	59	59	0	59	0	59	0	59	0	59	0	59	0
R101	9	58	57	1	57	1	57	1	57	1	57	1	57	1
R102	5	59	57	2	57	2	57	2	57	2	57	2	56	3
R103	4	62	62	0	62	0	62	0	62	0	62	0	62	0

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Table 2.2.7-18. Existing Barrier E.1, SW No. 4, M242-RW1, Existing Barrier E.3, SW No. 3 Alternative 2

Barrier I.D.: Existing Barrier E.1, SW No. 4, M242-RW1, Existing Barrier E.3, SW No. 3 Alternative 2														
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-26	9	62	61	60	1	60	1	59	2	59	2	59	2	59
ST-27	10	59	57	57	0	57	0	57	0	57	0	57	0	57

Barrier I.D.: Existing Barrier E.1, SW No. 4, M242-RW1, Existing Barrier E.3, SW No. 3 Alternative 2														
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-29	0	64	64	64	0	64	0	64	0	64	0	64	0	64
R70	1	69	68	67	1	66	2	66	2	66	2	66	2	66
R71	6	58	57	55	2	54	3	54	3	53	4	53	4	53
R72	5	53	53	53	0	52	1	52	1	52	1	52	1	51
R73	7	53	53	53	0	53	0	52	1	52	1	52	1	52
R74	5	53	52	52	0	52	0	52	0	52	0	51	1	51
R75	6	52	52	51	1	50	2	50	2	50	2	50	2	50
R90	7	66	66	62	4	61	5	60	6	60	6	59	7	59
R91	16	66	66	66	0	66	0	66	0	66	0	66	0	66
R92	10	67	67	67	0	67	0	67	0	67	0	67	0	67
R93	10	66	66	66	0	66	0	66	0	66	0	66	0	66
R94	11	66	66	66	0	66	0	66	0	66	0	66	0	66
R95	5	64	64	64	0	64	0	64	0	64	0	64	0	64
R96	3	68	68	68	0	68	0	68	0	68	0	68	0	68
R97	3	64	64	64	0	64	0	64	0	64	0	64	0	64
R98	10	64	64	64	0	64	0	64	0	64	0	64	0	64
R99	8	64	64	64	0	64	0	64	0	64	0	64	0	64
R100	10	59	59	59	0	59	0	59	0	59	0	59	0	59
R101	9	58	58	57	1	57	1	57	1	57	1	57	1	57
R102	5	59	59	57	2	57	2	57	2	57	2	57	2	56
R103	4	62	62	62	0	62	0	62	0	62	0	62	0	62

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Table 2.2.7-19. Existing Barrier E.1, SW No. 4, M242-RW1, Existing Barrier E.3, SW No. 3 Alternative 3

Barrier I.D.: Existing Barrier E.1, SW No. 4, M242-RW1, Existing Barrier E.3, SW No. 3 Alternative 3														
Receptor ID	Units Represented	Design Year (2047) Noise Level	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-26	9	61	60	1	60	1	59	2	59	2	59	2	59	2
ST-27	10	57	57	0	57	0	57	0	57	0	57	0	57	0
ST-29	0	64	64	0	64	0	64	0	64	0	64	0	64	0
R70	1	67	66	1	65	2	65	2	65	2	65	2	65	2
R71	6	56	55	1	54	2	53	3	53	3	52	4	52	4
R72	5	53	53	0	52	1	52	1	52	1	52	1	51	2
R73	7	53	53	0	53	0	52	1	52	1	52	1	52	1
R74	5	52	52	0	52	0	52	0	52	0	51	1	51	1
R75	6	52	51	1	50	2	50	2	50	2	50	2	50	2
R90	7	66	62	4	61	5	60	6	60	6	59	7	59	7
R91	16	66	66	0	66	0	66	0	66	0	66	0	66	0
R92	10	67	67	0	67	0	67	0	67	0	67	0	67	0
R93	10	66	66	0	66	0	66	0	66	0	66	0	66	0
R94	11	66	66	0	66	0	66	0	66	0	66	0	66	0
R95	5	64	64	0	64	0	64	0	64	0	64	0	64	0
R96	3	68	68	0	68	0	68	0	68	0	68	0	68	0
R97	3	64	64	0	64	0	64	0	64	0	64	0	64	0
R98	10	64	64	0	64	0	64	0	64	0	64	0	64	0
R99	8	64	64	0	64	0	64	0	649	0	64	0	64	0
R100	10	59	59	0	59	0	59	0	59	0	59	0	59	0
R101	9	58	57	1	57	1	57	1	57	1	57	1	57	1
R102	5	59	57	2	57	2	57	2	57	2	57	2	56	3

Barrier I.D.: Existing Barrier E.1, SW No. 4, M242-RW1, Existing Barrier E.3, SW No. 3 Alternative 3														
Receptor ID	Units Represented	Design Year (2047) Noise Level	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
R103	4	62	62	0	62	0	62	0	62	0	62	0	62	0

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Unlike Alternatives 1C, 2, and 3, Alternative 5 would not require the replacement of Barriers E.1, E.2, or E.3. The private outdoor areas of residences south of SR-242, represented by Receptors ST-26, ST-27, ST-29, R70 through R75, and R90 through R103, have been identified for noise abatement because Design Year (2047) Build condition noise levels would exceed the NAC at Receptors R90, R92, and R96 under Alternative 5. Receptors R90, R92, and R96 are currently shielded from I-680 by an existing, 14-foot-high noise barrier (Existing Barrier E.1), a 15-foot-high berm (Existing Barrier E.2) and an existing 14-foot-high noise barrier (Existing Barrier E.3).

As summarized in Table 2.2.7-20, existing Barriers E.1, E.2, and E.3 were calculated to provide 5 dB of noise reduction at R72, R94, R102, and R103, therefore meeting the noise reduction standard for feasibility. The barrier was calculated to provide 7 dB of noise reduction at ST-29 and R71, 9dB of noise reduction at R93, 11 dB of noise reduction at R90, and 14 dB of noise reduction at R70, therefore meeting the noise reduction design goal. Based on these results, this barrier is not studied further in this assessment. Existing Barriers E.1, E.2, and E.3 would feasibly abate traffic noise and meet the 7 dB design goal at its existing height of 14 to 15 feet.

Table 2.2.7-20. Existing Barriers E.1, E.2, an E.3 Alternative 5

Barrier I.D.: Existing Barriers E.1, E.2, and E.3 Alternative 5				
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Existing Wall H=14 feet	
			$L_{eq[h]}$	I.L.[1]
ST-26	9	61	57	4

Barrier I.D.: Existing Barriers E.1, E.2, and E.3 Alternative 5				
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Existing Wall H=14 feet	
			$L_{eq[h]}$	I.L.[1]
ST-27	10	57	55	2
ST-29	0	70	63	7
R70	1	76	62	14
R71	6	57	50	7
R72	5	54	49	5
R73	7	54	50	4
R74	5	52	50	2
R75	6	52	48	4
R90	7	77	66	11
R91	16	69	65	4
R92	10	69	66	3
R93	10	74	65	9
R94	11	70	65	5
R95	5	66	63	3
R96	3	70	68	2
R97	3	64	63	1
R98	10	65	64	1
R99	8	66	63	3
R100	10	61	58	3
R101	9	60	58	2
R102	5	63	58	5
R103	4	67	62	5

Barrier I.D.: Existing Barriers E.1, E.2, and E.3 Alternative 5				
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Existing Wall H=14 feet	
			$L_{eq[h]}$	I.L.[1]

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

At Sunnyvale Avenue (Evaluated Barrier 19)

The private, second floor outdoor areas of residences along the N Main Street I-680 Southbound Off-ramp, represented by Receptor R129, have been identified for noise abatement because modeled Design Year (2047) Build condition noise levels would approach or exceed the NAC under all Build Alternatives. Evaluated Barrier 19 was modeled along the N Main Street I-680 Southbound Off-ramp, extending approximately 400 feet.

Table 2.2.7-21 shows the Design Year (2047) Build condition noise levels and insertion loss for Evaluated Barrier 19 at various design heights under all Build Alternatives. Evaluated Barrier 19 would not feasibly abate traffic noise or meet the 7 dB noise reduction goal at impacted receptor R129, even at a height of 16 feet. Therefore, reasonable allowances were not calculated for Evaluated Barrier 19.

Table 2.2.7-21. Evaluated Barrier 19 Alternatives 1C, 2, 3, and 5

Barrier I.D.: Evaluated Barrier 19 Alternatives 1C, 2, 3, and 5														
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
R129	2	74	74	0	73	1	72	2	71	3	70	4	70	4

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Between Treat Boulevard and Parkside Drive (Evaluated Barrier 2)

Outdoor areas of the residences east of Jones Road were identified for noise abatement because modeled Design Year (2047) Build condition noise levels would approach or exceed the NAC under all Build Alternatives. Different soundwalls were evaluated for each Build Alternative due to the proposed braided ramps at this location under Alternatives 2, 3, and 5.

Receptors ST-41, ST-44, R458, R459, and R479 were identified for noise abatement because modeled Design Year (2047) Build condition noise levels would approach or exceed the NAC under Alternative 1C. Evaluated Barrier 2 (NMT-RW4 and MNT-RW5) was modeled along I-680 northbound ROW, extending approximately 1,730 feet under Alternative 1C.

Table 2.2.7-22 shows the Design Year (2047) Build condition noise levels and insertion loss for Evaluated Barrier 2 (NMT-RW4 and MNT-RW5) at various design heights under Alternative 1C. Evaluated Barrier 2 (NMT-RW4 and MNT-RW5) would feasibly abate traffic noise at a minimum height of 12 feet but would not meet the 7 dB design goal, even at a height of 16 feet.

Table 2.2.7-22. Evaluated Barrier 2 (NMT-RW4 and MNT-RW5) Alternative 1C

Barrier I.D.: Evaluated Barrier 2 (NMT-RW4 and MNT-RW5) Alternative 1C														
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-41	2	68	65	3	64	4	64	4	63	5	63	5	63	5
ST-42	2	56	54	2	53	3	52	4	51	5	51	5	51	5
ST-43	3	54	53	1	52	2	52	2	51	3	51	3	51	3
ST-44	1	69	69	0	69	0	69	0	68	1	68	1	67	2
R131	2	62	62	0	61	1	61	1	61	1	61	1	61	1
R132	1	64	61	3	60	4	60	4	59	5	58	6	58	6
R133	4	53	51	2	51	2	50	3	50	3	50	3	49	4
R134	2	59	56	3	56	3	55	4	55	4	55	4	54	5
R454	1	64	62	2	62	2	61	3	61	3	61	3	61	3
R455	1	58	56	2	55	3	54	4	54	4	54	4	53	5

Barrier I.D.: Evaluated Barrier 2 (NMT-RW4 and MNT-RW5) Alternative 1C														
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
R456	2	65	63	2	62	3	61	4	60	5	60	5	60	5
R457	2	57	55	2	55	2	54	3	53	4	53	4	53	4
R458	2	66	64	2	63	3	63	3	62	4	62	4	62	4
R459	4	71	69	2	68	3	67	4	66	5	66	5	66	5
R460	1	64	62	2	61	3	60	4	59	5	59	5	59	5
R476	4	65	65	1	65	1	65	1	65	1	65	1	65	1
R477	4	64	64	1	64	1	63	2	63	2	63	2	63	2
R478	8	64	63	2	63	2	63	2	62	3	62	3	62	3
R479	12	67	66	2	65	3	65	3	65	3	65	3	65	3
R480	2	63	61	2	60	3	59	4	58	5	57	6	57	6

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Outdoor areas of the residences east of Jones Road, represented by Receptors ST-41, ST-44, R458, R459, and R479 have been identified for noise abatement because modeled Design Year (2047) Build condition noise levels would approach or exceed the NAC under Alternative 2. Evaluated Barrier 2 was modeled along the proposed Treat Boulevard braided ramp, extending approximately 2,300 feet. As indicated in Table 2.2.7-23, Evaluated Barrier 2 would not feasibly abate traffic noise or meet the 7 dB noise reduction goal at impacted receptors, even at a height of 16 feet.

Table 2.2.7-23. Evaluated Barrier 2 Alternative 2

Barrier I.D.: Evaluated Barrier 2 (NMT-RW4 and MNT-RW5) Alternative 2														
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-41	2	69	68	1	67	2	66	3	66	3	66	3	65	4
ST-42	2	57	54	3	53	4	53	4	52	5	52	5	51	6
ST-43	3	54	52	2	52	2	51	3	50	4	50	4	50	4
ST-44	1	69	69	0	69	0	69	0	69	0	69	0	68	1
R131	2	62	61	1	60	2	60	2	60	2	60	2	60	2
R132	1	65	62	3	61	4	61	4	60	5	59	6	59	6
R133	1	53	51	2	50	3	50	3	50	3	49	4	49	4
R134	4	58	55	3	54	4	54	4	54	4	53	5	53	5
R451	2	65	65	0	65	0	65	0	64	1	64	1	64	1
R452	1	64	64	0	63	1	63	1	63	1	63	1	63	1
R453	1	65	64	1	64	1	64	1	64	1	64	1	64	1
R454	2	64	61	3	60	4	60	4	60	4	60	4	59	5
R455	2	59	56	3	55	4	55	4	54	5	54	5	54	5
R456	2	65	64	1	63	2	63	2	62	3	62	3	62	3
R457	4	57	56	1	56	1	55	2	55	2	54	3	54	3
R458	1	66	65	1	64	2	64	2	63	3	63	3	62	4
R459	2	69	68	1	67	2	67	2	67	2	67	2	67	2
R460	2	65	63	2	62	3	62	3	61	4	60	5	59	6
R476	4	65	64	1	64	1	64	1	63	2	63	2	63	2
R477	4	64	61	3	61	3	60	4	60	4	59	5	59	5
R478	8	64	62	2	61	3	60	4	60	4	60	4	59	5
R479	12	67	66	1	66	1	65	2	65	2	65	2	65	2
R480	2	63	61	2	60	3	60	3	59	4	58	5	58	5

Barrier I.D.: Evaluated Barrier 2 (NMT-RW4 and MNT-RW5) Alternative 2														
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Outdoor areas of the residences east of Jones Road, represented by Receptors ST-41 through ST-44, R131 through R134, R451 through R460, and R476 through R480, were identified for noise abatement because modeled Design Year (2047) Build condition noise levels under Alternative 3 would approach or exceed the NAC at Receptors ST-41, ST-44, R458, R459, and R479. Evaluated Barrier 2 was modeled along the proposed Treat Boulevard braided ramp, extending approximately 2,300 feet. As indicated in Table 2.2.7-24, Evaluated Barrier 2 would not feasibly abate traffic noise or meet the 7 dB noise reduction goal at impacted receptors, even at a height of 16 feet.

Table 2.2.7-24. Evaluated Barrier 2 Alternative 3

Barrier I.D.: Evaluated Barrier 2 (NMT-RW4 and MNT-RW5) Alternative 3														
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-41	2	69	68	1	67	2	66	3	66	3	66	3	65	4
ST-42	2	57	54	3	53	4	53	4	52	5	52	5	51	6
ST-43	3	54	52	2	52	2	51	3	50	4	50	4	50	4
ST-44	1	69	69	0	69	0	69	0	69	0	69	0	68	1
R131	2	62	61	1	60	2	60	2	60	2	60	2	60	2
R132	1	65	62	3	61	4	61	4	60	5	59	6	59	6
R133	1	53	51	2	50	3	50	3	50	3	49	4	49	4
R134	4	58	55	3	54	4	54	4	54	4	53	5	53	5
R451	2	65	65	0	65	0	65	0	64	1	64	1	64	1

Barrier I.D.: Evaluated Barrier 2 (NMT-RW4 and MNT-RW5) Alternative 3													
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
R452	1	64	64	0	63	1	63	1	63	1	63	1	63	1
R453	1	65	64	1	64	1	64	1	64	1	64	1	64	1
R454	2	64	61	3	60	4	60	4	60	4	60	4	59	5
R455	2	59	56	3	55	4	55	4	54	5	54	5	54	5
R456	2	65	64	1	63	2	63	2	62	3	62	3	62	3
R457	4	57	56	1	56	1	55	2	55	2	54	3	54	3
R458	1	66	65	1	64	2	64	2	63	3	63	3	62	4
R459	2	69	68	1	67	2	67	2	67	2	67	2	67	2
R460	2	65	63	2	62	3	62	3	61	4	60	5	59	6
R476	4	65	64	1	64	1	64	1	63	2	63	2	63	2
R477	4	64	61	3	61	3	60	4	60	4	59	5	59	5
R478	8	64	62	2	61	3	60	4	60	4	60	4	59	5
R479	12	67	66	1	66	1	65	2	65	2	65	2	65	2
R480	2	63	61	2	60	3	60	3	59	4	58	5	58	5

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Outdoor areas of the residences east of Jones Road, represented by Receptors ST-41 through ST-44, R131 through R134, R451 through R460, and R476 through R480 have been identified for noise abatement because modeled Design Year (2047) Build condition noise levels would approach or exceed the NAC at Receptors ST-41, ST-44, R458, R459, and R480 under Alternative 5. Evaluated Barrier 2 was modeled along the proposed Treat Boulevard braided ramp, extending approximately 2,300 feet. As indicated in Table 2.2.7-25, Evaluated Barrier 2 would not feasibly abate traffic noise or meet the 7 dB noise reduction goal at impacted receptors, even at a height of 16 feet.

Table 2.2.7-25. Evaluated Barrier 2 Alternative 5

Barrier I.D.: Evaluated Barrier 2 (NMT-RW4 and MNT-RW5) Alternative 5														
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-41	2	68	67	1	66	2	65	3	65	3	65	3	64	4
ST-42	2	56	53	3	52	4	52	4	51	5	51	5	50	6
ST-43	3	53	51	2	51	2	50	3	49	4	49	4	49	4
ST-44	1	68	68	0	68	0	68	0	68	0	68	0	67	1
R131	2	62	61	1	60	2	60	2	60	2	60	2	60	2
R132	1	64	61	3	60	4	60	4	59	5	58	6	58	6
R133	1	53	51	2	50	3	50	3	50	3	49	4	49	4
R134	4	58	55	3	54	4	54	4	54	4	53	5	53	5
R451	2	65	65	0	65	0	65	0	64	1	64	1	64	1
R452	1	64	64	0	63	1	63	1	63	1	63	1	63	1
R453	1	65	64	1	64	1	64	1	64	1	64	1	64	1
R454	2	63	60	3	59	4	59	4	59	4	59	4	58	5
R455	2	58	56	2	55	3	55	3	54	4	54	4	54	4
R456	2	64	63	1	62	2	62	2	61	3	61	3	61	3
R457	4	56	55	1	55	1	54	2	54	2	53	3	53	3
R458	1	66	65	1	64	2	64	2	63	3	63	3	62	4
R459	2	68	67	1	66	2	66	2	66	2	66	2	66	2
R460	2	64	62	2	61	3	61	3	60	4	59	5	58	6
R476	4	65	64	1	64	1	64	1	63	2	63	2	63	2
R477	4	64	61	3	61	3	60	4	60	4	59	5	59	5
R478	8	64	62	2	61	3	60	4	60	4	60	4	59	5
R479	12	67	66	1	66	1	65	2	65	2	65	2	65	2
R480	2	63	61	2	60	3	60	3	59	4	58	5	58	5

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

As part of the I-680 Southbound HOV Gap Closure Project (SCH# 2013102020), Evaluated Barrier 2 (NMT-RW4 and MNT-RW5), which was referred to as S826 in that project, was studied and found to be feasible and reasonable. Caltrans and the Contra Costa Transportation Authority (CCTA) agreed that this barrier's construction would be postponed until this Project, provided that a majority of the benefitted receptors are in favor of construction. Although Evaluated Barrier 2 was found to not meet the minimum design goal, it was carried forward into the Draft NADR due to the prior commitment and is further described below in the *Preliminary Noise Abatement Decision* section.

The potential for Evaluated Barrier 2 to reflect BART train noise was evaluated along both sides of the BART tracks (Illingworth & Rodkin, 2020). Barrier 2, Option 1 was evaluated along the I-680 edge of pavement between the highway and BART. Barrier 2, Option 2 was evaluated along Jones Road, east of both I-680 and BART. I-680 is elevated above BART by 5 to 10 feet throughout most of this segment and above the residences on Jones Road by approximately 20 feet. The results of this analysis showed that Option 1 would be more effective at reducing I-680 traffic noise at the Jones Road residences than Option 2. Option 2 would reflect BART noise back toward I-680 and not toward Jones Road. Although Option 1 would reflect BART noise toward Jones Road receptors, the "worst-case" noise increases would be less than 1 dBA L_{eq}, which is not considered perceptible.

South of N. Main Street Overpass (Existing Barrier F.1, F.2, and F.3)

Outdoor areas of the residences west of I-680 between San Luis Road and Mt. Diablo Boulevard were identified for noise abatement because modeled Design Year (2047) Build condition noise levels would approach or exceed the NAC. Receptors ST-50, ST-53, R144, R145, R165, R168, and R169 were identified for noise abatement because modeled Design Year (2047) Build condition noise levels would approach or exceed the NAC under Alternative 1C. Receptors ST-50, R144, R145, R165, R168, and R169 were identified for noise abatement because modeled Design Year (2047) Build condition noise levels would approach or exceed the NAC under Alternative 2. Receptors ST-50, ST-53, R144, R145, R165, R167, R168, and R169 were identified for noise abatement because modeled Design Year (2047) Build condition noise levels would approach or exceed the NAC under Alternative 3. Receptors ST-46, ST-48 through ST-50, ST-52, ST-53, and R135 through R169 were identified for noise abatement because modeled Design Year (2047) Build condition noise levels would approach or exceed the NAC at Receptors ST-50, ST-53, R144, R165, R168, and R169 under Alternative 5. Receptors in the area are shielded from I-680 by an existing 14-foot-high noise barrier (Existing Barriers F.1, F.2, and F.3) located along the I-680 southbound travel lanes.

As summarized in Table 2.2.7-26 through Table 2.2.7-29, existing Barriers F.1, F.2, and F.3 meet the noise reduction standard for feasibility and the noise reduction design goal under all Build Alternatives. Existing Barriers F.1, F.2, and F.3 would feasibly abate

traffic noise and meet the 7 dB design goal as currently constructed. Based on these results, these barriers are not studied further in this assessment.

Table 2.2.7-26. Existing Barriers F.1, F.2, and F.3 Alternative 1C

Barrier I.D.: Existing Barriers F.1, F.2, and F.3 Alternative 1C				
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Existing Wall H=14 feet	
			$L_{eq[h]}$	I.L.[1]
ST-46	1	78	64	14
ST-48	1	67	65	2
ST-49	1	67	63	4
ST-50	1	77	68	9
ST-52	1	68	61	7
ST-53	1	77	76	1
R135	7	74	60	14
R136	10	57	55	2
R137	1	64	57	7
R138	10	51	50	1
R139	4	73	63	10
R140	1	58	56	2
R141	8	76	65	11
R144	1	79	69	10
R145	1	75	66	9
R146	5	57	54	3
R147	4	65	62	3
R148	1	64	60	4
R149	3	66	63	3
R150	5	66	63	3

Barrier I.D.: Existing Barriers F.1, F.2, and F.3 Alternative 1C				
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Existing Wall H=14 feet	
			$L_{eq[h]}$	I.L.[1]
R151	4	67	65	2
R152	5	68	65	3
R155	6	63	62	1
R156	6	68	65	3
R157	7	62	62	0
R158	7	62	62	0
R159	5	61	59	2
R160	6	72	60	12
R164	6	59	56	3
R165	8	70	67	3
R166	5	61	58	3
R167	5	66	65	1
R168	8	71	71	0
R169	1	71	69	2

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Table 2.2.7-27. Existing Barriers F.1, F.2, and F.3 Alternative 2

Barrier I.D.: Existing Barriers F.1, F.2, and F.3 Alternative 2				
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Existing Wall H=14 feet	
			$L_{eq[h]}$	I.L.[1]
ST-46	1	77	63	14
ST-48	1	67	64	3
ST-49	1	67	63	4
ST-50	1	77	68	9
ST-52	1	68	61	7
ST-53	1	77	76	1
R135	7	73	59	14
R136	10	57	55	2
R137	1	63	56	7
R138	10	51	50	1
R139	4	73	63	10
R140	1	58	56	2
R141	8	76	65	11
R144	1	79	69	10
R145	1	75	66	9
R146	5	57	53	4
R147	4	65	61	4
R148	1	64	60	4
R149	3	64	62	2
R150	5	65	62	3
R151	4	66	64	2
R152	5	68	65	3
R155	6	63	62	1
R156	6	68	65	3
R157	7	62	62	0

Barrier I.D.: Existing Barriers F.1, F.2, and F.3 Alternative 2				
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Existing Wall H=14 feet	
			$L_{eq[h]}$	I.L.[1]
R158	7	62	62	0
R159	5	61	59	2
R160	6	72	61	11
R164	6	59	56	3
R165	8	70	67	3
R166	5	61	58	3
R167	5	66	65	1
R168	8	71	71	0
R169	1	71	71	0

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Table 2.2.7-28. Existing Barriers F.1, F.2, and F.3 Alternative 3

Barrier I.D.: Existing Barriers F.1, F.2, and F.3 Alternative 3				
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Existing Wall H=14 feet	
			$L_{eq[h]}$	I.L.[1]
ST-46	1	78	63	15
ST-48	1	67	65	2
ST-49	1	67	63	4

Barrier I.D.: Existing Barriers F.1, F.2, and F.3 Alternative 3				
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Existing Wall H=14 feet	
			$L_{eq[h]}$	I.L.[1]
ST-50	1	77	68	9
ST-52	1	68	62	6
ST-53	1	77	76	1
R135	7	73	59	14
R136	10	57	55	2
R137	1	63	56	7
R138	10	51	50	1
R139	4	73	63	10
R140	1	58	56	2
R141	8	76	65	11
R144	1	79	69	10
R145	1	75	66	9
R146	5	57	53	4
R147	4	65	62	3
R148	1	64	60	4
R149	3	66	63	3
R150	5	66	63	3
R151	4	67	64	3
R152	5	68	65	3
R155	6	63	62	1
R156	6	68	65	3
R157	7	62	62	0
R158	7	62	62	0
R159	5	61	59	2
R160	6	72	60	12
R164	6	59	57	2

Barrier I.D.: Existing Barriers F.1, F.2, and F.3 Alternative 3				
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Existing Wall H=14 feet	
			$L_{eq[h]}$	I.L.[1]
R165	8	70	69	1
R166	5	61	59	2
R167	5	66	66	0
R168	8	71	71	0
R169	1	71	70	1

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Table 2.2.7-29. Existing Barriers F.1, F.2, and F.3 Alternative 5

Barrier I.D.: Existing Barriers F.1, F.2, and F.3 Alternative 5				
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Existing Wall H=14 feet	
			$L_{eq[h]}$	I.L.[1]
ST-46	1	77	63	14
ST-48	1	66	64	2
ST-49	1	67	63	4
ST-50	1	77	67	10
ST-52	1	67	60	7

Barrier I.D.: Existing Barriers F.1, F.2, and F.3 Alternative 5				
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Existing Wall H=14 feet	
			$L_{eq[h]}$	I.L.[1]
ST-53	1	77	76	1
R135	7	73	59	14
R136	10	57	55	2
R137	1	63	56	7
R138	10	51	50	1
R139	4	73	64	9
R140	1	58	56	2
R141	8	76	65	11
R144	1	79	69	10
R145	1	75	65	10
R146	5	57	53	4
R147	4	65	61	4
R148	1	63	59	4
R149	3	66	62	4
R150	5	66	62	4
R151	4	67	63	4
R152	5	68	64	4
R155	6	63	60	3
R156	6	68	64	4
R157	7	62	61	1
R158	7	62	61	1
R159	5	61	59	2
R160	6	72	61	11

Barrier I.D.: Existing Barriers F.1, F.2, and F.3 Alternative 5				
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Existing Wall H=14 feet	
			$L_{eq[h]}$	I.L.[1]
R164	6	59	56	3
R165	8	70	67	3
R166	5	61	58	3
R167	5	66	65	1
R168	8	71	71	0
R169	1	71	71	0

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

South of Parkside Drive (Evaluated Barrier 3)

Outdoor areas of the residences east of I-680, represented by Receptor R154, were identified for noise abatement because modeled Design Year (2047) Build condition noise levels would approach or exceed the NAC under Alternatives 1C, 2, and 5. Evaluated Barrier 3 was modeled along the I-680 northbound travel lanes, extending approximately 530 feet.

Table 2.2.7-30 shows the Design Year (2047) Alternative 1C, 2, and 5 Build condition noise levels and insertion loss for Evaluated Barrier 3 at various design heights. Evaluated Barrier 3 would not feasibly abate traffic noise or meet the 7 dB noise reduction goal at impacted receptor R154, even at a height of 16 feet. Therefore, reasonable allowances were not calculated for Evaluated Barrier 3.

Table 2.2.7-30. Evaluated Barrier 3 Alternatives 1C, 2, and 5

Barrier I.D.: Evaluated Barrier 3 Alternatives 1C, 2, and 5														
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
R154	3	66	66	0	66	0	66	0	66	0	65	1	65	1

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

South of Oakvale Road Overpass (Evaluated Barrier 4)

Outdoor areas of the residences east of I-680, represented by Receptors ST-54, R171, and R174, were identified for noise abatement because modeled Design Year (2047) Build condition noise levels would approach or exceed the NAC under all Build Alternatives. Evaluated Barrier 4 was modeled along the I-680 northbound travel lanes, extending approximately 410 feet.

Table 2.2.7-31 through Table 2.2.7-34 show the Design Year (2047) Build condition noise levels and insertion loss for Evaluated Barrier 4 at various design heights for each Build Alternative. Evaluated Barrier 4 would feasibly abate traffic noise at a minimum height of 12 feet but would not meet the 7 dB design goal, even at a height of 16 feet. Therefore, reasonable allowances were not calculated for Evaluated Barrier 4.

Table 2.2.7-31. Evaluated Barrier 4 Alternative 1C

Barrier I.D.: Evaluated Barrier 4 Alternative 1C														
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-54	2	68	65	3	64	4	63	5	63	5	63	5	62	6
R170	1	65	64	1	64	1	64	1	64	1	64	1	64	1
R171	1	66	64	2	64	1	64	1	64	1	64	1	64	1

Barrier I.D.: Evaluated Barrier 4 Alternative 1C													
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
R172	4	62	62	0	62	0	62	0	62	0	62	0	62	0
R174	1	73	71	2	71	2	70	3	69	4	68	5	68	5
R176	1	62	61	1	61	1	61	1	61	1	61	1	61	1
R177	4	56	56	0	56	0	56	0	55	1	55	1	55	1
R178	4	58	58	0	58	0	58	0	58	0	58	0	57	1

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Table 2.2.7-32. Evaluated Barrier 4 Alternative 2

Barrier I.D.: Evaluated Barrier 4 Alternative 2													
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-54	2	66	63	3	62	4	62	4	61	5	61	5	61	5
R170	1	64	63	1	63	1	63	1	63	1	63	1	63	1
R171	1	66	64	2	64	1	64	1	64	1	64	1	64	1
R172	4	62	62	0	62	0	62	0	62	0	62	0	62	0
R174	1	73	71	2	71	2	70	3	69	4	68	5	68	5
R176	1	60	60	0	60	0	60	0	60	0	60	0	60	0
R177	4	55	55	0	55	0	55	0	55	0	55	0	55	0

Barrier I.D.: Evaluated Barrier 4 Alternative 2														
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
R178	4	58	58	0	58	0	58	0	58	0	58	0	58	0

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Table 2.2.7-33. Evaluated Barrier 4 Alternative 3

Barrier I.D.: Evaluated Barrier 4 Alternative 3														
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-54	2	68	65	3	64	4	64	4	63	5	63	5	62	6
R170	1	65	64	1	64	1	64	1	64	1	64	1	64	1
R171	1	66	64	2	64	1	64	1	64	1	64	1	64	1
R172	4	62	62	0	62	0	62	0	62	0	62	0	62	0
R174	1	74	72	2	72	2	71	3	70	4	69	5	69	5
R176	1	62	62	0	62	0	62	0	62	0	62	0	62	0
R177	4	57	57	0	57	0	57	0	57	0	57	0	57	0
R178	4	58	58	0	58	0	58	0	58	0	58	0	58	0

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Table 2.2.7-34. Evaluated Barrier 4 Alternative 5

Barrier I.D.: Evaluated Barrier 4 Alternative 5													
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-54	2	66	63	3	62	4	62	4	61	5	61	5	61	5
R170	1	64	63	1	63	1	63	1	63	1	63	1	63	1
R171	1	66	64	2	64	1	64	1	64	1	64	1	64	1
R172	4	62	62	0	62	0	62	0	62	0	62	0	62	0
R174	1	73	71	2	71	2	70	3	69	4	68	5	68	5
R176	1	60	60	0	60	0	60	0	60	0	60	0	60	0
R177	4	55	55	0	55	0	55	0	55	0	55	0	55	0
R178	4	57	57	0	57	0	57	0	57	0	57	0	57	0

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

At State Route 24

The outdoor areas of the residences south of the I-680/SR-24 Interchange, along the eastbound SR-24 On-ramp to southbound I-680, represented by Receptors ST-57, R183, R184, R186, R461, R463, R464, and R465, were identified for noise abatement because modeled Design Year (2047) Build condition noise levels would approach or exceed the NAC under Alternatives 1C and 3. Receptors in this area are shielded from I-680 by an existing, 10-foot-high noise barrier (Existing Barrier G.1) located along the SR-24 eastbound ramp onto southbound I-680 and two 12-foot-high noise barriers (Existing Barriers G.2 and G.3) located along the I-680 southbound Olympic Boulevard Off-ramp.

As part of Alternatives 1C and 3, a portion of Barrier G.1 would be removed and replaced with Barrier 24-RW2, and Barrier G.2 would be removed and replaced by Barrier 24-RW4. Two additional barriers were modeled (Barrier SW No. 1 and Evaluated Barrier 5). Barrier 5 was modeled along the proposed, realigned I-680 southbound travel lanes, extending approximately 910 feet. Barrier 24-RW2 was modeled along the proposed realigned eastbound SR-24 ramp onto southbound I-680, extending approximately 860 feet. Barrier SW No. 1 was modeled along the realigned southbound I-680 lanes, extending approximately 740 feet. Barrier 24-RW4 was

modeled along the realigned southbound I-680 off-ramp to Olympic Boulevard, extending approximately 500 feet.

Table 2.2.7-35 and Table 2.2.7-36 show the Design Year (2047) Build condition noise levels and insertion loss for Barriers 5, SW No. 1, 24-RW2, and 24-RW4 at various design heights under Alternatives 1C and 3, respectively. Barriers 5, 24-RW2, SW No.1, and 24-RW4 would feasibly abate traffic noise at a minimum height of 8 feet but would not meet the 7 dB design goal. Barriers 5, 24-RW2, SW No.1, and 24-RW4 would feasibly abate traffic noise at a minimum height of 12 feet and meet the 7 dB noise reduction goal at a height of 16 feet. Therefore, these barriers were carried forward into the Draft NADR under Alternatives 1C and 3 and are further described below in the *Preliminary Noise Abatement Decision* section. The reasonable allowance calculated for a barrier height of 16 feet is $535,000.

Table 2.2.7-35. Barriers 5, 24-RW2, SW No.1, and 24-RW4 Alternative 1C

Barrier I.D.: Barriers 5, 24-RW2, SW No.1, and 24-RW4 Alternative 1C													
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-57	2	66	65	1	65	1	65	1	65	1	64	2	64	2
R183	2	73	71	2	70	3	69	4	68	5	68	5	67	6
R184	4	68	68	0	68	0	68	0	67	1	66	2	66	2
R185	3	64	64	0	64	0	64	0	64	0	63	1	63	1
R186	2	67	67	0	67	0	66	1	66	1	65	2	65	2
R461	3	70	69	1	69	1	68	2	67	3	65	5	63	7
R462	2	64	64	0	64	0	63	1	63	1	62	2	61	3
R463	2	69	69	0	68	1	68	1	67	2	66	3	65	4
R464	5	68	67	1	67	1	67	1	66	2	65	3	64	4
R465	2	71	71	0	70	1	70	1	70	1	69	2	69	2

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Table 2.2.7-36. Barriers 5, 24-RW2, SW No.1, and 24-RW4 Alternative 3

Barrier I.D.: Barriers 5, 24-RW2, SW No.1, and 24-RW4 Alternative 3													
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-57	2	66	65	1	65	1	65	1	65	1	64	2	64	2
R183	2	71	69	2	68	3	67	4	66	5	66	5	65	6
R184	4	69	69	0	69	0	69	0	68	1	67	2	67	2
R185	3	65	65	0	65	0	65	0	65	0	64	1	64	1
R186	2	68	67	1	67	1	66	2	66	2	65	3	65	3
R461	3	71	70	1	70	1	69	2	68	3	66	5	64	7
R462	2	65	65	0	65	0	64	1	64	1	63	2	62	3
R463	2	69	69	0	68	1	68	1	67	2	66	3	65	4
R464	5	68	67	1	67	1	67	1	66	2	65	3	64	4
R465	2	71	71	0	70	1	70	1	70	1	69	2	69	2

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Unlike Alternatives 1C and 3, Alternatives 2 and 5 would not realign the I-680/SR-24 Interchange. Receptors R184, R461, R463, R464, and R465 were identified for noise abatement because modeled Design Year (2047) Build condition noise levels would approach or exceed the NAC under Alternative 2. Receptors R184, R461, R463, and R464, were identified for noise abatement because modeled Design Year (2047) Build condition noise levels would approach or exceed the NAC under Alternative 5.

As summarized in Table 2.2.7-37 and Table 2.2.7-38, existing Barriers G.1, G.2, and G.3 were calculated to provide 7 dB of noise reduction at R183 under Alternatives 2 and 5. Existing Barriers G.1, G.2, and G.3 meet the noise reduction standard for feasibility and the noise reduction design goal. Based on these results, these barriers are not studied further in this assessment under Alternatives 2 or 5.

Table 2.2.7-37. Existing Barriers G.1, G.2, and G.3 Alternative 2

Barrier I.D.: Existing Barriers G.1, G.2, and G.3 Alternative 2				
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Existing Wall H=10 to 12 feet	
			$L_{eq[h]}$	I.L.[1]
ST-57	2	66	63	3
R183	2	72	65	7
R184	4	68	67	1
R185	3	64	62	2
R186	2	69	65	4
R461	3	69	67	2
R462	2	63	61	2
R463	2	70	68	2
R464	5	68	68	0
R465	2	68	66	2

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Table 2.2.7-38. Existing Barriers G.1, G.2, and G.3 Alternative 5

Barrier I.D.: Existing Barriers G.1, G.2, and G.3 Alternative 5				
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Existing Wall H=10 to 12 feet	
			$L_{eq[h]}$	I.L.[1]
ST-57	2	66	63	3
R183	2	72	65	7

Barrier I.D.: Existing Barriers G.1, G.2, and G.3 Alternative 5				
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Existing Wall H=10 to 12 feet	
			$L_{eq[h]}$	I.L.[1]
R184	4	68	67	1
R185	3	64	62	2
R186	2	69	65	4
R461	3	69	67	2
R462	2	63	61	2
R463	2	70	68	2
R464	5	68	68	0
R465	2	68	65	3

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

South of Olympic Boulevard (Evaluated Barrier 6)

Outdoor areas of the residences south of Olympic Boulevard east of I-680, represented by Receptors R197, R198, and R200, were identified for noise abatement because modeled Design Year (2047) Build condition noise levels would approach or exceed the NAC under all Build Alternatives. Evaluated Barrier 6 was modeled along the I-680 northbound SR-24 westbound ramp, extending approximately 1,300 feet.

Table 2.2.7-39 through Table 2.2.7-42 show the Design Year 2047 Build condition noise levels and insertion loss for Evaluated Barrier 6 at various design heights for each Build Alternative. Evaluated Barrier 6 would feasibly abate traffic noise at a minimum height of 6 feet and would meet the 7 dB noise reduction goal at a minimum height of 10 feet. As such, it is further described below in the *Preliminary Noise Abatement Decision* section. The reasonable allowance calculated for a barrier height of 10 feet is $1,712,000 and for a barrier height of 12 feet or greater is $2,140,000.

Table 2.2.7-39. Evaluated Barrier 6 Alternative 1C

Barrier I.D.: Evaluated Barrier 6 Alternative 1C													
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-56	4	65	63	2	62	3	61	4	60	5	60	5	59	6
R196	1	54	54	0	54	0	53	1	53	1	52	2	52	2
R197	3	72	68	4	67	5	65	7	65	7	64	8	63	9
R198	3	74	68	5	67	6	65	8	64	9	64	9	63	10
R199	1	55	55	0	54	1	54	1	54	1	53	2	53	2
R200	10	72	68	3	66	5	66	5	65	6	65	6	64	7

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Table 2.2.7-40. Evaluated Barrier 6 Alternative 2

Barrier I.D.: Evaluated Barrier 6 Alternative 2													
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-56	4	65	63	2	62	3	61	4	60	5	60	5	59	6
R196	1	54	54	0	54	0	53	1	53	1	52	2	52	2
R197	3	72	68	4	67	5	65	7	65	7	64	8	63	9
R198	3	74	68	6	67	7	65	9	64	10	64	10	63	11
R199	1	55	55	0	54	1	54	1	54	1	53	2	53	2
R200	10	72	68	4	66	6	66	6	65	7	65	7	64	8

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Table 2.2.7-41. Evaluated Barrier 6 Alternative 3

Barrier I.D.: Evaluated Barrier 6 Alternative 3														
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-56	4	64	62	2	61	3	60	4	59	5	59	5	58	6
R196	1	53	53	0	53	0	52	1	52	1	51	2	51	2
R197	3	71	67	4	66	5	64	7	64	7	63	8	62	9
R198	3	74	69	5	68	6	66	8	65	9	65	9	64	10
R199	1	55	55	0	54	1	54	1	54	1	53	2	53	2
R200	10	71	68	3	66	5	66	5	65	6	65	6	64	7

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Table 2.2.7-42. Evaluated Barrier 6 Alternative 5

Barrier I.D.: Evaluated Barrier 6 Alternative 5														
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-56	4	63	61	2	60	3	59	4	58	5	58	5	57	6
R196	1	53	53	0	53	0	52	1	52	1	51	2	51	2
R197	3	70	66	4	65	5	63	7	63	7	62	8	61	9
R198	3	73	68	5	67	6	65	8	64	9	64	9	63	10
R199	1	55	55	0	54	1	54	1	54	1	53	2	53	2
R200	10	71	68	3	66	5	66	5	65	6	65	6	64	7

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Between Olympic Boulevard and I-680 Southbound S. Main Street Off-ramp (Existing Barrier H):

Outdoor areas of the residences south of I-680 between Olympic Boulevard and the S. Main Street Off-ramp were identified for noise abatement. Receptors R187 and R188 were identified for noise abatement because modeled Design Year (2047) Build condition noise levels would approach or exceed the NAC under Alternative 1C. Receptors ST-58 through ST-59, R187 through R195, and R202 through R209 have been identified for noise abatement because modeled Design Year (2047) Build condition noise levels would approach or exceed the NAC at Receptor R187 under Alternative 2. Receptors ST-58, ST-59, and R187 through R209, have been identified for noise abatement because modeled Design Year (2047) Build condition noise levels would approach or exceed the NAC at R187 under Alternative 3. Receptors ST-58, ST-59, R187 through R195, and R202 through R209, have been identified for noise abatement because modeled Design Year (2047) Build condition noise levels would approach or exceed the NAC at Receptor R187 under Alternative 5. Receptors R187 and R188 are shielded from I-680 by an existing, 12-foot-high noise barrier (Existing Barrier H) located along the I-680 southbound travel lanes.

As summarized in Table 2.2.7-43 through Table 2.2.7-46, Existing Barrier H would feasibly abate traffic noise and meet the 7 dB design goal at its existing height of 12 feet. Based on these results, this barrier is not studied further in this assessment.

Table 2.2.7-43. Existing Barrier H Alternative 1C

Barrier I.D.: Existing Barrier H Alternative 1C				
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Existing Wall H=12 feet	
			$L_{eq[h]}$	I.L.[1]
ST-58	1	63	62	1
ST-59	1	69	59	10
R187	3	72	72	0
R188	4	67	66	1
R189	6	64	63	1
R190	4	60	59	1
R191	3	67	59	8
R192	1	71	60	11
R193	4	67	62	5
R194	4	69	62	7
R195	3	71	61	10
R202	1	71	64	7
R203	4	67	64	3
R204	6	67	64	3
R205	5	69	60	9
R206	1	70	64	6
R207	5	67	62	5
R208	4	65	61	4
R209	6	66	62	4

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Table 2.2.7-44. Existing Barrier H Alternative 2

Barrier I.D.: Existing Barrier H Alternative 2				
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Existing Wall H=12 feet	
			$L_{eq[h]}$	I.L.[1]
ST-58	1	62	61	1
ST-59	1	69	59	10
R187	3	72	71	1
R188	4	66	64	2
R189	6	64	62	2
R190	4	59	58	1
R191	3	68	59	9
R192	1	72	60	12
R193	4	68	61	7
R194	4	69	61	8
R195	3	71	61	10
R202	1	70	63	7
R203	4	68	62	6
R204	6	68	63	5
R205	5	69	61	8
R206	1	70	63	7
R207	5	67	62	5
R208	4	65	61	4
R209	6	65	60	5

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Table 2.2.7-45. Existing Barrier H Alternative 3

Barrier I.D.: Existing Barrier H Alternative 3				
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Existing Wall H=12 feet	
			$L_{eq[h]}$	I.L.[1]
ST-58	1	62	61	1
ST-59	1	69	59	10
R187	3	72	71	1
R188	4	66	64	2
R189	6	64	62	2
R190	4	59	58	1
R191	3	68	59	9
R192	1	72	60	12
R193	4	68	61	7
R194	4	69	61	8
R195	3	71	61	10
R202	1	70	63	7
R203	4	68	62	6
R204	6	68	63	5
R205	5	69	61	8
R206	1	70	63	7
R207	5	67	62	5
R208	4	65	61	4
R209	6	65	60	5

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Table 2.2.7-46. Existing Barrier H Alternative 5

Barrier I.D.: Existing Barrier H Alternative 5				
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Existing Wall H=12 feet	
			$L_{eq[h]}$	I.L.[1]
ST-58	1	62	62	0
ST-59	1	69	59	10
R187	3	73	72	1
R188	4	65	64	1
R189	6	63	62	1
R190	4	59	58	1
R191	3	70	59	11
R192	1	72	60	12
R193	4	67	61	6
R194	4	69	61	8
R195	3	71	61	10
R202	1	70	63	7
R203	4	67	62	5
R204	6	67	63	4
R205	5	68	60	8
R206	1	70	63	7
R207	5	67	62	5
R208	4	65	61	4
R209	6	65	60	5

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Between Lilac Drive and I-680 Southbound S. Main Street Off-ramp (Evaluated Barrier 7)

The outdoor areas of Las Lomas High School were identified for noise abatement because modeled Design Year (2047) Build condition noise levels would approach or exceed the NAC. Receptors R220, R221, and R222 were identified for noise abatement because modeled Design Year (2047) Build condition noise levels would approach or exceed the NAC at Receptor R221 under Alternatives 1C and 3. Receptors ST-62, R221, and R222 were identified for noise abatement because modeled Design Year (2047) Build condition noise levels would approach or exceed the NAC under Alternatives 2 and 5.

Evaluated Barrier 7 was modeled along the I-680 northbound travel lanes, extending approximately 790 feet. Table 2.2.7-47 through Table 2.2.7-50 show the Design Year (2047) Build condition noise levels and insertion loss for Evaluated Barrier 7 at various design heights for each Build Alternative. Evaluated Barrier 7 would feasibly abate traffic noise at a height of 14 feet but would not meet the 7 dB noise reduction goal, even at a height of 16 feet. Therefore, reasonable allowances were not calculated for Evaluated Barrier 7.

Table 2.2.7-47. Evaluated Barrier 7 Alternative 1C

Barrier I.D.: Evaluated Barrier 7 Alternative 1C														
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-62	0	68	67	1	67	1	66	2	66	2	66	2	66	2
R220	1	66	64	2	64	2	64	2	63	3	63	3	62	4
R221	1	68	65	3	65	3	64	4	64	4	63	5	63	5
R222	1	69	67	2	67	2	66	3	66	3	65	4	65	4

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Table 2.2.7-48. Evaluated Barrier 7 Alternative 2

Barrier I.D.: Evaluated Barrier 7 Alternative 2													
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-62	0	67	66	1	66	1	65	2	65	2	65	2	65	2
R220	1	65	63	2	63	2	63	2	62	3	62	3	61	4
R221	1	66	63	3	63	3	62	4	62	4	61	5	61	5
R222	1	68	66	2	66	2	65	3	65	3	64	4	64	4

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Table 2.2.7-49. Evaluated Barrier 7 Alternative 3

Barrier I.D.: Evaluated Barrier 7 Alternative 3													
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-62	0	67	66	1	66	1	65	2	65	2	65	2	65	2
R220	1	66	64	2	64	2	64	2	63	3	63	3	62	4
R221	1	68	65	3	65	3	64	4	64	4	63	5	63	5
R222	1	69	67	2	67	2	66	3	66	3	65	4	65	4

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Table 2.2.7-50. Evaluated Barrier 7 Alternative 5

Barrier I.D.: Evaluated Barrier 7 Alternative 5														
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-62	0	66	65	1	65	1	64	2	64	2	64	2	64	2
R220	1	64	62	2	62	2	62	2	61	3	61	3	60	4
R221	1	66	63	3	63	3	62	4	62	4	61	5	61	5
R222	1	68	66	2	66	2	65	3	65	3	64	4	64	4

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Between I-680 Southbound S. Main Street Off-ramp and North of Rudgear Road (Existing Barrier I)

Outdoor areas of the residences south of I-680 between Olympic Boulevard and the S. Main Street Off-ramp, represented by Receptors ST-60, R211, R215, and R216, were identified for noise abatement because modeled Design Year (2047) Build condition noise levels would approach or exceed the NAC under all Build Alternatives. Receptors in the area are shielded from I-680 by an existing, 12-foot-high noise barrier (Existing Barrier I) located along I-680 southbound travel lanes.

As summarized in Table 2.2.7-51 through Table 2.2.7-53, Existing Barrier I meets the noise reduction standard for feasibility and the noise reduction design goal. Based on these results, this barrier is not studied further in this assessment.

Table 2.2.7-51. Existing Barrier I Alternative 1C and 3

Barrier I.D.: Existing Barrier I Alternatives 1C and 3				
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Existing Wall H=12 feet	
			$L_{eq[h]}$	I.L.[1]
ST-60	1	74	70	4
R209	6	67	62	5
R210	6	67	62	5
R211	4	72	67	5
R212	6	69	63	6
R213	6	71	65	6
R214	7	60	58	2
R215	6	79	71	8
R216	3	77	71	6
R217	5	68	63	5
R218	3	66	65	1

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Table 2.2.7-52. Existing Barrier I Alternative 2

Barrier I.D.: Existing Barrier I Alternative 2				
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Existing Wall H=12 feet	
			$L_{eq[h]}$	I.L.[1]
ST-60	1	74	69	5
R209	6	64	60	4
R210	6	66	61	5
R211	4	71	66	5
R212	6	68	62	6
R213	6	68	63	5
R214	7	60	57	3
R215	6	78	70	8
R216	3	75	70	5
R217	5	67	62	5
R218	3	66	65	1

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Table 2.2.7-53. Existing Barrier I Alternative 5

Barrier I.D.: Existing Barrier I Alternative 5				
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Existing Wall H=12 feet	
			$L_{eq[h]}$	I.L.[1]
ST-60	1	74	69	5
R209	6	64	60	4
R210	6	65	60	5
R211	4	71	66	5
R212	6	67	61	6
R213	6	68	63	5
R214	7	58	56	2
R215	6	78	70	8
R216	3	75	70	5
R217	5	66	61	5
R218	3	65	64	1

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

North of Rudgear Road (Barrier RSM-RW2):

Outdoor areas of the residences north of Rudgear Road, represented by Receptors ST-63, R224, R225, R226, and R227, are shielded from I-680 by an existing, 12-foot-high noise barrier located along I-680 northbound travel lanes. Alternatives 1C, 2, and 3 would remove and replace a portion of the exiting noise barrier with Barrier RSM-RW2.

Table 2.2.7-54 and Table 2.2.7-55 show the Design Year (2047) Build condition noise levels and insertion loss for Barrier RSM-RW2 at various design heights under Alternatives 1C, 2, and 3. Barrier RSM-RW2 would not feasibly abate traffic noise or meet the 7 dB noise reduction goal, even at a height of 16 feet.

Evaluated Barrier RSM-RW2 is an existing barrier and is recommended for construction for Alternatives 1C, 2, and 3, but was not further considered for reasonableness for noise abatement. Therefore, reasonable allowances were not calculated for Barrier RSM-RW2. Barrier RSM-RW2 would consist of an approximately 12-foot-high soundwall on a maximum 10-foot-high retaining wall.

Table 2.2.7-54. Barrier RSM-RW2 Alternative 1C

Barrier I.D.: Barrier RSM-RW2 Alternative 1C														
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-63	49	71	71	0	70	1	70	1	69	2	68	3	67	4
R224	1	65	65	0	65	0	65	0	65	0	64	1	63	2
R225	32	65	65	0	65	0	65	0	64	1	63	2	63	2
R226	1	74	74	0	74	0	74	0	74	0	74	0	74	0
R227	10	57	57	0	57	0	57	0	57	0	57	0	57	0

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Table 2.2.7-55. Barrier RSM-RW2 Alternatives 2 and 3

Barrier I.D.: Barrier RSM-RW2 Alternative 3

Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-63	49	71	71	0	70	1	70	1	69	2	68	3	67	4
R224	1	64	62	2	62	2	62	2	62	2	61	3	60	4
R225	32	65	65	0	65	0	65	0	64	1	63	2	63	2
R226	1	73	73	0	73	0	73	0	73	0	73	0	73	0
R227	10	57	57	0	57	0	57	0	57	0	57	0	57	0

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

At Rudgear Road Along Southbound I-680 (Evaluated Barrier 8)

Iron Horse Regional Trail (ST-61) and nearby residences were identified for noise abatement because modeled Design Year (2047) Build condition noise levels would approach or exceed the NAC. Receptors ST-61 and R230 were identified for noise abatement because modeled Design Year (2047) Build condition noise levels would approach or exceed the NAC under Alternatives 1C and 2. Receptors ST-61, R218, R219, and R230 were identified for noise abatement because modeled Design Year (2047) Build condition noise levels would approach or exceed the NAC at Receptors ST-61 and R230 under Alternatives 3 and 5

Evaluated Barrier 8 was modeled along the I-680 southbound travel lanes, extending approximately 1,085 feet. Table 2.2.7-56 through Table 2.2.7-58 show the Design Year (2047) Build condition noise levels and insertion loss for Evaluated Barrier 8 at various design heights for each Build Alternative. Evaluated Barrier 8 would not feasibly abate traffic noise or meet the 7 dB noise reduction goal at impacted receptor ST-61, even at a height of 16 feet. Therefore, reasonable allowances were not calculated for Evaluated Barrier 8.

Table 2.2.7-56. Evaluated Barrier 8 Alternatives 1C and 3

Barrier I.D.: Evaluated Barrier 8 Alternatives 1C and 3														
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-61	0	67	66	1	66	1	65	2	65	2	64	3	63	4
R218	3	65	64	1	64	1	63	2	63	2	62	3	62	3
R219	2	65	64	1	64	1	63	2	63	2	62	3	61	4
R230	1	67	66	1	66	1	66	1	66	1	66	1	66	1

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Table 2.2.7-57. Evaluated Barrier 8 Alternative 2

Barrier I.D.: Evaluated Barrier 8 Alternative 1C														
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-61	0	67	66	1	66	1	65	2	65	2	64	3	63	4
R218	3	65	64	1	64	1	63	2	63	2	62	3	62	3
R219	2	65	64	1	64	1	63	2	63	2	62	3	61	4
R230	1	67	66	1	66	1	66	1	66	1	66	1	66	1

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Table 2.2.7-58. Evaluated Barrier 8 Alternative 5

Barrier I.D.: Evaluated Barrier 8 Alternative 5														
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-61	0	67	66	1	66	1	65	2	65	2	64	3	63	4
R218	3	64	63	1	63	1	62	2	62	2	61	3	61	3
R219	2	65	64	1	64	1	63	2	63	2	62	3	61	4
R230	1	67	66	1	66	1	66	1	66	1	66	1	66	1

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

At Rudgear Road Along Northbound I-680 (Evaluated Barrier 9)

Outdoor areas of the residences east of S. Broadway, north of Rudgear Road, represented by Receptors R228 and R229, were identified for noise abatement because modeled Design Year (2047) Build condition noise levels would approach or exceed the NAC at Receptor R228 under Alternatives 1C, 2, and 3. Evaluated Barrier 9 was modeled along the I-680 northbound travel lanes, extending approximately 575 feet.

Table 2.2.7-59 shows the Design Year (2047) Build condition noise levels and insertion loss for Evaluated Barrier 9 at various design heights under Alternatives 1C, 2, and 3. Evaluated Barrier 9 would not feasibly abate traffic noise or meet the 7 dB noise reduction goal at impacted Receptors R228 or R229, even at a height of 16 feet. Therefore, reasonable allowances were not calculated for Evaluated Barrier 9.

Table 2.2.7-59. Evaluated Barrier 9 Alternatives 1C, 2, and 3

Barrier I.D.: Evaluated Barrier 9 Alternatives 1C, 2, and 3														
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
R228	4	66	65	1	65	1	65	1	65	1	65	1	65	1
R229	3	62	61	1	61	1	61	1	61	1	60	2	60	2

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

North of Stone Valley Road (Evaluated Barrier 10)

Outdoor areas of the residences east of northbound I-680, represented by Receptors ST-70, ST-72, R262, and R263, were identified for noise abatement because modeled Design Year (2047) Build condition noise levels would approach or exceed the NAC at Receptor ST-70 under all Build Alternatives. Evaluated Barrier 10 was modeled along northbound I-680 ROW, extending approximately 800 feet.

Table 2.2.7-60 shows the Design Year (2047) Build condition noise levels and insertion loss for Evaluated Barrier 10 at various design heights. Evaluated Barrier 10 would feasibly abate traffic noise at a minimum height of 10 feet and would meet the 7 dB noise reduction goal at a minimum height of 14 feet. Therefore, Barrier 10 was carried forward into the Draft NADR and is further described below in the *Preliminary Noise Abatement Decision* section. The reasonable allowance calculated for a barrier height of 14 feet or greater was $146,000.

Table 2.2.7-60. Evaluated Barrier 10 Alternatives 1C, 2, 3, and 5

Barrier I.D.: Evaluated Barrier 10 Alternatives1C, 2, 3, and 5														
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-70	1	70	67	3	66	4	65	5	64	6	63	7	63	7
ST-72	2	55	55	0	54	1	54	1	54	1	54	1	54	1

Barrier I.D.: Evaluated Barrier 10 Alternatives1C, 2, 3, and 5														
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
R262	2	48	48	0	48	0	48	0	48	0	48	0	48	0
R263	1	56	56	0	56	0	55	1	55	1	55	1	55	1

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

South of Stone Valley Road (Evaluated Barrier 11)

Outdoor areas of the residences east of northbound I-680, represented by Receptors ST-77 and R272, were identified for noise abatement because modeled Design Year (2047) Build condition noise levels would approach or exceed the NAC under all build Alternatives. Evaluated Barrier 11 was modeled along I-680 northbound ROW, extending approximately 1,095 feet.

Table 2.2.7-61 shows the 2047 Alternative 1C Build noise levels and insertion loss for Evaluated Barrier 11 at various design heights. Evaluated Barrier 11 would not feasibly abate traffic noise or meet the 7 dB noise reduction goal at impacted Receptors ST-77 or R272, even at a height of 16 feet. Therefore, reasonable allowances were not calculated for Evaluated Barrier 11.

Table 2.2.7-61. Evaluated Barrier 11 Alternative 1C, 2, 3, and 5

Barrier I.D.: Evaluated Barrier 11 Alternative 1C, 2, 3, and 5														
Receptor ID	Units Represented	Design Year (2047) Noise Level w/o Wall	With Wall H=6 feet		With Wall H=8 feet		With Wall H=10 feet		With Wall H=12[2] feet		With Wall H=14[2] feet		With Wall H=16[2] feet	
			$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]	$L_{eq[h]}$	I.L.[1]
ST-77	1	69	69	0	69	0	68	1	68	1	68	1	67	2
R272	1	70	70	0	70	0	68	2	68	2	68	2	67	3

Source: (Illingworth & Rodkin, Inc., 2024)
Notes:
[1] I.L. = Insertion Loss; H = Height; w/o = Without; I.D. = Identification
[2] Barrier breaks line-of-sight between 11.5-foot-high truck stack and 5-foot-high receptor.

Preliminary Reasonableness Analyses Summary

Noise abatement is needed and acoustically feasible at four locations for Alternatives 1C and 3, three locations for Alternative 2, and two locations for Alternative 5. Barrier 2 is being considered for reasonableness for all Build Alternatives due to a prior commitment to construct a soundwall at this location. In addition, although it was determined that Barrier RSM-RW2 would not feasibly abate traffic noise or meet the 7dB noise reduction goal, it is being recommended for construction under Alternatives 1C, 2, and 3 because it would replace in-kind an existing noise barrier at this location that would be removed for pavement widening.

Build Alternative 1C

Fourteen potential noise barriers were evaluated preliminarily for feasibility and acoustical reasonableness under Alternative 1C. Of the barriers evaluated, only Existing Barrier E.1/SW No. 4/M242-RW1/Barrier E.3/SW No.3; Evaluated Barrier 5/24-RW2/SW No.1/24-RW4; Evaluated Barrier 6; and Evaluated Barrier 10 achieved Caltrans' design goal (i.e., minimum 7 dB reduction for at least one receptor).

Table 2.2.7-62 provides a summary of the reasonable monetary allowances for each of these barriers. Cost-effectiveness, which was assessed and documented in the Draft NADR, is further described below in the *Preliminary Noise Abatement Decision* section.

Table 2.2.7-62. Summary of Acoustically Feasible Noise Barriers and Reasonable Monetary Allowances under Alternative 1C

Barrier ID	Approximate Stationing/ Location [a]	Noise Level w/o Barrier at Benefited Receptors ($L_{eq(h)}$)	Barrier Height (feet)	Insertion Loss (dBA)	Number of Benefited Receptors	Total Reasonable Monetary Allowance
Existing Barrier E.1, SW No. 4, M242-RW1, Exiting Barrier E.3, SW No. 3	Along NB I-680 from Monument Boulevard to SR-242 Interchange	66	14[b]	7	7	$1,022,000
			16[b]	7	7	$1,022,000
Evaluated Barrier 5, 24-RW2, SW No. 1, 24-RW4	I-680/SR-24 Interchange along SB I-680, EB SR-24, and Off-ramp	70–73	16[b]	6–7	5	$730,000
		56–71	12	5	14	$2,044,000

Barrier ID	Approximate Stationing/ Location [a]	Noise Level w/o Barrier at Benefited Receptors ($L_{eq(h)}$)	Barrier Height (feet)	Insertion Loss (dBA)	Number of Benefited Receptors	Total Reasonable Monetary Allowance
Evaluated Barrier 2 [d]	Between Treat Boulevard and Parkside Drive		14	6	14	$2,044,000
			16	6	17	$2,482,000
Evaluated Barrier 6	I-680 Northbound SR-24 WB Ramp	65–72	10	6–9	16	$2,336,000
			12[b]	5–10	20	$2,920,000
			14[b]	5–10	20	$2,920,000
			16[b]	6–11	20	$2,920,000
Evaluated Barrier 10	North of Stone Valley Road along NB I-680	70	14[b]	7	1	$146,000
			16[b]	7	1	$146,000

Source: (Illingworth & Rodkin, Inc., 2024)
Notes: NB = northbound, RW = retaining wall, SB = southbound, SR = State Route, SW = soundwall, WB = westbound
[a] Barrier lengths are based on linear approximations used for purposes of noise modeling in TNM 2.5. Actual lengths may differ slightly due to barrier curvature, etc.
[b] Barrier breaks line of sight between 11.5-foot-high truck stack and 5-foot-high receptor.
[c] Insertion loss is the reduction in noise due to the noise barrier.
[d] Barrier 2 was not included in Noise Study Report Table ES-1.
[e] Based on base reasonable allowance of $146,000 per benefited receptor.

Build Alternative 2 (Preferred Alternative)

Thirteen potential noise barriers were evaluated preliminarily for feasibility and acoustical reasonableness under Alternative 2. Of the barriers evaluated, only Existing Barrier E.1/SW No. 4/M242-RW1/Barrier E.3/SW No.3; Evaluated Barrier 5/24-RW2/SW No.1/24-RW4; Evaluated Barrier 6; and Evaluated Barrier 10 achieved Caltrans' design goal (i.e., minimum 7 dB reduction for at least one receptor). Table 2.2.7-63 provides a summary of the reasonable monetary allowances for each of these barriers. Cost-effectiveness, which was assessed and documented in the Draft NADR, is further described in the *Preliminary Noise Abatement Decision* section.

Table 2.2.7-63. Summary of Acoustically Feasible Noise Barriers and Reasonable Monetary Allowances under Alternative 2

Barrier ID	Approximate Stationing/ Location [a]	Noise Level w/o Barrier at Benefited Receptors ($L_{eq(h)}$)	Barrier Height (feet)	Insertion Loss (dBA)	Number of Benefited Receptors	Total Reasonable Monetary Allowance
Existing Barrier E.1, SW No. 4, M242-RW1, Existing Barrier E.3, SW No. 3	Along NB I-680 from Monument Boulevard to SR-242 Interchange	66	14[b]	7	7	$1,022,000
			16[b]	7	7	$1,022,000
Evaluated Barrier 2 [d]	Between Treat Boulevard and Parkside Drive	57–65	12	5	5	$730,000
			14	6	17	$2,482,000
			16	6	27	$3,942,000
Evaluated Barrier 6	I-680 northbound SR-24 westbound ramp	65–72	8	6-7	16	$2,336,000
			10	6-9	16	$2,336,000
			12[b]	5–10	20	$2,920,000
			14[b]	5–10	20	$2,920,000
			16[b]	6–11	20	$2,920,000
Evaluated Barrier 10	North of Stone Valley Road along NB I-680	70	14[b]	7	1	$146,000
			16[b]	7	1	$146,000

Source: (Illingworth & Rodkin, Inc., 2024)
Notes: NB = northbound, RW = retaining wall, SB = southbound, SR = State Route, SW = soundwall, WB = westbound
[a] Barrier lengths are based on linear approximations used for purposes of noise modeling in TNM 2.5. Actual lengths may differ slightly due to barrier curvature, etc.
[b] Barrier breaks line of sight between 11.5-foot-high truck stack and 5-foot-high receptor.
[c] Insertion loss is the reduction in noise due to the noise barrier.
[d] Barrier 2 was not included in Noise Study Report Table ES-1.
[e] Based on base reasonable allowance of $146,000 per benefited receptor.

Build Alternative 3

Thirteen potential noise barriers were evaluated preliminarily for feasibility and acoustical reasonableness under Alternative 3. Of the barriers evaluated, only Existing Barrier E.1/SW No. 4/M242-RW1/Barrier E.3/SW No.3; Evaluated Barrier 5/24-RW2/SW

No.1/24-RW4; Evaluated Barrier 6; and Evaluated Barrier 10 achieved Caltrans' design goal (i.e., minimum 7 dB reduction for at least one receptor). Table 2.2.7-64 provides a summary of the reasonable monetary allowances for each of these barriers. Cost-effectiveness, which was assessed and documented in the Draft NADR, is further described below in the *Preliminary Noise Abatement Decision* section.

Table 2.2.7-64. Summary of Acoustically Feasible Noise Barriers and Reasonable Monetary Allowances under Alternative 3

Barrier ID	Approximate Stationing/ Location a	Noise Level w/o Barrier at Benefited Receptors ($L_{eq(h)}$)	Barrier Height (feet)	Insertion Loss (dBA)	Number of Benefited Receptors	Total Reasonable Monetary Allowance
Existing Barrier E.1, SW No. 4, M242-RW1, Existing Barrier E.3, SW No. 3	Along NB I-680 from Monument Boulevard to SR-242 Interchange	66	14[b]	7	7	$1,022,000
			16[b]	7	7	$1,022,000
Evaluated Barrier 5, 24-RW2, SW No. 1, 24-RW4	I-680/SR-24 Interchange along SB I-680, EB SR-24, and off-ramp	71	16[b]	6-7	5	$730,000
Evaluated Barrier 2 [d]	Between Treat Boulevard and Parkside Drive	57–65	12	5	5	$730,000
			14	6	17	$2,482,000
			16	6	27	$3,942,000
Evaluated Barrier 6	I-680 northbound SR-24 westbound ramp	64–74	10	5–8	16	$2,336,000
			12[b]	5–9	20	$2,920,000
			14[b]	5–9	20	$2,920,000
			16[b]	6–10	20	$2,920,000
Evaluated Barrier 10	North of Stone Valley Road along NB I-680	70	14[b]	7	1	$146,000
			16[b]	7	1	$146,000

Barrier ID	Approximate Stationing/ Location a	Noise Level w/o Barrier at Benefited Receptors ($L_{eq[h]}$)	Barrier Height (feet)	Insertion Loss (dBA)	Number of Benefited Receptors	Total Reasonable Monetary Allowance

Source: (Illingworth & Rodkin, Inc., 2024)
Notes: NB = northbound, RW = retaining wall, SB = southbound, SR = State Route, SW = soundwall, WB = westbound
[a] Barrier lengths are based on linear approximations used for purposes of noise modeling in TNM 2.5. Actual lengths may differ slightly due to barrier curvature, etc.
[b] Barrier breaks line of sight between 11.5-foot-high truck stack and 5-foot-high receptor.
[c] Insertion loss is the reduction in noise due to the noise barrier.
[d] Barrier 2 was not included in Noise Study Report Table ES-1.
[e] Based on base reasonable allowance of $146,000 per benefited receptor.

Build Alternative 5

Ten potential were evaluated preliminarily for feasibility and acoustical reasonableness under Alternative 5. Of the barriers evaluated, only Evaluated Barrier 6 and Evaluated Barrier 10achieved Caltrans' design goal (i.e., minimum 7 dB reduction for at least one receptor). Table 2.2.7-65 provides a summary of the reasonable monetary allowances for each of these barriers. Cost-effectiveness, which was assessed and documented in the Draft NADR, is further described in the *Preliminary Noise Abatement Decision* section.

Table 2.2.7-65. Summary of Acoustically Feasible Noise Barriers and Reasonable Monetary Allowances under Alternative 5

Barrier ID	Approximate Stationing/ Location [a]	Noise Level w/o Barrier at Benefited Receptors ($L_{eq[h]}$)	Barrier Height (feet)	Insertion Loss (dBA)	Number of Benefited Receptors	Total Reasonable Monetary Allowance
Evaluated Barrier 2 [d]	Between Treat Boulevard and Parkside Drive	57–65	12	5	5	$730,000
			14	6	17	$2,482,000
			16	6	27	$3,942,000
Evaluated Barrier 6	I-680 northbound SR-24	63–73	10	5–8	16	$2,336,000
			12[b]	5–9	20	$2,920,000

Barrier ID	Approximate Stationing/ Location [a]	Noise Level w/o Barrier at Benefited Receptors ($L_{eq[h]}$)	Barrier Height (feet)	Insertion Loss (dBA)	Number of Benefited Receptors	Total Reasonable Monetary Allowance
	westbound ramp		14[b]	5–9	20	$2,920,000
			16[b]	6–10	20	$2,920,000
Evaluated Barrier 10	North of Stone Valley Road along NB I-680	70	14[b]	7	1	$146,000
			16[b]	7	1	$146,000

Source: (Illingworth & Rodkin, Inc., 2024)
Notes: NB = northbound, RW = retaining wall, SB = southbound, SR = State Route, SW = soundwall, WB = westbound
[a] Barrier lengths are based on linear approximations used for purposes of noise modeling in TNM 2.5. Actual lengths may differ slightly due to barrier curvature, etc.
[b] Barrier breaks line of sight between 11.5-foot-high truck stack and 5-foot-high receptor.
[c] Insertion loss is the reduction in noise due to the noise barrier.
[d] Barrier 2 was not included in Noise Study Report Table ES-1.
[e] Based on base reasonable allowance of $146,000 per benefited receptor.

Preliminary Noise Abatement Decisions

As described above, four barriers/systems were identified as acoustically feasible under Alternatives 1C and 3, three barriers/systems were identified as acoustically feasible under Alternative 2 (preferred alternative), and two barriers were identified as acoustically feasible under Alternative 5. Although determined not to be acoustically feasible in the Noise Study Report, Evaluated Barrier 2 was considered for reasonableness for all Build Alternatives because of prior commitments to evaluate a barrier at this location. Table 2.2.7-66 to Table 2.2.7-69 summarizes acoustical feasibility, number of residences benefited, total reasonableness allowance, engineer's cost estimate for the abatement, and comparison of cost versus allowance for these barriers/systems. The evaluated noise barrier locations are provided in Appendix J.2.

Table 2.2.7-66. Summary of Abatement Key Information (Alternative 1C)

Barrier ID[1]	Type and No. of Benefited Land Uses	Barrier Height/ Total Length	Acoustically Feasible?	Maximum Insertion Loss (dB)	Number of Benefited Residences	Design Goal Achieved?	Total Reasonable Allowance [2]	Estimated Construction Cost	Cost Less than Allowance?
E.1, SW No. 4, M242-RW1, E.3, SW No. 3	7 SFR	14	YES	7	7	YES	$1,022,000	$963,374	YES
		16	YES	7	7	YES	$1,022,000	$1,103,306	NO [3]
5, 24-RW2, SW No.1, 24-RW4	5 SFR	16	YES	7	5	YES	$730,000	$3,933,743	NO
2	14–17 SFR/MFR	12	YES	5	14	NO	$2,044,000	$1,026,423	YES
		14	YES	6	14	NO	$2,044,000	$1,197,494	YES
		16	YES	6	17	NO	$2,482,000	$1,368,564	YES
6	16–20 MFR	10	YES	8	16	YES	$2,336,000	$4,055,438	NO
		12	YES	9	20	YES	$2,920,000	$4,197,706	NO
		14	YES	9	20	YES	$2,920,000	$4,339,974	NO
		16	YES	10	20	YES	$2,920,000	$4,482,242	NO
10	1 SFR	14	YES	7	1	YES	$146,000	$575,703	NO
		16	YES	7	1	YES	$146,000	$657,946	NO

Source: (California Department of Transportation, 2024)
Notes: E.# = Existing Barrier, SW = Soundwall, RW = Retaining Wall, SFR = Single-Family Residence, MFR = Multi-Family Residence
1. All barriers are Evaluated Barriers unless otherwise noted as existing.
2. Based on the base reasonable allowance of $146,000 per benefited receptor.
3. Could be considered reasonable because within 10%.

Table 2.2.7-67. Summary of Abatement Key Information (Alternative 2 – Preferred Alternative)

Barrier ID [1]	Type and No. of Benefited Land Uses	Barrier Height / Total Length	Acoustically Feasible?	Maximum Insertion Loss (dB)	Number of Benefited Residences	Design Goal Achieved?	Total Reasonable Allowance [2]	Estimated Construction Cost	Cost Less than Allowance?
E.1, SW No. 4, M242-RW1, E.3, SW No. 3	7 SFR	14	YES	7	7	YES	$1,022,000	$963,374	YES
		16	YES	7	7	YES	$1,022,000	$1,103,306	NO [3]
2	5–27 SFR/MFR	12	YES	5	5	NO	$730,000	$3,323,900	NO
		14	YES	6	17	NO	$2,482,000	$3,558,300	NO
		16	YES	6	27	NO	$3,942,000	$3,792,700	YES
6	16–20 MFR	10	YES	9	16	YES	$2,336,000	$4,055,438	NO
		12	YES	10	20	YES	$2,336,000	$4,197,706	NO
		14	YES	10	20	YES	$2,920,000	$4,339,974	NO
		16	YES	11	20	YES	$2,920,000	$4,482,242	NO
10	1 SFR	14	YES	7	1	YES	$2,920,000	$575,703	NO
		16	YES	7	1	YES	$146,000	$657,946	NO

Source: (California Department of Transportation, 2024)
Notes: E.# = Existing Barrier, SW = Soundwall, RW = Retaining Wall, SFR = Single-Family Residence, MFR = Multi-Family Residence
1. All barriers are Evaluated Barriers unless otherwise noted as existing.
2. Based on the base reasonable allowance of $146,000 per benefited receptor.
3. Could be considered reasonable because within 10%.

Table 2.2.7-68. Summary of Abatement Key Information (Alternative 3)

Barrier ID[1]	Type and No. of Benefited Land Uses	Barrier Height/ Total Length	Acoustically Feasible?	Maximum Insertion Loss (dB)	Number of Benefited Residences	Design Goal Achieved?	Total Reasonable Allowance[2]	Estimated Construction Cost	Cost Less than Allowance?
E.1, SW No. 4, M242-RW1, E.3, SW No. 3	7 SFR	14	YES	7	7	YES	$1,022,000	$963,374	YES
		16	YES	7	7	YES	$1,022,000	$1,103,306	NO [3]
5, 24-RW2, SW No.1, 24-RW4	5 SFR	16	YES	7	5	YES	$730,000	$3,933,743	NO
2	5–27 SFR/MFR	12	YES	5	5	NO	$730,000	$3,323,900	NO
		14	YES	6	17	NO	$2,482,000	$3,558,300	NO
		16	YES	6	27	NO	$3,942,000	$3,792,700	YES
6	16–20 MFR	10	YES	8	16	YES	$2,336,000	$4,055,438	NO
		12	YES	9	20	YES	$2,920,000	$4,197,706	NO
		14	YES	9	20	YES	$2,920,000	$4,339,974	NO
		16	YES	10	20	YES	$2,920,000	$4,482,242	NO
10	1 SFR	14	YES	7	1	YES	$146,000	$575,703	NO
		16	YES	7	1	YES	$146,000	$657,946	NO

Source: (California Department of Transportation, 2024)
Notes: E.# = Existing Barrier, SW = Soundwall, RW = Retaining Wall, SFR = Single-Family Residence, MFR = Multi-Family Residence
1. All barriers are Evaluated Barriers unless otherwise noted as existing.
2. Based on the base reasonable allowance of $146,000 per benefited receptor.
3. Could be considered reasonable because within 10%.

Table 2.2.7-69. Summary of Abatement Key Information (Alternative 5)

Barrier ID [1]	Type and No. of Benefited Land Uses	Barrier Height/ Total Length	Acoustically Feasible?	Maximum Insertion Loss (dB)	Number of Benefited Residences	Design Goal Achieved?	Total Reasonable Allowance [2]	Estimated Construction Cost	Cost Less than Allowance?
2	5–27 SFR/MFR	12	YES	5	5	NO	$730,000	$3,323,900	NO
		14	YES	6	17	NO	$2,482,000	$3,558,300	NO
		16	YES	6	27	NO	$3,942,000	$3,792,700	YES
6	16–20 MFR	10	YES	8	16	YES	$2,336,000	$4,055,438	NO
		12	YES	9	20	YES	$2,920,000	$4,197,706	NO
		14	YES	9	20	YES	$2,920,000	$4,339,974	NO
		16	YES	10	20	YES	$2,920,000	$4,482,242	NO
10	1 SFR	14	YES	7	1	YES	$146,000	$575,703	NO
		16	YES	7	1	YES	$146,000	$657,946	NO

Source: (California Department of Transportation, 2024)
Notes: E.# = Existing Barrier, SW = Soundwall, RW = Retaining Wall, SFR = Single-Family Residence, MFR = Multi-Family Residence
1. All barriers are Evaluated Barriers unless otherwise noted as existing.
2. Based on the base reasonable allowance of $146,000 per benefited receptor.

Based on the studies completed to date and input from the public, Caltrans intends to incorporate noise abatement in the form of barriers at the following locations:

- Noise Barrier System (E.1/SW No. 4/M242-RW1/E.3/SW No. 3), with respective length of 1,399 feet and an average height of 14 feet for Alternatives 1C, 2, and 3. Calculations based on preliminary design data show that the barrier(s) will reduce noise levels by 5 to 7 dB for seven residences at a cost of $963,374, which is less than Caltrans' cost allowance of $1,022,000. This system would also replace existing soundwalls in-kind. A barrier height of 16 feet could be considered reasonable because construction cost or $1,103,306 is within 10 percent of Caltrans' cost allowance; but is not recommended because it would benefit the same number of receivers as a 14-foot sound barrier system.

- Noise Barrier System (5/24-RW2/SW No.1/24-RW4), with respective length of 3,040 feet and average height of 16 feet under Alternatives 1C and 3. Calculations based on preliminary design data show that the barrier(s) would reduce noise levels by 5 to 7 dB for five residences at a cost of $3,933,743. Although this system would meet the design goal of 7 dB, it would exceed Caltrans' cost allowance of $730,000. This system was recommended for Alternatives 1C and 3, which would remove existing soundwalls at this location, and this system would replace those existing soundwalls in-kind. This barrier system is no longer recommended for construction following selection of Alternative 2 as the preferred alternative.

- Evaluated Barrier 2, with respective lengths of 1,711 feet under Alternative 1C and 2,344 feet under Alternatives 2, 3, and 5, and an average height of approximately 16 feet. Evaluated Barrier 2 is found to be reasonable to construct based on the cost perspective for Alternatives 1C, 2, and 3. However, Caltrans is recommending the barrier for construction for all Build Alternatives due to the prior commitment to construct the barrier in the *I-680 Southbound HOV Gap Closure Project* (SCH# 2013102020), provided that a majority of the benefited receptors are in favor of the barrier's construction.

Although Evaluated Barriers 6 and 10 would either be acoustical feasibility (5 dB noise reduction) or meet the design goal (7 dB noise reduction), these barriers would exceed Caltrans' cost allowance and are not recommended for construction.

North of Rudgear Road, a portion of an existing noise barrier would be removed and replaced by Barrier RSM-RW2 under Alternatives 1C, 2, and 3. Barrier RSM-RW2 would not feasibly abate traffic noise or meet the 7 dB noise reduction goal, even at a height of 16 feet. Barrier RSM-RW2 is recommended to be constructed at a height of 12 feet above grade for Alternatives 1C, 2, and 3.

The viewpoints of receptors that benefit from the project (i.e. acceptance of the abatement by benefitted receptors as determined by a survey) is also considered for noise abatement. Benefitted receptors are defined as those receptors that are predicted

to receiving at least 5 dB of noise reduction from the proposed abatement. If more than 50 percent of the benefited receptors oppose the abatement, the abatement will not be considered reasonable. Following selection of the preferred alternative, a survey of benefited receptors was conducted in January through February 2025. Based on the following survey results, both barrier systems would be considered reasonable:

Noise Barrier E.1/SW No.4/M242-RW1/E.3/SW No.3
Number of Benefitted Receptors: 7
Number of Survey Respondents: 1
Number of Survey Respondents that Oppose the Barrier: 0
More than 50 Percent of Benefitted Receptors Oppose the Barrier (Yes/No): No
Barrier is Reasonable Based on Viewpoints of Benefitted Receptors (Yes/No): Yes

Noise Barrier 2
Number of Benefitted Receptors: 27
Number of Survey Respondents: 3
Number of Survey Respondents that Oppose the Barrier: 1
More than 50 Percent of Benefitted Receptors Oppose the Barrier (Yes/No): No
Barrier is Reasonable Based on Viewpoints of Benefitted Receptors (Yes/No): Yes

If conditions have changed substantially during final design, noise abatement may not be constructed. The final decision on noise abatement will be made upon completion of the Project design.

Construction Measures

NOI-1 During construction, the Project's Resident Engineer or their designated contractor will ensure the following measures be implemented during Project construction to reduce the potential for temporary noise impacts.

- All construction equipment shall conform to SSP14-8.02, *Noise Control*, which requires noise not to exceed 52 dBA, preparation of a Noise Control Plan (NCP) and noise monitoring.
- When feasible, noise-generating construction activities shall be restricted to between 7:00 a.m. and 7:00 p.m. on weekdays, with no construction occurring on weekends or holidays. If work is necessary outside of these hours, Caltrans shall require the contractor to implement a construction noise monitoring program and provide additional noise controls where practical and feasible.
- Pile driving activities shall be limited to daytime hours only.
- All internal combustion engine driven equipment shall be equipped with manufacturer recommended intake and exhaust mufflers that are in good condition and appropriate for the equipment.

- Unnecessary idling of internal combustion engines shall be strictly prohibited.
- Noise-generating equipment shall be located as far as practical from sensitive receptors when sensitive receptors adjoin or are near the construction Project area.
- "Quiet" air compressors and other "quiet" equipment shall be utilized where such technology exists.

VIB-1 During construction, the Project's Resident Engineer or their designated contractor will ensure that the following measures be implemented during Project construction to reduce the potential for temporary vibration impacts.

- Prohibit impact or vibratory pile driving methods when within the exceedance distances from vibration-sensitive structures as listed in Table 2.2.7-4. Cast-in-Drilled Hole (CIDH) Piles is an alternative method that causes lower vibration levels. CIDH Piles should be used where geological conditions permit their use.
    - CIDH piles would exceed the 0.25-inches per second PPV threshold for historic structures at 10 feet, the 0.3-inches per second PPV threshold for older structures at 9 feet, and the 0.5-inches per second PPV threshold for newer construction structures at 6 feet.
- Avoid the use of vibratory rollers within 25 feet of sensitive structures. Static mode compaction shall be used when construction activities are less than 25 feet from sensitive structures.
- Avoid dropping heavy objects or equipment within 25 feet of sensitive structures.
- Place operating equipment on the construction site as far as possible from vibration-sensitive receptors.
- Designate a person responsible for registering and investigating claims of excessive vibration. The contact information of such person shall be clearly posted on the construction site.

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2.2.8 Energy

2.2.8.1 Regulatory Setting

The National Environmental Policy Act (NEPA) (42 United States Code [USC] Part 4332) requires the identification of all potentially significant impacts to the environment, including energy impacts.

The California Environmental Quality Act (CEQA) Guidelines section 15126.2(b) and Appendix F, Energy Conservation, require an analysis of a project's energy use to determine if the project may result in significant environmental effects due to wasteful, inefficient, or unnecessary use of energy, or wasteful use of energy resources.

Federal Plans, Policies, and Regulations

Energy Policy Act of 1992

The Energy Policy Act of 1992 aims to reduce United States (U.S.) dependence on petroleum and improve air quality by addressing all aspects of energy supply and demand, including alternative fuels, renewable energy, and energy efficiency.

Energy Policy Act of 2005

The Energy Policy Act of 2005 calls for the development of grant programs, demonstration and testing initiatives, and tax incentives that promote alternative fuels and advanced vehicle production and use. It also amends existing regulations, including fuel economy testing procedures and the Energy Policy Act of 1992 requirements for federal, State, and alternative fuel provider fleets.

Energy Independence and Security Act of 2007

The Energy Independence and Security Act of 2007 aims to improve vehicle fuel economy and reduce U.S. dependence on petroleum. The Act also includes provisions to increase the supply of renewable alternative fuel sources by setting a mandatory Renewable Fuel Standard, which required transportation fuel sold in the U.S. to contain a minimum of 36 billion gallons of renewable fuels annually by 2022. The Act set the Corporate Average Fuel Economy standard at 35 miles per gallon for passenger cars and light trucks by the year 2020. The law is projected to reduce greenhouse gas (GHG) emissions by 9 percent by 2030.

State Plans, Policies, and Regulations

California Senate Bill 100 "The 100 Percent Clean Energy Act of 2018"

California Senate Bill 100 established a landmark policy requiring that renewable energy and zero-carbon resources supply 100 percent of electric retail sales to end-use

customers by 2045. This bill targets 60 percent renewable energy by 2030 and commits to a 100 percent zero-carbon energy supply by 2045.

Executive Order N-79-20 "Zero-Emission by 2035"

Executive Order N-79-20 would end sales of internal combustion passenger vehicles by 2035, which would establish a target for the transportation sector that would help put the state on a path to carbon neutrality by 2045. The Executive Order provides time for automakers to scale up and market new zero-emissions vehicles, as well as further impetus for the providers of charging and refueling infrastructure, electric utilities, and others to plan for and support the increasing consumer demand for these vehicles.

Regional Plans, Policies, and Regulations

Contra Costa County

Plan Bay Area 2050

Plan Bay Area 2050 was adopted on October 21, 2021, by the Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments (ABAG) to outline the future of housing, the economy, transportation, and the environment for the nine counties in the San Francisco Bay Area through the year 2050 (Association of Bay Area Governments and Metropolitan Transportation Commission, 2022). This regional plan does not fund specific infrastructure projects but does suggest the potential for future investments in infrastructure to improve the transportation system and protect communities from sea level rise caused by climate change. The plan also encourages partnerships among local, State, and federal governments to fulfill the 80 actions outlined in the regional plan.

Contra Costa County Renewable Resource Potential Study

Contra Costa County's *Renewable Resource Potential Study* was released on December 13, 2018, by the County's Department of Conservation and Development. The study identifies opportunities that Contra Costa County can use to expand its leadership in local clean energy production and to bring clean energy's benefits to County constituents broadly (Contra Costa County Department of Conservation and Development, 2018). Its primary purposes are to quantify the magnitude of available renewable energy resources, identify where resources could be located within Contra Costa County, explore typical cost levels associated with each resource type and subtype, identify constraints and tradeoffs associated with developing resources in each location, and evaluate existing options for updating policy and zoning to facilitate development of renewable resources in Contra Costa County while remaining mindful of long-term planning considerations and potential tradeoffs.

2015 Climate Action Plan

The *2015 Climate Action Plan* (CAP) identifies how Contra Costa County would achieve the Assembly Bill (AB) 32 GHG emissions reduction target of 15 percent below baseline levels by the year 2020, in addition to supporting other public health, energy efficiency, water conservation, and air quality goals identified in Contra Costa County's *General Plan* and other policy documents (Contra Costa County, 2015).

Local Plans, Policies, and Regulations

City of Walnut Creek

City of Walnut Creek General Plan

The *City of Walnut Creek General Plan* serves as the City of Walnut Creek's "constitution" for conservation, land use, and community development, providing the legal foundation for all zoning and subdivision ordinances, decisions, and projects—all of which must be consistent with the *General Plan*. The City of Walnut Creek's *General Plan* includes the following goals related to energy and transportation:

- **Goal 1:** Minimize future congestion increases on regional transportation facilities.
    - Policy 1.1: In cooperation with State and regional agencies and other jurisdictions, develop and implement regional solutions to local traffic problems created by growth outside the city.
- **Goal 8:** Serve as a model for other cities by providing a comprehensive Transportation Demand Management (TDM) program that strives to decrease automobile use and reduce peak-period traffic congestion.
- **Goal 28:** Promote energy conservation.

City of Pleasant Hill

City of Pleasant Hill General Plan

The *City of Pleasant Hill General Plan* addresses key planning issues raised by citizens. In the City of Pleasant Hill's *General Plan*, the following goals relate to energy and transportation:

- **Circulation Goal 1:** Establish and maintain a safe and efficient circulation system that emphasizes the use of existing arterial and collector roadways, paths, and bike lanes.
- **Circulation Goal 2:** Decrease traffic delays associated with specific streets and uses.

City of Concord

City of Concord General Plan

The *City of Concord General Plan* establishes a vision and priorities for the City of Concord through 2030. The City of Concord's *General Plan* illustrates a long-range vision that reflects the community's aspirations and outlines steps to achieve this vision. In the City of Concord's *General Plan*, the following goals and policies relate to energy and transportation:

- **Goal GM-4:** Reduce the number and length of commute trips made by single-occupant vehicles.
- **Goal GM-4.1.1:** Promote reduced commute trips and lengths.
- **Goal T-1:** Provide a safe and efficient multi-modal transportation system.
    - Policy T-1.1.2: Maintain and upgrade transportation systems to provide smooth traffic flow, minimize vehicle emissions, and save energy.

City of Martinez

City of Martinez General Plan

The *City of Martinez General Plan* is intended to provide policy guidance for future decision-making in the following topic areas: land use, open space and conservation, historic and cultural resources, parks and community facilities, circulation, public safety, noise and air quality, environmental justice and disadvantaged communities, and growth management. In the City of Martinez's *General Plan*, the following goals and policies relate to energy and transportation:

- **Goal OSC-G-6:** Reduce energy, water, and resource consumption.
- **Goal OSC-G-7:** Reduce energy use to limit air pollution and the likelihood of power outages.
- **Goal C-G-2:** Maintain and/or improve mobility in the city by considering alternative circulation system improvements.
    - Policy C-P-2.3: Ensure compatibility and complementary relationships between the circulation system and existing and planned land uses, promoting environmental objectives, such as safe and uncongested neighborhoods, energy conservation, reduction of air and noise pollution, and access to bicycle, pedestrian, and transit facilities.

- **Goal C-G-14:** Continue to seek economical and dependable ways to serve the community, improve energy efficiency, and reduce energy demand wherever possible.

City of Martinez Climate Action Plan

The City of Martinez's CAP was established in June 2009, and it presents goals, principles, and strategies for reducing the city's GHG emissions, conserving energy and natural resources, and preparing the community for the expected effects of climate change. The City of Martinez's *General Plan* mentions Interstate 680 (I-680) as a major regional roadway that is used heavily for work travel.

2.2.8.2 Affected Environment

The following discussion is based on the Project's *Energy Analysis Report* (HDR Engineering, Inc., 2023), which was completed in December 2023. The Energy Resource Study Area (RSA) is the same as the Project Study Limits, as shown in Figure 1-2 in Chapter 1.0, *Proposed Project*.

Statewide Energy Consumption

The U.S. Energy Information Administration ranks California 48th in total energy consumption per capita. California's energy consumption by end-use sector for 2020 listed the transportation sector as having a statewide consumption of 34 percent. The transportation sector consumed more energy than any other sector, which includes industrial (24.6 percent), residential (21.8 percent), and commercial (19.6 percent). This is due primarily to the large travel distances between major cities. Additionally, California has the most registered motor vehicles and the most vehicle miles traveled of any state. According to the Federal Highway Administration (FHWA), California leads the U.S. in the number of motor vehicles.

California's transportation sector energy consumption for 2020 listed motor gasoline as having the highest percentage of total energy consumption (67.3 percent). In comparison to the other fuel types, distillate fuel oil had the second largest percentage of total energy consumption (21.9 percent). When compared to all energy sectors, motor gasoline represented 20.0 percent of the total statewide energy consumption. Distillate fuel oil, which includes diesel fuel for trucks and railroad locomotives, represented 7.3 percent of the total statewide energy consumption.

Countywide Energy Consumption

According to Contra Costa County's CAP, on-road transportation represented 47 percent of the total GHG emissions in 2013 (Contra Costa County, 2015). Similar to Statewide energy consumption, the transportation sector is the dominant contributor to energy consumption in the county.

Transportation Energy

Transportation energy is generally described in terms of direct and indirect energy, which are defined as follows:

Direct Energy

In the context of transportation, direct energy involves all energy consumed by vehicle propulsion (e.g., automobiles, trains, airplanes). This energy consumption is a function of traffic characteristics, such as vehicle miles traveled (VMT), speed, vehicle mix, and thermal value of fuel being used. Direct energy also includes the one-time energy expenditure involved in project construction. Therefore, analysis of direct energy use includes the following factors:

- Direct Energy (Mobile Sources): The energy consumed by vehicle propulsion within the facility during project operation.
- Direct Energy (Construction): The energy consumed by construction vehicles and equipment during project construction.

Indirect Energy

Indirect energy includes maintenance activities that would result in permanent indirect energy consumption by equipment required to operate and maintain the roadway. Indirect energy use may include peripheral energy effects. This includes the use of energy sources that are not used by the transportation system itself, but rather energy used as a result of changes in land use, population density, or transportation patterns that are induced by a project, which would affect the energy demand, supply, and distribution within the surrounding area.

Existing Roadway and Traffic Conditions

I-680 traverses north and south through Santa Clara, Alameda, Contra Costa, and Solano Counties and serves as a major north-south freeway connecting the southern San Francisco Bay area with Interstate 80, which crosses the Central Valley, including the Sacramento metropolitan area. The Project is located primarily within the cities of Walnut Creek, Pleasant Hill, Concord, and Martinez and the unincorporated community of Alamo within Contra Costa County (Community of Alamo). I-680 is a divided freeway separated by a concrete median barrier.

Currently, a northbound high-occupancy vehicle (HOV) lane exists north of State Route (SR) 242, and a northbound HOV/express lane exists south of Livorna Road, creating a 7.5-mile gap in the existing northbound I-680 managed lane system. HOV lanes initiate at post mile (PM) R21.3 in Alameda County and continue into Contra Costa County as an HOV/high-occupancy toll (HOT) lane from Marina Vista Avenue in Martinez to Treat Boulevard in Walnut Creek and from Rudgear Road in Walnut Creek to Alcosta Boulevard in San Ramon.

Electricity and Natural Gas

As discussed in Section 2.1.7, *Utilities/Emergency Services*, Pacific Gas & Electric (PG&E) provides electrical and natural gas services within the Energy RSA. In 2021, PG&E's Power Content Label reported that its electricity supply was derived from 48 percent renewable, 39 percent nuclear, 9 percent natural gas, and 4 percent large hydro energy sources (Pacific Gas and Electric Company, 2022).

2.2.8.3 Environmental Consequences

No-Build Alternative

The No-Build Alternative would maintain the current configurations of I-680 in the Energy RSA. Under the No-Build Alternative, the Project would not be constructed, and no impacts on energy would occur. Existing gaps in the corridor would remain, and as future traffic demand increases, traffic conditions would further deteriorate and increase congestion, vehicle delay, and cause further expenditure of energy caused by traffic stall.

Build Alternatives (Alternatives 1C, 2, 3, and 5)

Consistency with Plans, Policies, and Regulations

Reduced peak-period congestion and delay on northbound I-680 would occur under all Build Alternatives, which would reduce travel time and improve travel time reliability for travelers in the corridor. The Build Alternatives would also encourage use of HOV lanes and transit services by optimizing the use of the existing HOV lane capacity in the I-680 corridor, which would better meet current traffic demands and support future demand. All Build Alternatives would address existing transportation problems, such as congestion, lack of system continuity, and existing operational deficiencies, as well as reduce energy consumption within the Project area, in compliance with all applicable federal, State, and local plans, policies, and regulations listed in Section 2.2.8.1, *Regulatory Setting*.

Short-Term (Construction) Impacts

Under all Build Alternatives, construction would involve temporary direct fuel usage associated with construction and equipment. Direct energy consumption was calculated for all Build Alternatives by the California Department of Transportation (Caltrans) Construction Emissions Tool 2021 version (Cal-CET2021) as part of the Project's *Air Quality Report* (Illingworth & Rodkin, Inc., 2024). As shown in Table 2.2.8-1, the estimated total diesel consumption is approximately 692,443 gallons for a construction duration of 24 months, and the total gasoline consumption under the Build Alternatives is approximately 211,011 gallons. The total electricity consumption is 58,376 kilowatt-hours (kWh).This fuel consumption was also evaluated with Tier 4 controls on diesel equipment as required by Measure **AQ-5**. The Tier 4 controls would not change the

consumption of gasoline or electricity but would slightly increase total diesel consumption to 692,602 gallons.

Construction would occur in the I-680 corridor under all Build Alternatives, but with slight variations in the number of lanes based on the Build Alternative. Therefore, all Build Alternatives would involve similar construction activities with small differences in construction energy consumption. Although the Build Alternatives would have different construction phases and energy use would depend on the construction equipment being used per activity, the average annual energy consumption during Project construction under the Build Alternatives would be approximately the same over the two-year construction span.

As discussed in Section 2.2.6, *Air Quality*, Caltrans Standard Specification Section 14-9 would be implemented requiring that the construction contractor comply with all applicable air quality regulations, which would include limiting idling time during construction. Energy consumption during construction would be minimized with the implementation of Measures **E-1** through **E-3**. A Transportation Management Plan (TMP) would also be implemented, which would reduce overall energy consumption by limiting traffic congestion and reducing the length of detours, as well as avoidance and minimization measures to minimize energy impacts during construction activities related to idling time for construction equipment and disposal of construction waste at local disposal sites. Further, the energy consumed during Project construction would be temporary and would not result in any permanent increase in statewide energy consumption. Project construction is anticipated to span 2 years, which would result in small increments of annual energy consumption per year. Therefore, no substantial temporary direct adverse impacts on energy resources are anticipated under the Build Alternatives.

Temporary indirect energy impacts would result from temporary disruptions to local circulation and connectivity during construction under all Build Alternatives. However, as discussed in Section 1.4.1.6, *Standardized Project Measures*, a TMP would be prepared in accordance with Caltrans' requirements and guidelines to minimize construction-related delays and inconvenience for travelers in the Project Study Limits. The TMP would minimize potential traffic impacts as they relate to staged construction, detours, and other traffic handling concerns associated with construction of the proposed Project under all Build Alternatives. Therefore, with the incorporation of the Standardized Project Measure regarding TMP preparation, no substantial temporary indirect adverse impacts on energy resources are anticipated under the Build Alternatives.

Table 2.2.8-1. Direct Energy Consumption During Project Construction - Uncontrolled

Construction Source	CO_2 Emissions (metric tons)	Gasoline Consumption (gallons)	Gasoline Consumption (billion Btu)	Electricity Consumption (kWh)	Electricity Consumption (billion Btu)	Diesel Consumption (gallons)	Diesel Consumption (billion Btu)
Roadway							
On-Road	2,740	118,892	14	37,450	0.13	139,863	19
Off-Road	2,897	0	0	0	0	268,781	37
Fugitive Dust	0	0	0	0	0	0	0
Painting and Asphalt Application	0	0	0	0	0	0	0
Bridge							
On-Road	2,008	92,119	11	20,925	0.07	98,138	13
Off-Road	1,995	0	0	0	0	185,661	26
Fugitive Dust	0	0	0	0	0	0	0
Painting and Asphalt Application	0	0	0	0	0	0	0
Total	**9,640**	**211,011**	**25**	**58,376**	**0.20**	**692,443**	**95**

Source: (HDR Engineering, Inc., 2023); (Illingworth & Rodkin, Inc., 2024)

Permanent (Operational) Impacts

Direct Energy Use (Mobile Sources)

The CT-EMFAC2021 results, as contained in the *Air Quality Report*, provided total fuel consumption for each Build Alternative. These values were used to estimate the annual gasoline, natural gas, diesel, and electricity consumption for each Build Alternative, as shown in Table 2.2.8-2.

Traffic congestion along the northbound I-680 corridor would be reduced under all Build Alternatives. As shown in Table 2.2.8-2, all Build Alternatives would result in less direct energy consumption than existing conditions. Alternatives 1C, 2, and 3 would result in slightly more direct energy consumption than the No-Build Alternative (0.03 percent to 0.07 percent). Alternative 5 would result in slightly less energy consumption than the No-Build Alternative (-0.79 percent to -1.13 percent). Congestion alleviation would allow vehicles to travel at normal speeds, improving vehicle fuel economies and traffic operations and resulting in decreased direct energy consumption. In addition, the Energy RSA is already urbanized and located along an existing transportation corridor. Under all Build Alternatives, the proposed Project would not be expected to induce substantial changes in land use, population density, or transportation patterns that would increase energy demand, supply, or distribution. Therefore, no permanent direct adverse impacts on energy resources are anticipated under the Build Alternatives.

Table 2.2.8-2. Estimated Annual Fuel Consumption

Gasoline Consumption (billion gallons)	Gasoline Consumption (billion Btu)	Diesel and Natural Gas Consumption (billion gallons)	Diesel and Natural Gas Consumption (billion Btu)	Electricity Consumption (billion Btu)	Total Fuel Consumption (billion Btu)	Percent Change from Existing Year (2020)	Percent Change from Opening Year (2027) No-Build Alternative	Percent Change from Design Year (2047) No-Build Alternative	Percent Change from Horizon Year (2050) No-Build Alternative
Existing Year 2020									
1.291	155,180.241	0.299	41,091.370	867.624	197,139.234	—	—	—	—
Opening Year (2027) No-Build Alternative									
1.163	139,846.772	0.260	35,703.001	2,825.247	178,375.020	-9.52%	—	—	—
Design Year (2047) No-Build Alternative									
1.046	125,686.101	0.203	27,843.878	8,626.898	162,156.876	-17.75%	—	—	—
Horizon Year (2050) No-Build Alternative									
1.058	127,237.626	0.203	27,820.928	8,963.120	164,021.673	-16.80%	—	—	—
Opening Year (2027) Alternative 1C									
1.164	139,971.660	0.260	35,728.123	2,826.872	178,526.654	-9.44%	0.09%	*10.10%*	*8.84%*
Design Year (2047) Alternative 1C									
1.046	125,760.601	0.203	27,862.683	8,631.467	162,254.751	-17.70%	*-9.04%*	0.06%	*-1.08%*
Horizon Year (2050) Alternative 1C									
1.059	127,319.153	0.203	27,841.352	8,967.968	164,128.473	-16.74%	*-7.99%*	*1.22%*	0.07%
Opening Year (2027) Alternative 2									
1.164	139,983.836	0.260	35,727.997	2,826.451	178,538.285	-9.44%	0.09%	*10.10%*	*8.85%*

Gasoline Consumption (billion gallons)	Gasoline Consumption (billion Btu)	Diesel and Natural Gas Consumption (billion gallons)	Diesel and Natural Gas Consumption (billion Btu)	Electricity Consumption (billion Btu)	Total Fuel Consumption (billion Btu)	Percent Change from Existing Year (2020)	Percent Change from Opening Year (2027) No-Build Alternative	Percent Change from Design Year (2047) No-Build Alternative	Percent Change from Horizon Year (2050) No-Build Alternative
Design Year (2047) Alternative 2									
1.046	125,726.647	0.203	27,855.627	8,628.344	162,210.618	-17.72%	*-9.06%*	0.03%	*-1.10%*
Horizon Year (2050) Alternative 2									
1.059	127,281.484	0.203	27,833.454	8,964.982	164,079.921	-16.77%	*-8.01%*	*1.19%*	0.04%
Opening Year (2027) Alternative 3									
1.164	139,950.070	0.260	35,721.376	2,826.550	178,497.995	-9.46%	0.07%	*10.08%*	*8.83%*
Design Year (2047) Alternative 3									
1.046	125,776.673	0.203	27,860.708	8,631.117	162,268.498	-17.69%	*-9.03%*	0.07%	*-1.07%*
Horizon Year (2050) Alternative 3									
1.059	127,327.154	0.203	27,838.073	8,967.220	164,132.447	-16.74%	*-7.98%*	*1.22%*	0.07%
Opening Year (2027) Alternative 5									
1.169	140,500.231	0.241	33,040.238	2,816.503	176,356.972	-10.54%	-1.13%	*8.76%*	*7.52%*
Design Year (2047) Alternative 5									
1.049	126,104.147	0.188	25,804.980	8,544.620	160,453.747	-18.61%	*-10.05%*	-1.05%	*-2.18%*
Horizon Year (2050) Alternative 5									
1.061	127,548.239	0.191	26,246.004	8,933.145	162,727.388	-17.46%	*-8.77%*	*0.35%*	-0.79%

Source: (HDR Engineering, Inc., 2023)
Notes: Btu=British Thermal Unit

Indirect Energy Use

Indirect energy includes maintenance activities that would result in long-term indirect energy consumption by equipment required to operate and maintain the roadway. As shown in Table 2.2.8-3, all Build Alternatives would result in an increase in indirect energy use of less than 1.0 percent in the Energy RSA compared to the No-Build Alternative in the same year (e.g., Opening Year [2027] No-Build to Opening Year [2027] Alternative 1C). There is about a 0.1 percent difference between the growth shown from Opening Year (2027) No-Build to Design Year (2047) No-Build and the Build Alternatives (11.9 to 12 percent). There is a similar difference between the growth shown from Opening Year (2027) No-Build to Horizon Year (2050) No-Build and Build Alternatives (13.7 to 13.8 percent). Therefore, all Build Alternatives would result in negligible changes in indirect energy use compared to the No-Build Alternative, and none of the Build Alternatives would contribute substantially to indirect energy use within the Energy RSA.

Further, all Build Alternatives would address existing transportation problems, such as congestion, lack of system continuity, and existing operational deficiencies; thus, reducing energy consumption within the proposed Project area and complying with all applicable federal, State, and local plans, policies, and regulations listed in Section 2.2.8.1, *Regulatory Setting*. Therefore, none of the Build Alternatives are anticipated to result in permanent indirect adverse impacts on energy.

Table 2.2.8-3. Indirect Energy Use in Energy Resource Study Area

Alternative	Indirect Energy for Facility Maintenance (billion Btu)	Indirect Energy for Vehicle Maintenance (billion Btu)	Total Indirect Energy Use (billion Btu)	Numeric Difference Between Alternatives and Opening Year (2027) No-Build Alternative	Percent Difference Between Alternatives and Opening Year (2027) No-Build Alternative	Numeric Difference Between Alternatives and Design Year (2047) No-Build Alternative	Percent Difference Between Alternatives and Design Year (2047) No-Build Alternative	Numeric Difference Between Alternatives and Horizon Year (2050) No-Build Alternative	Percent Difference Between Alternatives and Horizon Year (2050) No-Build Alternative
Opening Year (2027) No-Build Alternative	21.73	76,595.63	76,617.36	—	—	—	—	—	—
Design Year (2047) No-Build Alternative	21.73	85,712.05	85,733.78	9116.42	11.90%	—	—	—	—
Horizon Year (2050) No-Build Alternative	21.73	87,079.51	87,101.25	10,483.89	13.68%	1,367.46	1.60%	—	—
Opening Year (2027) Alternative 1C	22.88	76,642.44	76,665.31	47.95	0.06%	—	—	—	—
Design Year (2047) Alternative 1C	22.88	85,788.10	85,810.97	9,193.61	12.00%	77.19	0.09%	—	—
Horizon Year (2050) Alternative 1C	22.88	87,159.95	87,182.82	10,565.46	13.79%	*1,449.04*	*1.69%*	81.58	0.09%

Alternative	Indirect Energy for Facility Maintenance (billion Btu)	Indirect Energy for Vehicle Maintenance (billion Btu)	Total Indirect Energy Use (billion Btu)	Numeric Difference Between Alternatives and Opening Year (2027) No-Build Alternative	Percent Difference Between Alternatives and Opening Year (2027) No-Build Alternative	Numeric Difference Between Alternatives and Design Year (2047) No-Build Alternative	Percent Difference Between Alternatives and Design Year (2047) No-Build Alternative	Numeric Difference Between Alternatives and Horizon Year (2050) No-Build Alternative	Percent Difference Between Alternatives and Horizon Year (2050) No-Build Alternative
Opening Year (2027) Alternative 2	22.59	76,638.07	76,660.66	43.30	0.06%	—	—	—	—
Design Year (2047) Alternative 2	22.59	85,774.90	85,797.49	9180.13	11.98%	63.71	0.07%	—	—
Horizon Year (2050) Alternative 2	22.59	87,145.42	87,168.02	10,550.66	13.77%	1,434.23	1.67%	66.77	0.08%
Opening Year (2027) Alternative 3	22.85	76,644.55	76,667.40	50.04	0.07%	—	—	—	—
Design Year (2047) Alternative 3	22.85	85,788.74	85,811.59	9,194.23	12.00%	77.81	0.09%	—	—
Horizon Year (2050) Alternative 3	22.85	87,160.37	87,183.22	10,565.86	13.79%	1,449.43	1.69%	81.97	0.09%
Opening Year (2027) Alternative 5	21.73	76,595.63	76,617.36	0.00	0.00%	—	—	—	—
Design Year (2047) Alternative 5	21.73	85,722.08	85,743.82	9,126.46	11.91%	10.03	0.01%	—	—

Alternative	Indirect Energy for Facility Maintenance (billion Btu)	Indirect Energy for Vehicle Maintenance (billion Btu)	Total Indirect Energy Use (billion Btu)	Numeric Difference Between Alternatives and Opening Year (2027) No-Build Alternative	Percent Difference Between Alternatives and Opening Year (2027) No-Build Alternative	Numeric Difference Between Alternatives and Design Year (2047) No-Build Alternative	Percent Difference Between Alternatives and Design Year (2047) No-Build Alternative	Numeric Difference Between Alternatives and Horizon Year (2050) No-Build Alternative	Percent Difference Between Alternatives and Horizon Year (2050) No-Build Alternative
Horizon Year (2050) Alternative 5	21.73	87,091.05	87,112.78	10,495.42	13.70%	1,379.00	1.61%	11.54	0.01%

Source: (HDR Engineering, Inc., 2023)
Notes: Btu=British Thermal Unit

Total Energy Impacts

The Project under all Build Alternatives would reduce traffic congestion along I-680 and yield energy savings compared to the No-Build Alternative. With the implementation of Measures **E-1** through **E-3**, and the incorporation of the Standardized Project Measure regarding TMP preparation, temporary direct and indirect energy impacts associated with construction would be minimized. Therefore, the Build Alternatives would reduce overall impacts on energy resources. In addition, it is anticipated that the energy expenditure required to construct the Build Alternatives would be partially offset by their long-term operational reductions in energy consumption. Therefore, when balancing energy used during construction and operation against energy saved by relieving congestion and other transportation deficiencies, the Build Alternatives would not result in permanent direct or indirect adverse impacts on total energy.

2.2.8.4 Summary

*Alternative 2 has been selected as the preferred alternative. As discussed above, Alternative 2 would not adversely affect energy. Measures **E-1**, **E-2**, and **E-3** would be implemented to minimize energy impacts from construction activities.*

2.2.8.5 Avoidance, Minimization, and/or Mitigation Measures

E-1 **Greenhouse Gas Reduction Efforts.** During construction, the Project's Resident Engineer will ensure that the following site-specific measure will be implemented where necessary and feasible to avoid or minimize impacts related to construction GHG emissions:

- A program that incentivizes construction workers to carpool and/or use public transit or electric vehicles to commute to and from the Project site will be implemented.

E-2 **Construction Equipment Operation.** Prior to construction, the Project's Resident Engineer will ensure that a list of all off-road equipment greater than 25 horsepower (hp) that would be operated for more than 20 hours over the entire duration of Project construction, including equipment from subcontractors, be submitted to the relevant air district (e.g., Bay Area Air Quality Management District) for review and certification. The list shall include all information necessary to ensure the equipment meets the following requirement:

- Construction equipment shall be zero emissions or have engines that meet or exceed either U.S. Environmental Protection Agency or California Air Resources Board Tier 4 off-road emission standards and shall have engines that are retrofitted with a CARB Level 3 Verified Diesel Emissions Control Strategy (VDECS), if one is available for the equipment being used. Equipment with engines that meet Tier 4

Interim or Tier 4 Final emission standards automatically meet this requirement; therefore, a VDECS would not be required.

- Idling time of diesel-powered construction equipment and trucks shall be limited to no more than two minutes. Clear signage of this idling restriction shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with the manufacturers' specifications.
- Portable diesel generators shall be prohibited. Grid power electricity should be used to provide power at construction sites. Propane and natural gas generators may be used when grid power electricity is not feasible.

E-3 **Emergency Services Management.** Prior to and during construction, the Project's Resident Engineer and CCTA will ensure that the designated contractor will communicate with emergency service providers through the public information program to avoid emergency service delays, by ensuring all providers are aware of lane closures well in advance of implementation. Proactive public information systems, such as changeable message signs, will notify travelers of pending construction activities and new operational activities.

2.3 BIOLOGICAL ENVIRONMENT

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. Natural communities are considered to be of special concern based on (1) federal, state, or local laws regulating their development; (2) limited distributions; and/or (3) the habitat requirements of special-status plants or animals occurring in those habitats. The California Department of Fish and Wildlife (CDFW) maintains a list of natural communities that are provided sensitivity rankings of S1 through S5 and considers those with ranks of S1 through S3 to be sensitive.

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 in Section 2.3.5, *Threatened and Endangered Species*.

Finally, this section includes information on local and state ordinances that the Project must follow with regard to impacts on trees. The California Department of Transportation (Caltrans) follows *Senate Concurrent Resolution No. 17: Oak Woodlands*. Passed in September 1989, this resolution requests State agencies to preserve and protect native oak woodlands and to provide for replacement plantings whenever blue, Engelmann, valley, or coast live oak trees are removed from native woodlands. For the purposes of Senate Concurrent Resolution No. 17, "oak woodlands" means a 5-acre circular area containing five or more oak trees per acre.

Contra Costa County has a tree ordinance protecting certain trees that are adjacent to or part of a riparian, foothill woodland, or oak savanna area, or part of a stand of four or more trees within the unincorporated areas of the county (See Section 816-6.6004 within Title 8 of the *Contra Costa County Zoning Code*). A permit may be required for any trees removed, pruned, or planted within Contra Costa County right-of-way (ROW) or in unincorporated areas of Contra Costa County.

The City of Walnut Creek requires a tree removal permit to remove any tree (dead or alive) within the city limits that is greater than 9 inches in diameter when measured 4.5 feet above the ground (See Section 3-8.03 of the *Walnut Creek Municipal Code*). No specific replacement ratio is provided in either the City of Walnut Creek or Contra Costa County tree ordinances.

Habitat areas that have been designated as critical habitat under the Federal Endangered Species Act 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*.

2.3.1.1 Affected Environment

The following discussion is derived largely from the proposed Project's *Natural Environment Study*, (HDR Engineering, Inc., 2023), which was completed in April 2023. Field surveys for a habitat assessment were performed on February 14 and 27 and August 12, 2020. Field aquatic resource delineations were conducted on August 12, 2020, and June 10, 2021. Tree inventories were conducted on July 29 and August 13, 2021.

The Biological Study Area (BSA) was established to evaluate the Project's effects on natural communities and other biological resources. The BSA is composed of the Project footprint (i.e., the maximum extent of direct temporary and permanent impacts) plus an additional, typically, 50-foot buffer. The BSA also includes areas that could be used for staging, access, tree planting, and mitigation. The BSA totals approximately 908 acres, 777 acres of which are developed areas; paved surfaces of the freeway, on- and off-ramps, and adjacent streets. Since the establishment of the BSA, the Project's design has been refined through coordination among Caltrans, project biologists, and engineers to reduce impacts to the maximum extent. This includes reducing the Project Study Limits from post mile (PM) R4.4/24.5 to PM 10.0/23.2.

The majority of the land cover in the BSA is developed (approximately 86 percent) because the BSA is comprised mostly of State ROW or surface streets. The next largest land cover type is brome grassland (approximately 71 acres; 8 percent of the BSA). The other vegetation communities and land cover types that were identified in the BSA include: arroyo willow thicket, California sagebrush scrub, cattail marsh, common reed marsh, coast live oak woodland, forested lined channel, concrete lined channel, mixed invasive field, non-native woodland, open water, pickleweed mat, saltgrass flat, semi-natural ornamental, unlined modified channel, and valley oak woodland, which are described in more detail below (see Table 2.3.1-1). Approximately 7.28 acres of the BSA were not accessible. All wetland habitats and valley oak woodland identified in the BSA would be considered Natural Communities of Special Concern. Valley oak woodland is the one natural community in the BSA that CDFW considered sensitive on its list of California Sensitive Natural Communities, with a sensitivity ranking of S3.

The northern portion of the BSA is adjacent to Waterbird Regional Preserve – McNabney Marsh, which is part of a 200-acre wetland complex connected by Peyton Slough, which drains into Suisun Bay. The marsh is dominated by tule (*Schoenoplectus acutus*), narrow-leaved cattail (*Typha angustifolia*), and other more halophytic species (i.e., species that grow well in salty soil). Marsh habitat and other potential waters of the United States (U.S.) and/or State occur within the BSA and are considered sensitive by the U.S. Army Corps of Engineers (USACE) and Regional Water Quality Control Board (RWQCB). It is important to note that all marsh habitat mapped in the BSA is situated north of the furthest proposed Project impact area (i.e., PM 23.2). The Project Study Limits were reduced to avoid impacting this marsh habitat.

The BSA is outside the East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan area.

Table 2.3.1-1. Acreage of Vegetation Communities and Land Cover Types Mapped in the BSA

Vegetation Community / Land Cover Type	Acres
Natural Land Cover Types	
Arroyo Willow Thicket	0.21
Brome Grassland	71.08
California Sagebrush Scrub	0.41
California Sagebrush Scrub – disturbed	0.28
Cattail Marsh	2.04
Coast Live Oak Woodland	2.05
Common Reed Marsh	0.76
Mixed Invasive Field	8.62
Mixed Invasive Field – Cattail	3.67
Non-native Woodland	6.86
Open Water	2.90
Pickleweed Mat – degraded	0.13
Saltgrass Flat	0.14
Semi-natural Ornamental	18.12
Valley Oak Woodland	3.30
Artificial Land Cover Types	
Developed	777.04
Forested Lined Channel	1.47
Concrete Lined Channel	1.55
Unlined Modified Channel	0.15
Not Accessible	7.28
TOTAL	***908.06***

Source: (HDR Engineering, Inc., 2023)

Approximately 0.26 acre of other aquatic resources that may fall within USACE, RWQCB, and/or CDFW jurisdiction are situated within or adjacent to proposed impact areas. Most of these aquatic resources were mapped as potential non-jurisdictional features in the Project's Aquatic Resources Delineation Report (HDR Engineering, Inc., 2022). If any areas outside of the BSA are added during final design, those areas would need to be surveyed in order to determine if any additional features would be impacted. Wetlands and other waters are discussed in Section 2.3.2, *Wetlands and Other Waters*.

Description of Upland Vegetation Communities

Brome Grassland

The brome grassland vegetation community occurs across much of the BSA and is dominated by non-native annual grass species. Dominant plant species observed in this habitat include slender oat (*Avena barbata*), ripgut brome (*Bromus diandrus*), foxtail brome (*B. madritensis*), rattail sixweeks grass (*Festuca myuros*), and Italian rye grass (*Festuca perennis*). Other herbaceous plant species that are known to occur in this community include American vetch (*Vicia americana*), geranium (*Geranium* spp.), and bristly ox tongue (*Helminthotheca echioides*).

Many common wildlife species use brome grassland for breeding, foraging, and shelter. Common reptiles that occur in brome grassland include western fence lizard (*Sceloporus occidentalis*), common garter snake (*Thamnophis sirtalis*), and western rattlesnake (*Crotalus oreganus*). Common birds known to nest in brome grassland include western kingbird (*Tyrannus verticalis*), Savannah sparrow (*Passerculus sandwichensis*), and western meadowlark (*Sturnella neglecta*). Brome grassland also provides important foraging habitat for many raptors, including barn owl (*Tyto alba*), American kestrel (*Falco sparverius*), and red-tailed hawk (*Buteo jamaicensis*). Mammals typically found in this habitat include black-tailed jackrabbit (*Lepus californicus*), California ground squirrel (*Otospermophilus beecheyi*), Botta's pocket gopher (*Thomomys bottae*), western harvest mouse (*Reithrodontomys megalotis),* California vole (*Microtus californicus*), and coyote (*Canis latrans*).

California Sagebrush Scrub

The California sagebrush scrub vegetation community in the BSA is restricted to a small area on a hillside just east of I-680 and just south of Rudgear Road (between PM R12.4 and PM R12.6) in the vicinity of Sugarloaf Open Space. Dominant plant species observed in this habitat include California sagebrush (*Artemisia californica*), deerweed (*Acmispon glaber*), and black sage (*Salvia mellifera*), with California sagebrush having the highest cover. The herb layer is comprised of brome grassland habitat. Approximately half the area is bare or disturbed due to erosion.

Many common wildlife species use California sagebrush scrub for breeding, foraging, and shelter. Common reptiles that occur in California sagebrush scrub include western side-blotched lizard (*Uta stansburiana elegans*), western skink (*Plestiodon skiltonianus*), and western yellow-bellied racer (*Coluber constrictor mormon*). Amphibians, such as

Pacific chorus frog (*Pseudacris sierra*) and western toad (*Anaxyrus boreas*), will sometimes use this community outside of the breeding season. Common birds known to nest in California sagebrush scrub include California scrub-jay (*Aphelocoma californica*), wrentit (*Chamaea fasciata*), and rufous-crowned sparrow (*Aimophila ruficeps*). Mammals typically found in this habitat include bobcat *(Lynx rufus*), mule deer (*Odocoileus hemionus*), and brush rabbit (*Sylvilagus bachmani*).

Coast Live Oak Woodland

The coast live oak woodland vegetation community in the BSA is restricted to the hillsides just south of Rudgear Road (between PM R11.7 and PM R12.7). The tree layer is dominated by coast live oak (*Quercus agrifolia*), with a few valley oaks (*Q. lobata*) present also. The shrub layer is absent while the herb layer is dominated by non-native annual grass species found in the brome grassland habitat.

Many common wildlife species use coast live oak woodland for breeding, foraging, and shelter, and many of the same species also use the valley oak woodland community in much the same way. Common reptiles that occur in both coast live and valley oak woodland communities include western fence lizard, southern alligator lizard (*Elgaria multicarinata*), tiger whiptail (*Aspidoscelis tigris*), gophersnake (*Pituophis catenifer*), and common sharp-tailed snake (*Contia tenuis*). Salamanders, including arboreal salamander (*Aneides lugubris*), California slender salamander (*Batrachoseps attenuatus*), and yellow-eyed ensatina (*Ensatina eschscholtzii xanthoptica*), occur in the moist soil under rocks, logs, and leaf litter. Common birds known to nest in coast live and valley oak woodland include California quail (*Calipepla californica*), Nuttall's woodpecker (*Dryobates nuttallii*), oak titmouse (*Baeolophus inornatus*), and western bluebird (*Sialia mexicana*), as well as raptors such as Cooper's hawk (*Accipiter cooperii*), red-shouldered hawk (*Buteo lineatus*), and western screech owl (*Megascops kennicottii*). Mammals found in this habitat typically include mule deer, western gray squirrel (*Sciurus griseus*), and dusky-footed woodrat (*Neotoma fuscipes*). Multiple species of bats, including big brown bat (*Eptesicus fuscus*), hoary bat (*Lasiurus cinereus*), and California myotis (*Myotis californicus*), use coast live oak woodland as foraging and roosting habitat.

Developed

This land cover type occurs throughout the BSA and consists of all areas of urban development. Although mostly a built environment, a large variety of ornamental plantings occurs around residential and commercial buildings, infrastructure, roadway margins, and embankments. Small, wooded areas or fields of non-native species that are surrounded by development are also included in this land cover type.

Developed lands are generally not of high value for wildlife. Birds and mammals that occur in these areas typically include introduced species adapted to human habitation, such as rock pigeon (*Columba livia*), European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), house mouse (*Mus musculus*), and Norway rat (*Rattus norvegicus*). Some native species have adapted to living in developed areas. California

slender salamanders, western toads, and Pacific chorus frogs can occur in irrigated lawns and backyard artificial water features. Birds, such as Brewer's blackbirds (*Euphagus cyanocephalus*), house finches (*Haemorhous mexicanus*), and American crows (*Corvus brachyrhynchos*), nest on buildings or other urban structures, such as traffic lights or transmission towers. Cliff swallows (*Petrochelidon pyrrhonata*), white-throated swifts (*Aeronautes saxatalis*), and some bat species use freeway underpasses, bridges, culverts, and buildings as nest and roost sites.

Mixed Invasive Field

Mixed invasive field is a community type characterized by heavy disturbance and a sparse cover of non-native or weed species including some grasses, but not at a density to be considered a grassland. Some native species can be mixed in with this habitat, but they do not comprise more than 5 percent of the total cover. Non-native plant species identified in this habitat during the field surveys include short-podded mustard (*Hirschfeldia incana*), bristly ox-tongue, geranium, foxtail brome, cultivated radish (*Raphanus sativus*), Italian thistle (*Carduus pycnocephalus*), chickweed (*Stellaria media*), spring vetch (*Vicia sativa*), American vetch, and red-stemmed filaree (*Erodium cicutarium*). This habitat occurs throughout the BSA. In areas along Walnut Creek, this habitat includes some isolated patches of cattail (*Typha* spp.), but its overall cover is less than 5 percent and is not of sufficient density to be classified as its own habitat.

Although comprised mostly of non-native weed species, mixed invasive fields, particularly at edges of natural communities, can provide foraging habitat for many wildlife species, such as western fence lizard, American crow, lesser goldfinch (*Spinus psaltria*), and California ground squirrel.

Non-Native Woodland

This habitat consists of ornamental plantings of non-native trees in areas that are not surrounded by development. Plant species in this habitat include, but are not limited to, red gum (*Eucalyptus camaldulensis*), blue gum (*E. globulus*), Japanese privet (*Ligustrum japonicum*), camphortree (*Cinnamomum camphora*), and Allepo pine (*Pinus halepensis*). Shrub and herb layers are generally poorly developed in this habitat. Understory is usually limited to non-native grasses and other weedy species. This habitat occurs throughout the BSA but especially along the margins of the highways and other developed land.

Although comprised of mostly non-native plant species, non-native woodland can provide foraging habitat for many native wildlife species, such as western fence lizard, Anna's hummingbird (*Calypte anna*), hooded oriole (*Icterus cucullatus*), and western gray squirrel. Raptor species, such as red-tailed hawk and great horned owl (*Bubo virginianus*), will often nest or roost in large, non-native trees, such as blue gum or Australian pine (*Casuarina equisetifolia*).

Semi-Natural Ornamental

Semi-natural ornamental is a community type characterized by various assemblages of native and non-native ornamental plantings and isolated clusters of remnant native species that are not of sufficient density to constitute a natural habitat. Plant species in this habitat can include, but are not limited to, common manzanita (*Arctostaphylos manzanita*), strawberry tree (*Arbutus unedo*), Japanese privet, carrotwood (*Cupanopsis anacardioides*), coyote brush (*Baccharis pilularis*), red gum, toyon (*Heteromeles arbutifolia*), camphortree, and Allepo pine. This habitat occurs throughout the BSA, but especially along the margins of the highways and other developed land. A variety of understory types are present, often including non-native grasses and other weedy species. Despite being comprised of mostly non-native plant species, semi-natural ornamental communities can provide foraging habitat for many native wildlife species.

Valley Oak Woodland

Valley oak woodland is the one natural community in the BSA that CDFW considers sensitive on its list of California Sensitive Natural Communities, with a sensitivity ranking of S3. The valley oak woodland vegetation community in the BSA is restricted to the hillsides just east of I-680 between Stone Valley Road and La Gonda Way (between PM R11.7 and PM R12.7). Valley oak woodland habitat has a very open canopy and an understory comprised of mostly non-native annual grasses, such as brome and slender oats. Many of the common wildlife species that use coast live oak woodland for breeding, foraging, and shelter also use the valley oak woodland community in much the same way.

Description of Aquatic Vegetation Communities

Arroyo Willow Thicket

This habitat is dominated in the tree layer by arroyo willow (*Salix lasiolepis*) and has an understory of various non-native grasses and herb species. This habitat is sparse in the BSA and isolated on slopes adjacent to the highway. These areas do not have the density or acreage required to be considered suitable for special-status species that typically use this habitat, such as willow flycatcher (*Empidonax traillii*) and yellow warbler (*Setophaga petechia*). This habitat occurs near McNabney Marsh (between PM 23.7 and PM 23.8) and near Sugarloaf Open Space (between PM R12.2 and PM R12.3).

Cattail Marsh

This habitat is dominated by cattails in the herb layer, which typically grow so densely that other plant species do not occur. Some patches of common reed (*Phragmites australis*) or salt grass (*Distichlis spicata*) may occur on the margins of this habitat, but these species typically comprise less than 5 percent of the habitat. This habitat occurs in the northern portions of the BSA near Pacheco Creek and McNabney Marsh (from PM 22.2 north to the northern extent of the BSA).

Cattail marshes are among the most productive wildlife habitats in California. Many common species rely on cattail marshes for their entire life cycle. They provide food, cover, and water for a wide variety of bird species, such as great egret (*Ardea alba*), marsh wren (*Cistothorus palustris*), and red-winged blackbird (*Agelaius phoenicius*), as well as mammals, such as North American river otter (*Lontra canadensis*), and amphibians and reptiles, such as Pacific chorus frog and northwestern pond turtle (*Actinemys marmorata*), which is a federally proposed threatened species and California Species of Special Concern.

Common Reed Marsh

This habitat is dominated by common reed in the shrub layer, which typically grows so densely that other plant species do not occur. Some cattail patches may occur on the margins of this habitat, but typically comprise less than 5 percent of the habitat. This habitat occurs at the northern end of the BSA in and near McNabney Marsh (from PM 23.8 north to the northern extent of the BSA). Many of the same wildlife species that occur in cattail marsh also use common reed marsh.

Due to the muted tidal influence in McNabney Marsh, the common reed marsh habitat between PM 23.8 and PM 24.4 in the BSA provides marginal habitat for special-status species that require tidal marsh habitat with a pickleweed component, such as California black rail (*Laterallus jamaicensis coturniculus*), California Ridgway's rail (*Rallus obsoletus obsoletus*), and salt-marsh harvest mouse (*Reithrodontomys raviventris*).

Forested Lined Channel

Forested lined channel is dominated by a random mixture of species in the tree layer. These can include, but are not limited to, red gum, blue gum, coast live oak, Allepo pine, and Italian cypress (*Cupressus sempervirens*). The shrub layer is typically absent, but the occasional Mexican fan palm (*Washingtonia robusta*), English ivy (*Hedera helix*), or cape leadwort (*Plumbago auriculata*) can occur. All of these species are inter-mixed and do not dominate any particular area. This habitat occurs at two locations in the BSA—along Las Trampas Creek (between PM 13.7 and PM 13.8), and along Green Valley Creek (between PM R7.6 and PM R7.7).

Concrete Lined Channel

Concrete lined channel conveys water during storm flows and is generally unvegetated, although occasional patches of invasive herbaceous species were observed. This habitat occurs in the BSA along San Ramon Creek (between PM R12.6 and PM R12.7, PM R11.3 and PM R11.4, PM R10.3 and PM R10.4, and PM R7.4 and PM R7.5) and the Contra Costa Canal (at PM 16.1).

Open Water

Open water is generally an unvegetated area consisting solely of water. However, some small, isolated patches of common reed or cattail can occur in these areas, but not at sufficient size to be classified as their own habitat. Open water in the BSA occurs in McNabney Marsh as well as the main bodies of Walnut Creek and Grayson Creek.

Pickleweed Mat – Degraded

This habitat is comprised of Pacific pickleweed in the herb layer with occasional occurrences of alkali weed (*Cressa truxillensis*). Sometimes saltgrass also occurs in this habitat, particularly along its margin. This habitat is considered to be in degraded form when more than 25 percent of the cover is a mixture of non-native herbaceous species. A small patch of this habitat in its degraded form occurs along Pacheco Creek (between PM 22.2 and PM 22.3).

Saltgrass Flat

This community is dominated by saltgrass in the herb layer with some occasional occurrence of alkali weed or Pacific pickleweed, particularly on the margins. Only a very small sliver of this habitat occurs in the BSA at the northwestern corner of McNabney Marsh near Waterfront Road.

Unlined Modified Channel

Unlined modified channel consists of an artificially created, soft-bottom channel composed of unconsolidated natural material that conveys water during storm flows and has no tree or shrub layer. The herb layer consists of a mixture of non-native herbaceous species. San Ramon Creek at Livorna Road (between PM R11.3 and PM R11.4) is the only location where this habitat occurs within the BSA.

Trees

A tree inventory of the BSA was conducted by a consultant arborist on July 29 and August 13, 2021 (HDR Engineering Inc., 2021). The tree inventory assessed and inventoried all accessible trees in the survey area; documented species, size, and general condition of each tree; assigned unique tree ID numbers; and mapped individual tree locations using a sub-meter accuracy antenna. All trees with a diameter at breast height (dbh) of 4 inches or greater were included in the tree survey. This included both single-stem trees and multi-stem trees with a combined dbh of 4 inches. If a tree was multi-trunked, all trunks with a dbh over 1 inch were measured and recorded. Plants with a growth habit more similar to a shrub than a tree were not mapped as part of this effort. Table 2.3.1-2 provides the results of the tree inventory. The tree inventory identified 257 native trees and 305 non-native trees within the BSA.

Table 2.3.1-2. Tree Inventory Results

Species	Common Name	DBH Range [i] (inches)	Count
NATIVES			
Cercis occidentalis	western redbud	10–16	8
Juglans hindsii	Northern California black walnut	10–43	3
Notholithocarpus sp.	tanoak	11	2
Pinus radiata	Monterey pine	14–44	24
Quercus agrifolia	coast live oak	4–45	65
Quercus chrysolepis	canyon live oak	10–29	15
Quercus kelloggii	California black oak	7–15	18
Quercus lobata	valley oak	6–56	69
Quercus wislizeni	interior live oak	5	1
Salix sp.	willow sp.	5–72	5
Sequoia sempervirens	coast redwood	5–30	47
		Total Count Natives	257
NON-NATIVES			
Acacia melanoxylon	Australian blackwood	6–44	23
Arbutus unedo	strawberry tree	4–30	20
Celtis australis	Mediterranean hackberry	18–28	3
Eucalyptus sp.	eucalyptus sp.	10–66	47
Ficus sp.	fig sp.	6	1
Fraxinus sp.	ash sp.	13	1
Koelreuteria bipinnata	Chinese flame tree	10–27	3
Lagerstroemia indica	crape myrtle	4–12	23
Ligustrum sp.	privet sp.	8–29	10
Liquidambar styraciflua	sweetgum	4–21	31
Olea europaea	olive	10–38	3

Species	Common Name	DBH Range [i] (inches)	Count
Phoenix canariensis	Canary Island date palm	45	1
Pistacia chinensis	Chinese pistache	5–38	23
Pittosporum sp.	mock orange	7–48	6
Prunus sp.	cherry sp.	12	1
Pyrus calleryana	Callery pear	4.5–8.5	12
Schinus molle	Peruvian pepper tree	10–70	17
Triadica sebifera	Chinese tallow	6–20	13
Ulmus parvifolia	Chinese elm	20–37	3
Unknown ornamental	unknown ornamental	4–41	62
Washingtonia robusta	Mexican fan palm	20	2
	Total Count Non-natives		***305***
	Total Count All Trees		***562***

Source: (HDR Engineering Inc., 2021)
[i.] Diameter at breast height (dbh) ranges include sum of multi-stemmed trees

Habitat Connectivity

The San Francisco Bay Area is an important ecological area for the western United States. It is a major stopover point for migrating birds, as well as a migratory route for anadromous fish entering the Sacramento/San Joaquin Delta watershed. Much of the wild, open land within the San Francisco Bay Area has been completely developed or highly disturbed within the last 100 years, making any wild or open land that exists ecologically important to the area. Many rare and endangered species live in small, isolated remnant populations that have been reduced substantially as a result of habitat alteration.

Migration corridors are limited within the BSA due to the high traffic volumes, highway design with sound walls, concrete barriers, retaining walls, and channelized concrete lined creeks. Creek corridors that have not been channelized or culverted below I-680 in the BSA and have an adjacent continuous riparian canopy have some potential to function as terrestrial migration corridors. These creek corridors are associated with Las Trampas Creek, Walnut Creek, Grayson Creek, Pacheco Creek, and Peyton Slough. Due to existing downstream passage barriers, anadromous fish are unable to access the BSA.

2.3.1.2 Environmental Consequences

No-Build Alternative

The No-Build Alternative would maintain the current configurations of I-680 in the BSA. Under the No-Build Alternative, the proposed Project would not be constructed, and no impacts on vegetation, migratory corridors, or fish passage would occur.

Build Alternatives 1C, 2, and 3

Vegetation Communities

Table 2.3.1-3 summarizes the estimated acreage of each land cover type or vegetation community that occurs in the BSA (not including developed areas) and could be directly impacted due to proposed Project construction in the construction footprint for each Build Alternative. Land cover types identified in the BSA that would not be directly impacted by any of the Build Alternatives, because they do not overlap the Project construction footprint, include California sagebrush scrub, cattail marsh, common reed marsh, forested lined channel, mixed invasive field, open water, pickleweed mat, saltgrass flat, unlined modified channel, and valley oak woodland. Under the proposed Project's current design, temporary direct impacts associated with each of the Build Alternatives would be restricted to developed areas. Therefore, temporary impacts to other land cover types and vegetation communities are not discussed.

Table 2.3.1-3. Estimated Areas of Impacts on Land Cover Types – By Alternative

Land Cover Type	Existing Acreage in the BSA				Permanent Impacts (Acre)			
	1C	2 *	3	5	1C	2 *	3	5
Arroyo Willow Thicket	0.21	0.21	0.21	0.21	< 0.01	0.00	< 0.01	0.00
Brome Grassland	71.08	71.08	71.08	71.08	1.55	0.82	1.73	0.37
Coast Live Oak Woodland	2.05	2.05	2.05	2.05	0.16	0.10	0.16	0.00
Concrete Lined Channel	1.55	1.55	1.55	1.55	0.02	0.03	0.07	0.05
Non-Native Woodland	6.86	6.86	6.86	6.86	0.51	0.00	0.51	0.00
Semi-Natural Ornamental	18.12	18.12	18.12	18.12	1.02	0.08	1.02	0.06
Total	**99.87**	**99.87**	**99.87**	**99.87**	**3.26**	**2.53**	**3.49**	**0.48**

Source: (HDR Engineering, Inc., 2023)

Note: * Alternative 2 is the preferred alternative.

With regard to impacts on land cover types, the primary difference between the Build Alternatives is the impact on brome grassland, concrete lined channel, and semi-natural ornamental land cover, as described below—none of which are considered sensitive habitats. Impacts to arroyo willow thicket, coast live oak woodland, and non-native woodland would be the same for Alternatives 1C, 2, and 3. Notably, Alternative 5 would have no impacts on these habitats, and less impact on brome grassland than the other three alternatives. **BIO-GEN-1** through **BIO-GEN-16** are general measures that would be implemented during construction to avoid or minimize impacts to biological resources. In addition, Mitigation Measure **BIO-MM-1** requires the preparation of a Tree Protection Plan and the replacement of, or compensatory mitigation for, any oak tree that would be impacted at a ratio to be determined in consultation with the regulatory agencies during the Plans, Specifications, and Estimates (final design) phase.

Concrete Lined Channel

Alternatives 1C, 2, and 3 include bridge widening over San Ramon Creek between PM R12.6 and PM R12.8, which overlaps 0.02 acre of concrete lined channel. Alternatives 2, 3, and 5 include construction of a new bridge structure over the Contra Costa Canal at PM 16.1, which overlaps 0.05 acre of concrete lined channel. However, construction impacts at both locations are only proposed to occur within the road prism on the elevated roadway spanning San Ramon Creek and the Contra Costa Canal. Therefore, none of the Build Alternatives would disturb the concrete lined channel below these structures.

Semi-Natural Ornamental

All Build Alternatives would include 0.06 acre of impacts to semi-natural ornamental land cover for the construction of a trash capture device near Livorna Road between PM R11.3 and PM R11.4. Alternatives 1C and 3 would also include the realignment of southbound I-680 and the Southbound I-680/Westbound SR-24 Connector at PM 14.3 and PM 14.6, which would result in an additional 0.96 acre of impacts on semi-natural ornamental land cover.

Trees

All trees mapped as part of the tree inventory have the potential to be impacted by the Project due to their proximity to impact areas. Trees rooted in or within 5 feet of the impact areas have a higher potential for damage during construction activities. Any ground disturbance or paving within a tree's critical root zone would be considered a permanent impact to the tree. Minor tree trimming and equipment staging within the critical root zone could result in temporary impacts to trees.

The exact number of trees impacted would depend on the final design as well as the field conditions at the time of construction, such as the geology of the area where cut slopes are excavated, condition of trees, location of supporting roots, and other considerations. Some areas would not be replanted, specifically in areas where there is proposed pavement or structural widening or new structures.

Table 2.3.1-4 provides a summary of potentially impacted trees by alternative (HDR Engineering Inc., 2021). The footprint of Alternative 5 had the least number of total trees mapped and the least number of native trees identified, while the footprint of Alternative 1C had the lowest number of non-native trees identified. The footprint of Alternative 3 had the greatest number of trees mapped because it represents the combined footprints of Alternative 1C and Alternative 2. It should be noted that the tree counts included in the table below do not include inaccessible areas. Those areas would contribute to the overall count; however, inventorying those trees was not possible at the time of survey. Additional surveys and tree counts would be conducted during final design.

Table 2.3.1-4. Potentially Impacted Trees by Alternative

Alternative	Natives	Non-natives	Total
1C	114	117	231
2 *	107	161	268
3	140	169	309
5	65	127	192

Source: (HDR Engineering Inc., 2021)

Note: * Alternative 2 is the preferred alternative.

All Build Alternatives include construction activities outside Caltrans' existing ROW in Walnut Creek. The City of Walnut Creek requires obtaining a tree removal permit for removing any tree (dead or alive) within the city limits that is greater than 9 inches in diameter when measured 4.5 feet above the ground (See Chapter of the *Walnut Creek Municipal Code*). Contra Costa County has a tree ordinance protecting certain trees adjacent to or part of a riparian, foothill woodland, or oak savanna area, or part of a stand of four or more trees within the unincorporated areas of the county (See Section 816-6.6004 within Title 8 of the *Contra Costa County Zoning Code*). A permit may be required for any trees removed, pruned, or planted within Contra Costa County ROW or in unincorporated areas of Contra Costa County. No specific replacement ratio is provided in either the Walnut Creek or Contra Costa County tree ordinances.

Caltrans follows Senate Concurrent Resolution No. 17: Oak Woodlands. Passed in September 1989, this resolution requests State agencies to preserve and protect native oak woodlands and to provide for replacement plantings whenever blue, Engelmann, valley, or coast live oak are removed from native woodlands. Alternatives 1C, 2, and 3 would impact 0.15 acre of coast live oak woodland habitat in the vicinity of Rudgear Road. For the purposes of Senate Concurrent Resolution No. 17, "oak woodlands" means a 5-acre circular area containing five or more oak trees per acre. Although oak trees may be removed as a result of proposed Project activities, none of the oak trees that may be impacted are part of an oak woodland stand as defined in the resolution.

Tree removal would be avoided to the greatest extent practicable. Construction activities for all Build Alternatives are anticipated to avoid the dripline as well as direct removal of trees. In most portions of the BSA, impacts on trees would be primarily associated with trenching for electrical/communication conduits. However, trenches would be narrow, and their location would be adjusted slightly to avoid trees and their driplines whenever possible. The precise number of trees that would need to be removed as a result of construction activities would be determined during final design. Table 2.3.1-4 represents an approximation of the maximum number of trees that have the potential to be impacted during Project construction for each Build Alternative. The trees were mapped in or within 5 feet of the Project footprint. Measure **BIO-GEN-9** would be implemented requiring that construction activities avoid the dripline of, as well as the direct removal of, trees and shrubs to the greatest extent practicable. Mitigation Measure **BIO-MM-1** would be implemented, requiring the compensatory mitigation or replacement of oak trees within the Project Study Limits pending consultation with CDFW.

Migratory Corridors and Habitat Fragmentation

None of the Build Alternatives are anticipated to interfere substantially with wildlife movement between the west and east sides of I-680 or result in habitat fragmentation. The proposed Project would not result in a substantial increase in impermeable surfaces or permanently remove vegetation adjacent to Las Trampas Creek, Walnut Creek, Grayson Creek, Pacheco Creek, or Peyton Slough. Larger culverts that could be used by wildlife to cross under I-680 would not be permanently disturbed.

As shown in Table 2.3.1-1, there would be no temporary impact to any land cover type, other than developed land. Construction activities have the potential to increase nighttime light and glare sources compared to current levels. Areas in the BSA that would be most sensitive to increased lighting and glare over natural conditions would be the marsh habitats and creek corridors, which provide a natural pathway for wildlife. Nighttime illumination is known to adversely affect some species of wildlife in natural areas. It can disturb breeding and foraging behavior and potentially alter breeding cycles of birds, mammals, and nocturnal invertebrates. In addition, light could deter some animal species, especially larger mammals, from using rivers, creeks, and washes as a movement corridor. If uncontrolled, such lighting, where proximal to these movement corridors, could adversely impact the composition and behavior of the wildlife that occur in these areas. This impact is considered potentially substantial. In addition, the noise and vibrations from heavy equipment operation in active construction areas have the potential to affect the movement of wildlife species substantially.

Measures **BIO-GEN-1** through **BIO-GEN-16** would be implemented to avoid or minimize potential construction impacts on wildlife. All Build Alternatives would include a conversion of the existing HOV lane north of SR-242 to an express lane. The northern most extent of impacts associated with all Build Alternatives is PM 23.2, south of McNabney Marsh.

It is expected that diurnal wildlife activities would be temporarily impacted and wildlife from areas immediately surrounding construction would be temporarily displaced. However, because these impacts would be temporary, construction would proceed along the corridor in phases, and specific nighttime work measures would be implemented, impacts to diurnal wildlife activities are expected to be less than substantial. With the implementation of the measures discussed above, the level of impacts to nocturnal wildlife activities due to lighting, glare, construction noise, and equipment vibrations would be minimized.

Fish Passage

Implementing the Build Alternatives would not result in a barrier to fish passage, nor would the Project block or otherwise alter channel flow in any channel where fish may occur.

Build Alternatives 5

Alternative 5 differs greatly from Alternatives 1C, 2, and 3. Alternative 5 would convert existing lanes to an express lane, which would impact fewer acres outside of existing paved areas. Unlike Alternatives 1C, 2, and 3, Alternative 5 would not impact the arroyo willow thicket, coast live oak woodland, or non-native woodland land cover types (see Table 2.3.1-3). Alternative 5 would also result in over 1 acre less impact to brome grassland compared to Alternatives 1C, 2, and 3. As with the other Build Alternatives, construction impacts are only proposed to occur within the road prism on the elevated roadway spanning San Ramon Creek and the Contra Costa Canal. Alternative 5 would not disturb the concrete-lined channel below these structures and would not result in a barrier to fish passage. Alternative 5 would also impact fewer total trees and native trees than the other Build Alternatives (see Table 2.3.1-4). As with Alternatives 1C, 2, and 3, Measures **BIO-GEN-1** through **BIO-GEN-16** would be implemented during construction. Although Alternative 5 would not impact oak woodland, it could impact oak trees. Mitigation Measure **BIO-MM-1** would be implemented requiring the compensatory mitigation or replacement of oak trees within the Project Study Limits pending consultation with CDFW.

2.3.1.3 Summary

*Alternative 2 has been selected as the preferred alternative. As discussed above, Alternative 2 would impact approximately 0.10 acre of coast live oak woodland, approximately 0.82 acre of brome grassland, and approximately 0.08 acre of semi-natural ornamental land cover. Alternative 2 would impact an estimated 268 trees, of which an estimated 161 are native species. Alternative 2 is not anticipated to interfere substantially with wildlife movement or result in habitat fragmentation. Biological resources measures (**BIO-GEN-1** through **BIO-GEN-16**) and Measure **BIO-MM-1** would be implemented. Therefore, impacts on natural communities would not be adverse.*

2.3.1.4 Avoidance, Minimization, and/or Mitigation Measures

Avoidance, minimization, and/or mitigation measures specific to erosion control and stormwater runoff are discussed in Section 2.2.2, *Water Quality and Stormwater Runoff*. Measures specific to wetlands and other waters of the U.S., including creek corridors and marsh habitat, are discussed in Section 2.3.2, *Wetlands and Other Waters*. Measures specific to adverse effects to special status plant and animal species associated with the natural communities of the BSA are discussed in Sections 2.3.3, *Plant Species*; 2.3.4, *Animal Species*; and 2.3.5, *Threatened and Endangered Species*.

The following general avoidance and minimization measures would be implemented for all Build Alternatives during construction. These measures were modified following informal consultation with the U.S. Fish and Wildlife Service (USFWS).

BIO-GEN-1 **USFWS-Approved Biologist.** A USFWS-approved biologist will be present during all vegetation removal, initial ground-disturbing activities, and culvert activities in or adjacent to California red-legged frog (*Rana draytonii*), Alameda whipsnake (*Masticophis lateralis euryxanthus*), and northwestern pond turtle (*Actinemys marmorata*) habitat. Caltrans will submit the names and qualifications of the proposed biological monitor(s) for USFWS approval prior to initiating construction activities. The biologist would be present during work at the following locations:

- PM 22.5 – PM 21.8: Pacheco Boulevard area – between the work limits on the northbound side of I-680 and the habitat associated with Pacheco Creek to the north and east, as well as between the work limits on the southbound side of I-680 and its on-ramp from Pacheco Boulevard and the habitat associated with the unlined channel tributary to Pacheco Creek.
- PM 21.0 – PM 20.9: I-680/SR-4 interchange area – between the work limits on the southbound side of I-680 and its on-ramp from SR-4 and the habitat associated with Grayson Creek to the south.
- PM R19.2 – PM R18.2: Willow Pass Road to Monument Boulevard area – between the work limits on the northbound side of I-680 and the habitat associated with Walnut Creek to the east.
- PM R12.7 – PM R11.3: Rudgear Road to Livorna Road – between the work limits on the southbound side of I-680 and the habitat associated with San Ramon Creek to the west and at the Rudgear Road Undercrossing Bridge.

BIO-GEN-2 **Worker Environmental Training.** All construction personnel will attend a mandatory environmental education program delivered by a USFWS-approved biologist. New personnel will attend a training session before they are allowed to enter the Project site. All personnel will sign a form stating that they completed training and understand all applicable agency regulations and consequences of noncompliance. The contractor will provide translated training material, as needed. Caltrans will keep the forms on file and provide them in the post-construction compliance report. At a minimum, the training will include:

- A description of special-status species that could occur onsite and their habitats, and other sensitive resources.
- A review of applicable conservation measures and how to avoid impacts by implementing them.
- A discussion of applicable agency regulations and consequences of noncompliance.

BIO-GEN-3 **Stop Work Authority.** Through the Project's Resident Engineer, the USFWS-approved biologist will have the authority to stop work to avoid take of listed species, if they determine any permit and authorization requirements are not fully implemented, or unpermitted impacts on sensitive natural resources may occur. If the USFWS-approved biologist(s) exercises this authority, USFWS will be notified by telephone and email within 24 hours. Work will not be allowed to resume without authorization from the USFWS-approved biologist.

BIO-GEN-4 **Preconstruction Surveys for Nesting Birds.** To avoid take of migratory birds during the nesting season (February 1 to September 30), to the extent feasible, vegetation and tree removal will only occur between October 1 and January 31. The qualified biologist will conduct preconstruction nesting bird surveys no more than 72 hours prior to the start of construction. If an active nest is discovered, the biologist will establish an appropriate exclusion buffer around the nest. The buffer will depend on species, an individual's response to disturbance, or the line-of-sight from the construction area to the nest. Equipment and personnel will not enter the buffer until the nest is inactive or juvenile birds are no longer dependent on adults. If a nesting special-status bird species is discovered, Caltrans will coordinate with regulatory agencies for assistance.

BIO-GEN-5 **Caltrans Best Management Practices (Water Pollution Control).** Standard Caltrans Best Management Practices, such as dust

control, spill prevention and control, stockpile management, and other waste management practices as outlined in Section 13-1.01 of the Caltrans Standard Specifications shall be implemented.

The Project will comply with the Construction General Permit issued by the State Water Resources Control Board and with Provisions of the Caltrans Statewide National Pollutant Discharge Elimination System permit. The contractor will prepare and submit a Stormwater Pollution Prevention Plan and Spill Prevention Plan for approval prior to the start of construction. Personnel will adhere to the instructions, protocols, and specifications, outlined in the most current Caltrans *Construction Site Best Management Practices Manual* and Caltrans Standard Specifications. At a minimum, protective measures will include:

- Preventing pollutants generated by vehicle and equipment maintenance or cleaning from entering storm drains or aquatic resources.
- Servicing or storing vehicles and equipment no less than 50 feet from storm drains or aquatic resources unless the features are protected by impermeable barriers.
- Maintaining vehicles and equipment to prevent fluid leaks.
- Storing hazardous materials such as fuels, oils, solvents, etc., in sealed containers at a designated location no less than 50 feet from storm drains or aquatic resources.
- Collecting and disposing of concrete waste and contaminated water from curing in appropriate washouts located no less than 50 feet from storm drains and aquatic resources.
- Capturing or controlling sediment with erosion control devices such as silt fence, fiber rolls, and appropriate erosion control netting, and covering temporary stockpiles.

See also Measures **WQ-1** and **WQ-2**, discussed in Section 2.2.2, *Water Quality and Stormwater Runoff*.

BIO-GEN-6 **Delineation of Environmentally Sensitive Areas (ESA).** ESA will be delineated using high-visibility fencing or alternative delineators. The fencing or delineators will be installed prior to the start of construction and regularly maintained and remain in place until construction is completed. Construction personnel or equipment will not access ESAs unless authorized by the biologist.

BIO-GEN-7 **Prohibition of Monofilament Netting.** To prevent animals from being entangled, trapped or injured, monofilament fiber will not be used in erosion control devices or animal exclusion devices.

BIO-GEN-8 **Prevention of Wildlife Entrapment.** To prevent inadvertent entrapment of wildlife during construction excavated holes or trenches more than 1-foot-deep with walls steeper than 30 degrees would be covered by plywood or similar materials at the close of each working day. Alternatively, one or more escape ramps constructed of earth fill or wooden planks would be installed. Before such holes or trenches are filled, they would be thoroughly inspected for trapped animals.

BIO-GEN-9 **Tree and Shrub Avoidance.** Tree and shrub removal will be avoided unless necessary to complete construction. Construction activities would avoid tree driplines. The following conservation measures will be implemented:

- ESA fencing will be installed at least 1 foot out from the edge of the dripline and completely enclosed buffer.
- The amount of water provided to the tree(s) should not differ from that which was supplied prior to the beginning of construction activities.
- Signs, ropes, cables or other items will not be attached to unremoved trees.
- The following measures will be implemented if any disturbance is necessary within a tree's dripline:
    - If grades must be altered more than plus or minus six inches, an appropriate aeration will be installed, and positive drainage will be maintained.
    - If trenching is unavoidable, the number of trenches will be minimized to the greatest extent practicable. Trees will be trimmed to remove branches proportional to the number of roots lost.
- Limit the amount of excavation and compaction within the root protection zone (equals the dripline radius) to the greatest extent possible.
- No materials should be placed or stored within the root protection zone at any time through the duration of the Project.

Spoils shall not be placed within the tree protection zone either temporarily or permanently. If trees must be removed:

- A certified arborist will mark trees necessary for removal before removal begins.
- Tree pruning or removal would be performed by a certified arborist according to ANSI A300 pruning standards. Trees that need to be removed or pruned should be identified in the preconstruction walk through.

BIO-GEN-10 **Invasive Species Control.** After construction is complete, the contractor will restore disturbed topographical contours to preconstruction conditions. The contractor would contain and remove noxious weeds and associated plant material, and obtain all permits, licenses, and certifications for proper disposal. The contractor would replant disturbed areas with fast-growing native grasses or a native erosion control seed mixture. Where seeding is not practical, the contractor would cover temporarily disturbed areas with black plastic solarization material. The contractor would maintain the material throughout the duration of construction and removed the material at the end of construction.

BIO-GEN-11 **Revegetation Following Construction.** All areas that are temporarily affected during construction shall be revegetated with an assemblage of native grass, shrub, and trees as appropriate. Invasive, exotic plants would be controlled within the Project area to the maximum extent practicable, pursuant to Executive Order 13112.

BIO-GEN-12 **Dust Control.** Dust control measures would consist of regular truck watering of construction access areas and disturbed soil areas with the use of organic soil stabilizers to minimize airborne dust and soil particles generated from graded areas. Regular truck watering would be a requirement of the construction contract. In addition, for disturbed soil areas, an organic tackifier to control dust emissions blowing off of the ROW or out of the construction area during construction would be included in the contract special provisions. Watering guidelines would be established to avoid any excessive run-off that may flow into contiguous areas. Any material stockpiles would be watered, sprayed with tackifier, or covered, to minimize dust production and wind erosion.

BIO-GEN-13 **Minimization of Lighting Impacts.** To the extent practicable, nighttime construction shall be minimized. Approximately 63 days of nightwork are anticipated. Artificial lighting of the Action Area during nighttime hours would be minimized to the maximum extent

practicable and would be directed away from sensitive resources. Artificial lighting would be directed away from vegetated areas and only directed at areas where active construction is occurring. If lighting cannot be directed away from vegetated areas, shielding will be implemented to avoid spillover. Permanent light fixtures would have shielding, light-emitting diodes configured at the minimum necessary number of bulbs, as well as optimal mounting height, mast-arm length, and angle to restrict light to the roadways.

BIO-GEN-14 **Noise Control.** Construction-generated noise associated with the proposed Project will comply with Caltrans Standard Specification 14-8.02 Noise Control.

BIO-GEN-15 **Trash Removal.** All food-related trash items, such as wrappers, cans, bottles, and food scraps, would be disposed of in closed containers and removed at a minimum weekly from the work area.

BIO-GEN-16 **Vehicle Use Compliance.** All personnel working on the proposed Project would be required to comply with guidance governing vehicle use, speed limits on unpaved roads, fire prevention, and other hazards.

The following mitigation measure would be implemented for all Build Alternatives:

BIO-MM-1 **Oak Woodlands.** In accordance with Senate Concurrent Resolution No. 17: Oak Woodlands, native oak woodlands will be avoided to the maximum extent feasible. Any oak trees that are impacted would be mitigated through replacement or compensatory mitigation at a ratio to be determined in consultation with CDFW and based on the size of the tree removed, with large-diameter trees requiring greater replacement numbers than small trees. A Tree Protection Plan will be prepared and implemented to minimize damage to native trees during construction. Precise tree planting locations will be determined during the final design phase and will occur within the Caltrans ROW. Replanted areas will be monitored for success for up to 3 to 10 years and subject to success criteria. The performance criterion for replacement tree plantings is 70 percent survival of all plantings at the end of the monitoring period.

2.3.2 Wetlands and Other Waters

2.3.2.1 Regulatory Setting

Wetlands and other waters are protected under a number of laws and regulations. At the federal level, the Federal Water Pollution Control Act, more commonly referred to as the Clean Water Act (CWA) (33 United States Code [USC] 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 ordinary high water mark (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/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 which 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 U.S. Army Corps of Engineers (USACE) with oversight by the U.S. Environmental Protection Agency (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 Code of Federal Regulations [CFR] Part 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 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 that would have less adverse effects. The Guidelines state that 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.

The Executive Order 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 the Department, 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 proposed project includes all practicable measures to minimize harm. A Wetlands Only Practicable Alternative Finding must be made.

At the state level, wetlands and waters are regulated primarily by the State Water Resources Control Board (SWRCB), the Regional Water Quality Control Boards (RWQCB) and the California Department of Fish and Wildlife (CDFW). In certain circumstances, the Coastal Commission (or Bay Conservation and Development Commission or the Tahoe Regional Planning Agency) may also be involved. Sections 1600-1607 of the California Fish and Game Code 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 USACE jurisdiction 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 (WDR) 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.

2.3.2.2 Affected Environment

The following discussion is from the proposed Project's *Natural Environment Study* (HDR Engineering, Inc., 2023), which was completed in April 2023, and *Aquatic Resources Delineation Report* (HDR Engineering, Inc., 2022). Field aquatic resource delineations were conducted on August 12, 2020, and June 10, 2021.

An aquatic resources delineation has been prepared for all potential wetlands and waters of the U.S. and/or State occurring within the Biological Study Area (BSA), which is described in Section 2.3.1, *Natural Communities*. All areas within the BSA were assessed to the degree necessary to determine the presence or absence of jurisdictional aquatic resources, per the guidelines established by USACE. Much of the delineation effort involved a reverification of previously delineated aquatic resources associated with various other projects overlapping the BSA. Table 2.3.2-1 provides a summary of Section 404 jurisdictional and non-jurisdictional areas within the BSA.

Table 2.3.2-1. Summary of Delineated Jurisdictional Resources

Feature Class	Acreage Jurisdictional	Acreage Non-Jurisdictional
Canal	-	0.12
Ditch	0.02	1.30
Fresh Emergent Wetland	9.50	0.16
Muted Tidal Marsh	0.98	-
Open Water	0.78	-
Perennial Channel	3.74	-
Seep	-	0.07
Total Acreage	**15.03**	**1.64**

Source: (HDR Engineering, Inc., 2023)
Note: Due to rounding, total acreage of non-jurisdictional resources differs slightly from sum of parts.

Aquatic resources mapped during aquatic resources delineations were sorted into feature classes, in accordance with the USACE manual. The USACE manual's classification system for aquatic features differs from descriptions given for the aquatic vegetation communities in Section 2.3.1, *Natural Communities*. The feature classes identified during the delineations are canal, ditch, fresh emergent wetland, muted tidal marsh, open water, perennial channel, and seep.

During the delineations, approximately 15.03 acres of potentially jurisdictional aquatic resources were mapped. In addition, approximately 1.64 acres of non-jurisdictional features were also mapped, including approximately 1.42 acres of canal and ditch and approximately 0.23 acre of non-jurisdictional, isolated wetland features.

Many of the BSA's jurisdictional features were associated with the northern portion of the BSA in the vicinity of McNabney Marsh. This includes a single ditch that is a tributary to the marsh (totals 0.02 acre), freshwater emergent wetlands (9.5 acres), muted tidal marsh (0.95 acre), and open water (0.78 acre).

All streams intersecting the survey area are perennial. Las Trampas, Tice, and San Ramon Creeks originate in the Oakland Hills and Berkeley Hills. San Ramon Creek is also fed by tributaries originating on the western slopes of Mount Diablo, including Green Valley Creek. Tice Creek is a tributary of San Ramon Creek, immediately upstream of the confluence of San Ramon and Las Trampas Creeks. Walnut Creek is created by the confluence of Las Trampas and San Ramon Creeks and flows into the Carquinez Strait, which is the nearest Traditional Navigable Water. All of the channels are cement lined or highly channelized due to the surrounding urban landscape. The survey area contains approximately 3.74 acres of perennial channel.

All wetland and water features identified may also be regulated by the RWQCB as waters of the State through Section 401 of the CWA and/or the State Porter-Cologne Act. All drainages (i.e., forested channels) and drainage features with bed and bank topography may be regulated by Sections 1600 through 1616 of the California Fish and Game Code. The margins of the canal and channels are devoid of continuous canopy or dripline and are mostly hardscaped with discontinuous non-native or landscape trees. The BSA is outside the jurisdiction of the San Francisco Bay Conservation and Development Commission.

The Project Team requested a preliminary jurisdictional determination from USACE as certain features did not appear to meet the definition of waters of the U.S. USACE determined that the provided delineation map depicts the extent and location of wetlands, other waters of the U.S., and navigable waters of the U.S. within the boundary area of the site that may be subject to USACE's regulatory authority under Section 404 of the CWA and Section 10 of the Rivers and Harbors Act via a letter dated September 12, 2024. Refer to Appendix F, *Consultation and Coordination*, for the delineation map and copies of USACE's preliminary jurisdictional delineation.

2.3.2.3 Environmental Consequences

No-Build Alternative

The No-Build Alternative would maintain the current configurations of I-680 in the BSA. Under the No-Build Alternative, the proposed Project would not be constructed, and no impacts on wetlands or other waters would occur.

Build Alternatives (Alternatives 1C, 2, 3, and 5)

Approximately 0.26 acre of aquatic resources, which may fall within USACE, RWQCB, and/or CDFW jurisdiction, are situated within or immediately adjacent to proposed permanent and temporary impact areas. No permanent or temporary impact areas overlap the mapped potential wetlands or waters in the vicinity of McNabney Marsh (north of post mile [PM] 23.1). No coastal wetland resources would be impacted.

The Project's impact areas overlap waterways at two locations: Contra Costa Canal Undercrossing (PM 16.1) and Rudgear Road Undercrossing (i.e., San Ramon Creek [between PM R12.6 and PM R12.7]). For all Build Alternatives, construction impacts would occur primarily on the elevated roadway spanning the waterways at these bridges. None of the Build Alternatives include ground or vegetation disturbance below the OHWM or within CDFW jurisdiction at these locations. Falsework would be installed during construction that would span the waterways and protect debris and contaminants from falling into these waters.

Pavement widening and utility installation overlaps potential wetlands or water at several additional locations within the BSA. For example, all Build Alternatives would install utilities over the Contra Costa Canal between PM 21.8 and PM 21.9. However,

conduit would either span the canal next to existing conduit, or be placed on the highway shoulder, which would avoid impacting this water.

The *Aquatic Resources Delineation Report* also included a mapped wetland or water that crosses I-680 and the Iron Horse Regional Trail (near PM 18.4), which connects to Walnut Creek. All Build Alternatives would include highway widening, soundwall construction, and installation of luminaires, variable toll message signs (VTMS), and other utilities at this location. All Build Alternatives would avoid impacts on this culvert.

The Build Alternatives would have the same permanent BMP areas. BMPs will be determined during final design. Potential BMP locations are described in Section 1.4.1.4, *Permanent Stormwater Treatment*, and shown in Appendix I. Where BMP areas overlap or would be adjacent to potential wetlands or waters, these wetlands or waters would be avoided to the greatest extent practicable.

For linear transportation projects in non-tidal waters, the discharge of dredged or fill material may be able to qualify for Nationwide Permit 14 if it does not result in the loss of greater than 0.5 acre of waters of the U.S. It is anticipated that up to approximately 0.26 acre of jurisdictional wetlands and waters could be permanently impacted by the Project under all Build Alternatives, which would be verified during final design. Caltrans received a preliminary jurisdictional determination from USACE via a letter dated September 12, 2024 (Appendix F, *Consultation and Coordination*). Preliminary jurisdictional determinations are considered to be only advisory in nature and make no definitive conclusions on the jurisdictional status of the water bodies in question. A Section 404 (Nationwide) Permit, Section 401 Water Quality Certification, and/or Section 1602 Streambed Alternation Agreement will be sought during the final design phase for the preferred alternative (i.e., Alternative 2).

No net loss of aquatic resources would be achieved through impact avoidance, minimization, and/or compensatory mitigation. Measure **BIO-MM-2** would be implemented for all Build Alternatives, which would require mitigation for permanent impacts on aquatic resources at a minimum of a 1:1 ratio. Mitigation can be achieved through onsite restoration, in-lieu fee payment, or purchase of mitigation credits at a mitigation bank approved by USACE or RWQCB.

2.3.2.4 Summary

*Alternative 2 has been selected as the preferred alternative. As discussed above, Alternative 2 would impact approximately 0.26 acre of jurisdictional wetlands and waters, which may fall within USACE, RWQCB, and/or CDFW jurisdiction. If during final design, the Project is unable to avoid jurisdictional resources, a Section 404 (Nationwide) Permit from USACE, Section 401 Water Quality Certification from RWQCB, and/or Section 1602 Streambed Alteration Agreement from CDFW will be sought during the final design phase. Mitigation would be determined in consultation with the resource agencies. In accordance with **BIO-MM-2**, mitigation can be achieved through onsite restoration, in-lieu fee payment, or purchase of mitigation credits at a mitigation bank approved by USACE or RWQCB.*

2.3.2.5 Avoidance, Minimization, and/or Mitigation Measures

BIO-MM-2 **Jurisdictional Waters.** Where impact areas overlap or would be adjacent to potential wetlands/waters, these wetlands/waters would be avoided to the greatest extent practicable. The location of permanent BMPs will be refined during final design and wetlands and other waters would be avoided where feasible. Mitigation for any permanent impacts on aquatic resources shall be provided at a minimum of 1:1 ratio, which would be determined in consultation with the permitting agencies during final design. Mitigation can be achieved through onsite restoration, in-lieu fee payment, or purchase of mitigation credits at a mitigation bank approved by USACE or RWQCB. Mitigation as required in regulatory permits issued through USACE and/or the RWQCB may be applied.

2.3.2.6 Wetlands Only Practicable Alternative Finding

As summarized in Section 2.3.2.1, in compliance with EO 11990, Caltrans cannot undertake construction in wetlands unless there are no practicable alternatives to the construction and the proposed project includes all practicable measures to minimize harm.

As discussed in Section 1.4.5.1, *Identification of a Preferred Alternative*, Alternative 2 has been selected as the preferred alternative. The Project Development Team selected Alternative 2 as the preferred alternative because it would provide the most operational benefits on I-680 and would not deteriorate traffic operations on SR-24.

All Build Alternatives would permanently impact up to approximately 0.26 acre of jurisdictional wetlands/waters, which would be verified during final design. To date, the Project design has been refined to avoid and minimize impacts on wetlands to the maximum extent possible. This includes avoiding construction activities within and adjacent to McNabney Marsh and avoiding potential jurisdiction waters within and along the Contra Costa Canal and San Ramon Creek. Measure **BIO-MM-2** would be implemented to ensure wetlands/waters would be avoided to the greatest extent practicable during final design. In addition, mitigation for any permanent impacts on aquatic resources would be provided at a minimum of 1:1 ratio, which would be determined in consultation with the permitting agencies during final design. With implementation of **BIO-MM-2**, the Project would result in no net loss of aquatic resources.

Based on the above considerations, it is determined that there is no practicable alternative to the proposed construction in wetlands and that the proposed action includes all practicable measures to minimize harm to wetlands that may result from such use.

2.3.3 Plant Species

2.3.3.1 Regulatory Setting

The U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (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 the Federal Endangered Species Act (FESA) and/or the California Endangered Species Act (CESA). Please see the *Threatened and Endangered Species*, Section 2.3.5 in this document, for detailed information about these species.

This section of the document discusses all other special-status plant species, including CDFW species of special concern, USFWS candidate species, and California Native Plant Society (CNPS) rare and endangered plants.

The regulatory requirements for FESA can be found at 16 United States Code (USC) Section 1531, et seq. See also 50 Code of Federal Regulations (CFR) Part 402. The regulatory requirements for CESA can be found at California Fish and Game Code, Section 2050, et seq. Department projects are also subject to the Native Plant Protection Act, found at California Fish and Game Code, Section 1900-1913, and the California Environmental Quality Act (CEQA), found at California Public Resources Code, Sections 21000-21177.

2.3.3.2 Affected Environment

The following discussion is derived from the proposed Project's *Natural Environment Study* (HDR Engineering, Inc., 2023), which was completed in April 2023. The Biological Study Area (BSA) is described in Section 2.3.1, *Natural Communities*.

All areas within the BSA were evaluated for suitable habitat to support special-status plant species. The identification of special-status plant species with potential to occur in the region began with a search of the USFWS Information for Planning and Consultation Database, the California Natural Diversity Database (CNDDB), and the CNPS Inventory of Rare, Threatened, and Endangered Plants for the following 7.5-minute quadrangles: Benicia, Vine Hill, Honker Bay, Briones Valley, Walnut Creek, Clayton, Oakland East, Las Trampas Ridge, Diablo, Hayward, and Dublin. These are the quadrangles in which the BSA is situated and that are reached by a 5-mile radius from the BSA. The potential for special-status plants to occur in the BSA was assessed during the February 2020 through August 2021 field surveys. All areas within the BSA were evaluated for suitable habitat to support special-status plants. This review also included the results of field surveys conducted along the BSA for previous projects. The

database searches and initial habitat mapping identified 16 special-status plant species with potential to occur within the BSA (See Table 2.3.3-1).

Table 2.3.3-1. Special-Status Plant Species with Potential to Occur Within the Biological Study Area

Special-Status Plant Species
Johnny-nip (*Castilleja ambigua* var. *ambigua*)
Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*)
Bolander's water-hemlock (*Cicuta maculata* var. *bolanderi*)
Small spikerush (*Eleocharis parvula*)
Mount Diablo buckwheat (*Eriogonum truncatum*)
Jepson's woolly sunflower (*Eriophyllum jepsonii*)
Diablo helianthella (*Helianthella castanea*)
Delta tule pea (*Lathyrus jepsonii* var. *jepsonii*)
Mason's lilaeopsis (*Lilaeopsis masonii*)
Delta mudwort (*Limosella australis*)
Hall's bush-mallow (*Malacothamnus hallii*)
Marin knotweed (*Polygonum marinense*)
Chaparral ragwort (*Senecio aphanactis*)
Long-styled sand-spurrey (*Spergularia macrotheca* var. *longistyla*)
Suisun marsh aster (*Symphyotrichum lentum*)
Saline clover (Trifolium hydrophilum)

Many special-status plant species were eliminated from further consideration due to lack of suitable habitat in the BSA including, but not limited to, woodlands with serpentine soils and alkali soils, vernal pools, and montane coniferous forest to support individuals and/or populations. Of the 16 special-status plant species with potential to occur in the BSA, 15 were determined to not warrant further analysis because they occur in habitats that would not be impacted by the proposed Project. Congdon's tarplant (*Centromadia parryi ssp. congdonii*) is the one special-status plant species with suitable habitat in the BSA that the Project may impact.

2.3.3.3 Environmental Consequences

No-Build Alternative

The No-Build Alternative would maintain the current configurations of I-680 in the BSA. Under the No-Build Alternative, the proposed Project would not be constructed, and no impacts on special-status plant species would occur. Routine maintenance activities along I-680 would be subject to additional environmental review and required to comply with the USFWS and CDFW requirements regarding protected plant species, should those species be identified within areas that would be directly or indirectly affected by such activities.

Build Alternatives (Alternatives 1C, 2, 3, and 5)

The Project would result in the permanent loss of brome grassland habitat that could support special-status plant species, as described in Section 2.3.1, *Natural Communities*. As described therein,

- Alternative 1C would permanently impact approximately 1.55 acres of brome grassland,
- Alternative 2 would permanently impact approximately 0.82 acre of brome grassland,
- Alternative 3 would permanently impact approximately 1.73 acres of brome grassland, and
- Alternative 5 would permanently impact approximately 0.37 acre of brome grassland.

Based on the negative findings during this Project's field surveys, the negative findings during focused rare plant surveys conducted by Caltrans for previous projects within the BSA, and the low quality of suitable habitat within the Project's impact areas, the likelihood for Congdon's tarplant to be present in the BSA is considered moderate.

Measures **BIO-GEN-1** through **BIO-GEN-16**, which are described in Section 2.3.1, *Natural Communities*, would minimize or avoid impacts on special-status plant species, including Congdon's tarplant. In addition, since the Project would impact suitable habitat for Congdon's tarplant, Measure **BIO-PLANTS-1** would be implemented, which would require a preconstruction survey by a qualified biologist. If Congdon's tarplant or any other rare plant is discovered during this survey, the Project biologist would establish a no-work buffer around the discovery for construction activities. Therefore, none of the Build Alternatives would adversely impact special-status plant species.

2.3.3.4 Summary

*Alternative 2 has been selected as the preferred alternative. There is a moderate potential for Congdon's tarplant to be present during construction. General biological resources measures (**BIO-GEN-1** through **BIO-GEN-16**) would be implemented. In accordance with **BIO-PLANTS-1**, should Congdon's tarplant or any other rare plant be identified, it would be mapped and flagged for avoidance. Therefore, there would be no impacts on special-status plant species.*

2.3.3.5 Avoidance, Minimization, and/or Mitigation Measures

In addition to the general biological resources measures provided in Section 2.3.1, *Natural Communities* (**BIO-GEN-1** through **BIO-GEN-16**), the following species-specific avoidance and minimization measure would be implemented:

BIO-PLANTS-1 **Protocol-Level Botanical Surveys.** Protocol-level botanical surveys will be conducted by a qualified biologist in appropriate habitat for Congdon's tarplant (brome grassland) during the appropriate blooming period for the species (May through October). Surveys will be conducted during the two seasons prior to initial ground disturbance. If Congdon's tarplant, or any other rare plants are detected during these surveys, they will be mapped and flagged or fenced off for avoidance. Caltrans will contact CDFW for assistance if necessary.

2.3.4 Animal Species

2.3.4.1 Regulatory Setting

Many state and federal laws regulate impacts to wildlife. The U.S. Fish and Wildlife Service (USFWS), the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries), and the California Department of Fish and Wildlife (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 the federal or state Endangered Species Act. Species listed or proposed for listing as threatened or endangered are discussed in the *Threatened and Endangered Species*, Section 2.3.5, below. All other special-status animal species are discussed here, including CDFW fully protected species and species of special concern, and USFWS or NOAA Fisheries candidate species.

Federal laws and regulations relevant to wildlife include the following:

- National Environmental Policy Act
- Migratory Bird Treaty Act
- Fish and Wildlife Coordination Act

State laws and regulations relevant to wildlife include the following:

- California Environmental Quality Act
- Sections 1600–1603 of the California Fish and Game Code
- Sections 3503 and 3503.5 of the California Fish and Game Code
- Sections 4700, 5050, and 5515 of the California Fish and Game Code
- Special Animals List

2.3.4.2 Affected Environment

The following discussion is derived from the proposed Project's *Natural Environment Study* (HDR Engineering, Inc., 2023), which was completed in April 2023. The Biological Study Area (BSA) is described in Section 2.3.1, *Natural Communities*.

Database searches identified 58 special-status wildlife species that have the potential to occur in the BSA. Of these, 22 special-status wildlife species have the potential to occur in habitats in the BSA that may be impacted by the Project. USFWS and NOAA Fisheries Species Lists are provided in Appendix F, *Consultation and Coordination Documents*.

The following federally listed (proposed, threatened, or endangered) and/or State-listed (candidate, threatened, or endangered) wildlife species have the potential to occur in the BSA:

- Alameda whipsnake (*Masticophis lateralis euryxanthus*)
- California black rail (*Laterallus jamaicensis coturniculus*)
- California red-legged frog (*Rana draytonii*)
- California Ridgway's rail (*Rallus obsoletus obsoletus*)
- Crotch's bumble bee (*Bombus crotchii*)
- Monarch butterfly (*Danaus plexxippus*)
- Northwestern pond turtle (*Actinemys marmorata*)
- Salt marsh harvest mouse (*Reithrodontomys raviventris*)
- Western bumble bee (*Bombus occidentalis*)
- Western burrowing owl (*Athene cunicularia hypugaea*)[1]

These species are discussed further in Section 2.3.5, *Threatened and Endangered Species*.

The remaining special-status wildlife species are discussed below.

American Badger

American badger (*Taxidea taxus*) is a California Species of Special Concern (California Department of Fish and Wildlife, 2025). American badgers occur in open habitats, such as grassland, oak savanna, and coastal scrub, with multiple burrows for shelter and rearing young. Habitat in the BSA was assessed as part of the general wildlife/habitat study. Suitable habitat for American badger is present within the BSA but is extremely limited. Scrub and oak woodland habitat with friable soils and abundant prey resources that occur outside and adjacent to the BSA may provide good habitat for the species. There are no California Natural Diversity Database (CNDDB) occurrences of the species within 5 miles of the BSA. It is not likely that the species would occur in the BSA; however, it is known to occur in Contra Costa County. In addition, grassland habitat with connectivity to California sagebrush scrub and oak woodland is present in

[1] Western burrowing owl was previously identified as a special-status species in the Draft EIR/EA. It was listed as a candidate species under the California Endangered Species Act in October 2024.

the BSA, specifically adjacent to Sugarloaf Open Space (between Livorna and Rudgear Roads from PM R11.3 to PM R12.6).

Bridges' Coast Range Shoulderband

Bridges' coast range shoulderband (*Helminthoglypta nickliniana bridgesi*) is listed on the CDFW Special Animals list but is not a California Species of Special Concern (California Department of Fish and Wildlife, 2025). The Bridges' subspecies of coast range shoulderband is endemic to Alameda and Contra Costa Counties where it inhabits open hillsides, particularly those with open woodlands near creeks, and tends to form colonies under tall grasses and weeds.

Habitat in the BSA was assessed as part of the general wildlife/habitat study. There is one CNDDB occurrence of the snail within 1 mile of the BSA. The single known occurrence is from 2004 and was of a single observed individual. According to satellite imagery, this site has since been graded for a residential development. The brome grassland, coast live oak, valley oak woodland, mixed invasive field, non-native woodland, or semi-natural ornamental areas could provide suitable habitat for this species in the BSA.

Coast Horned Lizard

Coast horned lizard (*Phrynosoma blainvillii*) is a California Species of Special Concern (California Department of Fish and Wildlife, 2025). Coast horned lizards occupy sage scrub, dunes, alluvial scrub, annual grassland, chaparral, oak, riparian, coniferous forest, and saltbush scrub vegetation communities. They require loose, fine soil for burrowing, open areas for basking, and dense foliage for cover. Coast horned lizards are most abundant in the southern California coastal mountains and Sierra Nevada foothills, though they do range along the Coast Range mountains as far north as the Mount Diablo foothills in Contra Costa County.

No coast horned lizards were observed during field surveys. There are no CNDDB occurrences within 5 miles of the BSA. However, the species is known to occur in the Mount Diablo foothills. California sagebrush scrub and coast live oak woodland in the BSA provide marginally suitable habitat for the species. There is potential connectivity between California sagebrush scrub and coast live oak woodland habitat in the BSA between Livorna Road and Rudgear Road (i.e., between PM R11.3 and PM R12.6).

Grassland Nesting Birds

Three special-status bird species that inhabit grasslands have the potential to occur in the BSA: grasshopper sparrow (*Ammodramus savannarum*) and loggerhead shrike (*Lanius ludovicianus*) are both considered California Species of Special Concern, while California horned lark (*Eremophila alpestris actia*) is a state watch list species (California Department of Fish and Wildlife, 2025). All three species were once quite common and widespread throughout much of California, especially the grasslands of the Central Valley, but with much of the landscape converted to agriculture and

development, the species no longer occupy much of their former range. In the Coast Range mountains, these species often occupy grassy hillsides with dense, thatch ground cover comprised of a mix of grasses and forbs and scattered shrubs.

No grasshopper sparrows, loggerhead shrikes, or California horned larks were observed in the BSA during field surveys; however, some suitable habitat for these species is present within the BSA, though it is extremely limited within the Project impact areas. There was one CNDDB occurrence each of grasshopper sparrow, loggerhead shrike, and California horned lark within 5 miles of the BSA. Grassy hillside habitats, especially those in the Sugarloaf Open Space area (between PM R11.4 and PM R12.6), may provide suitable habitat for the species in the BSA.

Nesting Raptors

Nesting raptors are protected under Section 3503.5 of the California Fish and Game Code, which states, "It is unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds-of-prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto." Several raptors, including Cooper's hawk (*Accipiter cooperii*), white-tailed kite (*Elanus leucurus*), and American peregrine falcon (*Falco peregrinus anatum*), have the potential to occur in the BSA.

Cooper's hawk is listed on the CDFW Special Animal List and on CDFW's Watch List (California Department of Fish and Wildlife, 2025). Cooper's hawk is a fairly common and widespread woodland raptor nesting nearly throughout the state, except in the most treeless parts of the Central Valley floor and low deserts. They prefer dense stands of live oaks, riparian zones, and woodland edges where they use cover and make quick bursting flights to ambush their mostly avian prey. One immature Cooper's hawk was observed in the BSA during field surveys.

White-tailed kite is a CDFW fully protected raptor species in California (California Department of Fish and Wildlife, 2025). Species in California with full protection designation have the strongest and most restrictive regulatory protection from take or possession. White-tailed kites nest in oak savanna, oak, and willow riparian vegetation communities, and other open areas with scattered trees near their foraging habitat of open grasslands, meadows, and farmland. They are often seen hover foraging over roadsides or grassy highway medians in pursuit of their prey—mainly small mammals such as voles, mice, and pocket gophers, though birds, reptiles, and insects are sometimes taken. White-tailed kites have the potential to occur in brome grassland, coast live and valley oak woodland, and non-native woodland in the BSA. The nesting period for raptors, including white-tailed kite, occurs generally between February 1 and August 31. Tall, landscaped trees (e.g., gum, oak, pine) within and adjacent to the BSA provide suitable nesting habitat for white-tailed kites. There are no CNDDB occurrences of white-tailed kite within 5 miles of the BSA. However, the BSA is within the species' known range and contains suitable habitat for the species.

American peregrine falcon is a CDFW fully protected raptor species in California (California Department of Fish and Wildlife, 2025). Peregrine falcons were delisted from the Federal Endangered Species Act (FESA) in 1999. Peregrine falcons are often observed making high-speed pursuits of avian prey through canyons or over wetlands, lakes, rivers, or other aquatic habitats. They nest mainly on cliff ledges, though they will often use high, human-made structures, such as bridges, skyscrapers, or electrical towers. Peregrine falcons have the potential to occur foraging in almost any habitat in the BSA. There is only one CNDDB occurrence of peregrine falcon within 5 miles of the BSA. However, the BSA is within the species' known range and contains suitable habitat for the species.

Obscure Bumble Bee

Obscure bumble bee (*Bombus caliginosus*) is listed on the CDFW Special Animals list but is not a California Species of Special Concern (California Department of Fish and Wildlife, 2025). It is primarily a Pacific Coast species, ranging from southern British Columbia to southern California, with a few scattered occurrences along the eastern edge of the Central Valley. They are a medium to long-tongued species, whose food plants include those in the genera *Ceanothus*, *Cirsium*, *Clarkia*, *Keckiella*, *Lathyrus*, *Lotus*, *Lupinus*, *Rhododendron*, *Rubus*, *Trifolium*, and *Vaccinium.* Obscure bumble bees require open grassland or shrubland habitats with abundant flowering plants. They nest primarily underground in small mammal burrows, but sometimes nest above ground in abandoned bird nests. The brome grassland, mixed invasive field, and California sagebrush scrub areas could provide suitable habitat for obscure bumble bees in the BSA.

Roosting Bats

Bats are widespread within California and are found in a variety of habitats. They are nocturnal, aerial predators of insects and other arthropods and often forage over open water, marshes, and other moist, open areas where flying insects tend to congregate. Different bat species will roost in a variety of places, including crevices, caves, mines, buildings, bridges, trees, and snags. Some species are nearly or entirely solitary, while others gather in roosting colonies numbering in the thousands or even millions. During the breeding season (April through September), crevice and cavity roosting species typically gather in groups of mothers and young (maternity colonies) that may number in the thousands or even tens of thousands of individuals.

Bats will also use separate night roosts as temporary resting locations while out on their nightly foraging trips. Night roosts serve the important purpose of giving bats time to digest between foraging sessions, thus reducing the load they must carry in flight. These roosts also appear to have a social function, as males who do not roost with females during the day may be found mixed with females at night roosts (Erickson, et al., 2002). Night roosts require less precise temperature conditions than day roosts and may be located in more open areas, such as overhangs on buildings and open areas on the undersides of bridges.

The following five special-status bat species have the potential to occur foraging, roosting, and/or breeding within the BSA:

- Hoary bat (*Lasiurus cinereus*), Global Rank 3, State Rank 4
- Pallid bat (*Antrozous pallidus*), a California Species of Special Concern
- Townsend's big-eared bat (*Corynorhinus townsendii*), a California Species of Special Concern
- Western red bat (*Lasiurus blossevillii*), a California Species of Special Concern
- Yuma myotis (*Myotis yumanensis*), a federal sensitive species

No focused bat surveys were conducted during the field survey effort for the proposed Project. However, potential roosting trees and structures (e.g., buildings and bridge crossings) were observed within the BSA. During general habitat surveys and in collaboration with other overlapping projects that conducted bat surveys within the alignment, most of the bridges and overpasses in the BSA were found to not provide suitable crevices to support roosting habitat for bats, because they are contiguous slab structures devoid of hinges or joints into which crevice-roosting bats will often find their way. Tree-roosting bat species could use hollows or cavities in large trees, though no such cavities were observed during the surveys conducted for this proposed Project. Nevertheless, all built structures and trees near impact areas should be examined carefully prior to construction for signs of potential bat occupancy.

San Francisco Dusky-Footed Woodrat

San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens)* is a California Species of Special Concern (California Department of Fish and Wildlife, 2025). They are found throughout the San Francisco Bay area in chaparral or wooded areas with evergreen, live oaks, and other thick-leaved trees and shrubs. Woodrats (or packrats as they are often called) build large houses out of sticks. Houses are typically placed on the ground against or straddling a log or exposed roots of a standing tree and are often located in dense brush. Nests are also placed in the crotches and cavities of trees and in hollow logs. Sometimes arboreal nests are constructed, but this behavior seems to be more common in habitat with evergreen and live oak trees.

Habitat in the BSA was assessed as part of the general wildlife/habitat study. Suitable foraging and potential breeding habitat for San Francisco dusky-footed woodrat is present within the BSA but is extremely limited within the proposed Project impact areas. Scrub and oak woodland habitat that occur outside and adjacent to the BSA may provide good habitat for the species. There is only one CNDDB occurrence of the species within 5 miles of the BSA. The species has not been observed in the I-680 alignment surveys conducted for parallel projects.

2.3.4.3 Environmental Consequences

No-Build Alternative

The No-Build Alternative would maintain the current configurations of I-680 in the BSA. Under the No-Build Alternative, the proposed Project would not be constructed, and no impacts on animal species would occur. Routine maintenance activities would be subject to additional environmental review and required to comply with USFWS and CDFW requirements regarding protected wildlife species, should those species be identified within areas that would be directly or indirectly affected by such activities along I-680.

Build Alternatives (Alternatives 1C, 2, 3, and 5)

American Badger

All Build Alternatives would impact up to 1.73 acres of brome grassland. Alternatives 1C, 2, and 3 would impact up to approximately 0.16 acre of coast live oak woodland (see Table 2.3.1-3, *Estimated Areas of Impacts on Land Cover Types – By Alternative*). Alternative 5 would not impact coast live oak woodland. Direct impacts on American badgers could occur within the proposed Project construction areas if an occupied burrow were to be dug up during ground disturbance, an occupied burrow were crushed by construction equipment, construction generated noise were to disturb or disrupt individuals, fugitive dust were to leave the proposed Project construction areas and affect an active burrow, or artificial light from the proposed Project (either from nighttime construction or newly installed permanent lighting) were to disrupt individuals. However, all Build Alternatives would implement the standard measures in Section 1.4.1.6, *Standardized Project Measures*, and the general measures (**BIO-GEN-1** through **BIO-GEN-16**) described in Section 2.3.1, *Natural Communities*, as well as Measure **BIO-BADGER-1**, which would require burrow mapping and avoidance if discovered. Therefore, direct and indirect impacts on the American badger would be minimized or avoided.

Bridges' Coast Range Shoulderband

The Build Alternatives would impact up to 1.73 acres of brome grassland, 0.16 acre of coast live oak woodland, and a combined total of 1.53 acres of non-native woodland and semi-natural ornamental habitats (see Table 2.3.1-3, *Estimated Areas of Impacts on Land Cover Types – By Alternative*), which are potentially suitable habitat for Bridge's coast range shoulderband. Alternative 5 would not impact coast live oak woodland. Direct impacts on Bridges' coast range shoulderband could occur within the proposed Project construction areas as a result of being crushed by construction equipment or if fugitive dust from construction activities were to encroach on suitable habitat outside the construction areas. However, all Build Alternatives would implement the standard measures in Section 1.4.1.6, *Standardized Project Measures*, and the general measures (**BIO-GEN-1** through **BIO-GEN-16**) described in Section 2.3.1, *Natural Communities*, as well as Measure **BIO-SNAIL-1**, which would require

preconstruction surveys. Therefore, direct and indirect impacts on the Bridge's coast range shoulderband would be minimized or avoided.

Coast Horned Lizard

Alternatives 1C, 2, and 3 would impact up to approximately 0.16 acre of coast live oak woodland (see Table 2.3.1-3, *Estimated Areas of Impacts on Land Cover Types – By Alternative*) that is potentially suitable habitat for coast horned lizard. Alternative 5 would not impact coast live oak woodland. Direct impacts on coast horned lizard could occur within the proposed Project construction areas as a result of being crushed by construction equipment or trapped in open excavations, or if fugitive dust from construction activities or artificial lighting from the proposed Project were to encroach on suitable habitat outside the construction areas. However, all Build Alternatives would implement the standard measures in in Section 1.4.1.6, *Standardized Project Measures*, and the general measures (**BIO-GEN-1** through **BIO-GEN-16**) described in Section 2.3.1, *Natural Communities*. Alternatives 1C, 2, and 3 would implement Measure **BIO-LIZARD-1**, which would require preconstruction surveys for coast horned lizard. Therefore, direct and indirect impacts on the coast horned lizard would be minimized or avoided.

Nesting Raptors and other Nesting Birds

Project-related activities have the potential to impact nesting raptors and their habitat permanently. Construction activities, such as vegetation clearing and removal and other project-related ground disturbances or equipment operation, could affect nesting in vegetation in or adjacent to work areas. Tree removal could result in a direct loss of active nest sites if nests are present. Project construction activities, particularly noise and vibration, could also result in temporary disturbances to active nests or individuals foraging in areas near the BSA that could cause individuals to avoid using adjacent areas or cause nests to be abandoned.

All Build Alternatives would implement the standard measures in Section 1.4.1.6, *Standardized Project Measures*, and the general measures (**BIO-GEN-1** through **BIO-GEN-16**) described in Section 2.3.1, *Natural Communities*. Preconstruction surveys would also be conducted for Cooper's hawk, white-tailed kite, and peregrine falcon in accordance with Measures **BIO-HAWK-1**, **BIO-KITE-1**, and **BIO-FALCON-1**.

To further confirm Project-related construction activities do not result in an MBTA violation and Sections 3503, 3503.5, and 3513 of the Fish and Game Code, Measure **BIO-GEN-4** would be implemented, requiring work activities, including tree removal, tree trimming, operation of heavy machinery, pile driving, jackhammering, blasting, and elevated work, to be completed outside nesting bird season (February 1 through August 31), if possible. If work cannot be completed outside this time, a qualified biologist would conduct preconstruction nesting surveys. If an active nest or dead or injured bird is discovered, all work would stop within 100 feet of the discovery, according to Caltrans *Standard Specifications*, and a biologist would assess the discovery. The biologist would then establish an appropriately sized buffer around the discovery, which would be

no less than 50 feet for most bird nests; 75 feet for grasshopper sparrow, loggerhead shrike, or California horned lark nests; 300 feet for a Cooper's hawk or white-tailed kite nest; and 500 feet for a peregrine falcon nest. The buffer would remain in place until the nest is no longer active or the young have left the area or are no longer dependent on adults. Therefore, direct and indirect impacts on nesting birds would be minimized or avoided.

Obscure Bumble Bee

All Build Alternatives would permanently impact up to 1.73 acres of brome grassland, which is potentially suitable habitat for obscure bumble bee (see Table 2.3.1-3, *Estimated Areas of Impacts on Land Cover Types – By Alternative*). Potential direct impacts on this bumble bee species, should it be present, include removal of nests or foraging plants, loss of nest habitat, or direct mortality during ground disturbance. Indirect impacts could include changes in foraging behavior, nest abandonment or reduced nest success as a result of increased noise or artificial light, or fugitive dust encroaching on suitable habitat beyond proposed Project construction areas resulting in detrimental impacts on nectar sources. However, all Build Alternatives would implement the standard measures in Section 1.4.1.6, *Standardized Project Measures*, and the general measures (**BIO-GEN-1** through **BIO-GEN-16**) described in Section 2.3.1, *Natural Communities*, as well as **BIO-BEE-1**, which would require a preconstruction bumble bee nest survey. This measure also applies to the candidate listed Crotch's and western bumble bees (see Section 2.3.5, *Threatened and Endangered Species*). Therefore, direct and indirect impacts on bumble bee species as a result of the disturbance associated with the proposed Project would be unlikely.

Roosting Bats

Most of the bridges and overpasses in the BSA do not provide suitable crevices to support roosting habitat for bats. There is potential that special-status bats could occupy suitable habitat in trees that could be removed during construction. Direct impacts on roosting bats from tree removal or through disruption of roosting sites from construction noise or lighting could occur. However, all Build Alternatives would implement the standard measures in Section 1.4.1.6, *Standardized Project Measures*, and the general measures (**BIO-GEN-1** through **BIO-GEN-16**) described in Section 2.3.1, *Natural Communities*, as well as Measures **BIO-BAT-1** and **BIO-BAT-2**, which would require preconstruction surveys and avoidance of roosts, if found. Therefore, direct and indirect impacts on roosting bats would be minimized or avoided.

San Francisco Dusky-Footed Woodrat

Most of the Project's impact areas constitute developed or ruderal habitats consisting of paved roadways and shoulders, gravel shoulders, bare ground, and ruderal vegetation, which do not provide suitable habitat for San Francisco dusky-footed woodrat. Alternatives 1C, 2, and 3 would impact up to approximately 0.16 acre of coast live oak woodland (see Table 2.3.1-3, *Estimated Areas of Impacts on Land Cover Types – By Alternative*), which is potentially suitable habitat for the San Francisco dusky-footed

woodrat. Alternative 5 would not impact coast live oak woodland. Direct impacts could occur if a woodrat nest were to be present in trees or brush that were removed during clearing and grubbing or if fugitive dust from construction activities or artificial lighting from the proposed Project were to encroach on suitable woodrat habitat outside the construction areas. However, all Build Alternatives would implement the standard measures in Section 1.4.1.6, *Standardized Project Measures*, and the general measures (**BIO-GEN-1** through **BIO-GEN-16**) described in Section 2.3.1, *Natural Communities*, as well as Measures **BIO-WOODRAT-1** and **BIO-WOODRAT-2**, which would require preconstruction surveys and nest relocations if a woodrat nest is discovered, respectively. Therefore, direct and indirect impacts on San Francisco dusky-footed woodrat would be minimized or avoided.

2.3.4.4 Summary

*Alternative 2 has been selected as the preferred alternative. Alternative 2 has the potential to affect habitat for the following special-status animal species: American badger, Bridges' coast range shoulderband, coast horned lizard, obscure bumble bee, San Francisco dusky-footed woodrat, roosting bats, and nesting raptors and other nesting birds. General measures (**BIO-GEN-1** through **BIO-GEN-16**) and Measures **BIO-BADGER-1**, **BIO-BAT-1**, **BIO-BAT-2**, **BIO-BEE-1**, **BIO-FALCON-1**, **BIO-KITE-1**, **BIO-HAWK-1**, **BIO-LIZARD-1**, **BIO-OWL-1**, **BIO-SNAIL-1**, **BIO-WOODRAT-1**, and **BIO-WOODRAT-2** would be sufficient to minimize or avoid impacting animal species. Therefore, impacts would not be adverse.*

2.3.4.5 Avoidance, Minimization, and/or Mitigation Measures

In addition to the general measures provided in Section 2.3.1, *Natural Communities*, the following species-specific avoidance and minimization measures would be implemented:

BIO-BADGER-1 **American Badger Preconstruction Burrow Mapping and Avoidance.** While carrying out protocol burrowing owl surveys (**BIO-OWL-1**), mapping of all mammal burrows will be conducted within suitable habitat up to 500 meters of proposed Project impact areas (if accessible). During these surveys, any American badger burrows in the survey area will be mapped. Any American badger burrows identified during these surveys will be avoided by a minimum of 200 feet (occupied by adult badgers), and 500 feet if it is found to be a natal burrow (badger young present). Caltrans will contact CDFW for assistance if American badger dens are discovered.

BIO-BAT-1 **Bats Preconstruction Surveys.** A Caltrans-approved bat biologist will conduct preconstruction bat surveys no more than 3 days prior to the start of construction. If an active maternity roost is discovered, the biologist will establish an appropriate buffer around

the roosts. Caltrans will contact CDFW for assistance if roosting bats or evidence of roosting are observed.

BIO-BAT-2 **Bat Roost Avoidance.** If bats are detected roosting within a bridge structure within 250 feet of disturbance, lighting will be directed away from the roosts, and combustion equipment and vehicles will not be parked or operated under the bridge or structure. If a roost is discovered in a structure or tree that is to be removed, then an appropriate exclusion method will be implemented in coordination with a qualified bat biologist.

BIO-BEE-1 **Bumble Bee Preconstruction Nest Survey.** A biologist will conduct a preconstruction bumble bee nest survey prior to any ground disturbance associated with the proposed Project in brome grassland, semi-natural ornamental, or non-native woodland habitat. If a bumble bee nest is discovered in or within 50 feet of any disturbance area during the preconstruction survey, then the nest will be mapped, flagged, and avoided.

BIO-FALCON-1 **Peregrine Falcon Preconstruction Survey.** If an active peregrine falcon nest is discovered, a qualified biologist will establish an appropriately sized buffer (no less than 500 feet) around it. The buffer will remain in place until the qualified biologist determines that the nest is no longer active, or the young have left the area or are no longer dependent on adults. Caltrans will contact CDFW for assistance if necessary.

BIO-KITE-1 **White-tailed Kite Preconstruction Surveys.** If an active white-tailed kite nest is discovered, a qualified biologist will establish an appropriately sized buffer (no less than 300 feet) around it. The buffer will remain in place until the qualified biologist determines that the nest is no longer active, or the young have left the area or are no longer dependent on adults. Caltrans will contact CDFW for assistance if necessary.

BIO-HAWK-1 **Cooper's Hawk Nest Buffer.** If an active Cooper's hawk nest is discovered, a qualified biologist will establish an appropriately sized buffer (no less than 300 feet) around it. The buffer will remain in place until the qualified biologist determines that the nest is no longer active, or the young have left the area or are no longer dependent on adults. If necessary, Caltrans will contact CDFW for assistance if a Cooper's hawk nest is discovered.

BIO-LIZARD-1 **Coast Horned Lizard Preconstruction Surveys.** A biologist will conduct a preconstruction survey prior to any ground disturbance to ensure coast horned lizards are absent in proposed Project impact

areas between Livorna Road and Rudgear Road (PM R11.3 and PM R12.6).

BIO-SNAIL-1 **Bridges' Coast Range Shoulderband Preconstruction Surveys.** A biologist will conduct a preconstruction survey for shoulderband snails prior to any ground disturbance in brome grassland, coast live oak woodland, mixed invasive field, non-native woodland, or semi-natural ornamental habitats. If a shoulderband snail colony is discovered in any disturbance area during the preconstruction survey during the preconstruction survey, then it will be mapped, flagged, and avoided.

BIO-WOODRAT-1 **San Francisco Dusky-Footed Woodrat Preconstruction Survey.** Prior to clearing of any vegetation in the proposed Project impact areas or within 50 feet of ground disturbing activities, a qualified biologist shall conduct a survey for San Francisco dusky-footed woodrat nests. If San Francisco dusky-footed woodrat nests are located, an exclusion buffer of at least 50 feet from these nests will be established to avoid disturbing the nests.

BIO-WOODRAT-2 **San Francisco Dusky-Footed Woodrat Nest Translocation.** Nest relocation will only occur if necessary and performed by a permitted biologist. Caltrans will contact CDFW if it is necessary to relocate a nest.

2.3.5 Threatened and Endangered Species

2.3.5.1 Regulatory Setting

The primary federal law protecting threatened and endangered species is the Federal Endangered Species Act (FESA): 16 United States Code (USC) Section 1531, et seq. See also 50 Code of Federal Regulations (CFR) Part 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 Federal Highway Administration (FHWA) (and the Department, as assigned), are required to consult with the U.S. Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries) 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, the California Endangered Species Act (CESA), California Fish and Game Code 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. The California Department of Fish and Wildlife (CDFW) is the agency responsible for implementing CESA. Section 2080 of the California Fish and Game Code prohibits "take" of any species determined to be an endangered species or a threatened species. Take is defined in Section 86 of the California Fish and Game Code 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 California Fish and Game Code.

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 United States, 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.

2.3.5.2 Affected Environment

The following discussion is derived from the proposed Project's *Natural Environment Study* (HDR Engineering, Inc., 2023), which was completed in April 2023, and *Biological Assessment* (California Department of Transportation, 2025), which was completed following the selection of the preferred alternative. The Biological Study Area (BSA) is described in Section 2.3.1, *Natural Communities*.

The identification of threatened or endangered animal species with the potential to occur in the region was based on a search of the USFWS Species List Databases and the California Natural Diversity Database (CNDDB) for the 11 U.S. Geological Survey (USGS) quadrangles surrounding the BSA, as well as field reconnaissance surveys, habitat assessments, and the aquatic resource delineation survey completed for the Project. An official list of federally listed (or candidate) species potentially occurring in the proposed Project vicinity was requested from the USFWS Information for Planning and Consultation (IPaC) system in March 2020, and updated official lists were requested in March 2024, April 2025, and September 2025, the latter of which is included in Appendix F, *Consultation and Coordination Documents*.

Pursuant to Section 7 of the FESA, a Biological Assessment has been prepared for the Project (California Department of Transportation, 2025). Section 402.02 of Title 50 of the Code of Federal Regulations (CFR) requires the identification of an "action area" (AA) for FESA consultation (i.e., all areas to be affected directly or indirectly by the action). In coordination with USFWS, the AA was defined as 500 feet from the limits of disturbance for Alternative 2 following selection of the preferred alternative.

The majority of the land cover in the AA is developed. Most of the footprint within the Caltrans ROW or surface streets is developed. The other vegetation communities and land cover types identified in the AA include the following: brome grassland, California sagebrush scrub, cattail marsh, coast live oak woodland, ephemeral pond, forested-lined channel, concrete-lined channel, mixed invasive field, non-native woodland, open water, seminatural ornamental, and unlined modified channel. A summary of the acreage of vegetation communities and land cover types mapped in the AA is provided in Table 2.3.5-1.

A total of 8 federally listed plant species and 23 federally listed, proposed, or candidate wildlife species were initially identified as having the potential to occur in the BSA. Following field reviews, which included habitat assessment, aquatic resources delineation, and tree inventory, as well as reviews of previously prepared documents and Letters of Concurrence from USFWS for earlier projects along the Project's alignment, all 8 federally listed plant species and 16 of the federally listed or proposed wildlife species were determined to have no potential to occur in the AA based on factors including current known range, local extirpation, and lack of suitable habitat. Therefore, "No Effect" determinations were reached for these species.

Table 2.3.5-1. Acreage of Vegetation Communities and Land Cover Types Mapped in the Action Area

Vegetation Community / Land Cover Type	Acres
I-680	
Natural Land Cover Types	
Brome Grassland	120.16
California Sagebrush Scrub	1.11
Cattail Marsh	3.31
Coast Live Oak Woodland	8.68
Ephemeral Pond	0.25
Mixed Invasive Field	44.77
Non-native Woodland	0.48
Open Water	5.65
Seminatural Ornamental	49.70
Artificial Land Cover Types	
Developed	1,291.46
Forested Lined Channel	8.38
Concrete Lined Channel	3.13
Unlined Modified Channel	12.36
TOTAL	**1,549.44**

As discussed previously in Section 2.3.4, *Animal Species*, the following FESA-listed species (proposed, threatened, or endangered) and CESA-listed species (candidate, threatened, or endangered) have the potential to occur within the BSA:

- Crotch's bumble bee (*Bombus crotchii*) – CESA candidate
- Western bumble bee (*Bombus occidentalis*) – CESA candidate
- California red-legged frog (*Rana draytonii*) – FESA threatened
- Alameda whipsnake (*Masticophis lateralis euryxanthus*) – FESA and CESA threatened
- Monarch butterfly (*Danaus plexippus*) – FESA proposed
- Northwestern pond turtle (*Actinemys marmorata*) – FESA proposed

- Western burrowing owl (*Athene cunicularia hypugaea*) – CESA candidate[1]
- California black rail (*Laterallus jamaicensis coturniculus*) – CESA threatened
- California Ridgway's rail (*Rallus obsoletus obsoletus*) – FESA and CESA endangered
- Salt marsh harvest mouse (*Reithrodontomys raviventris*) – FESA and CESA endangered

Crotch's Bumble Bee and Western Bumble Bee

Crotch's bumble bee and western bumble bee have the potential to occur in the BSA based on the presence of suitable habitat and historical occurrences in the BSA. Crotch's and western bumble bee were advanced as candidates for listing as endangered by the California Fish and Game Commission in 2019. The listing process was then paused while legal proceedings took place to establish whether insects could in fact be listed under CESA. In September 2022, the California Supreme Court upheld the 2019 decision to advance the bumble bees as candidates for listing, reinitiating the candidate period for these species.

Crotch's bumble bees are nearly endemic to California and once occupied grassland and shrubland habitat across California's Central Valley, the coast ranges, and the southern California mountains. Since the late 20th Century, the species has experienced severe declines and a retraction of its range and is now thought to be extirpated from the Central Valley. Western bumble bees were once common and widespread throughout the western U.S., but they too have experienced a dramatic decline and are no longer present in much of their former range. While there are several CNDDB occurrences of western bumble bee and one occurrence of Crotch's bumble bee within 5 miles of the BSA, none of these occurrences are more recent than the 1970s.

Bumble bees are important pollinators and require open grassland or shrubland habitats with abundant flowering plants. They nest primarily underground, requiring abandoned small mammal burrows as nest sites, though western bumble bees have also been observed using above-ground sites, such as brush piles, logs, or stacked railroad ties (Williams, 2014). Nesting season for both species is from February through October. Crotch's bumble bee is a short-tongued species and is therefore reliant on open flowers with short corollas, such as those in the genera *Asclepias*, *Chaenactis*, *Lupinus*, *Medicago*, *Phacelia*, and *Salvia*. Western bumble bees are more general about the types of flowers they visit and can often be found in more developed areas with abundant flowering plants, such as parks and gardens.

[1] The western burrowing owl was previously identified as a special-status species in the Draft EIR/EA. It was listed as a candidate species under CESA in October 2024.

Crotch's bumble bee and western bumble bee have the potential to occur in the BSA based on presence of suitable habitat and historical occurrences in the BSA. Suitable habitat for these species within the BSA includes areas mapped as brome grassland, mixed invasive field, live oak woodland, and semi-natural ornamental. Focused surveys for bumble bees have not been conducted to date for the Project.

Monarch Butterfly

Monarch butterfly is a widespread but rapidly declining North American butterfly species with a population that spends the winter (i.e., overwinters) on the Pacific coast from just north of the San Francisco Bay Area south to Baja California (United States Fish and Wildlife Service, 2020a). Monarchs were advanced as a candidate for federal listing by USFWS in 2020. Listing was found to be warranted but precluded by higher priority listing actions at that time. In July 2022, the International Union of Conservation of Nature placed monarchs on their Red List as endangered. USFWS proposed to list the monarch butterfly as a threatened species and designate critical habitat in December 2024. The project does not overlap proposed critical habitat.

Monarchs are a prolifically migratory butterfly species, breeding across much of North America and journeying south to wintering grounds on the California coast and as far south as southern Mexico. They are important pollinators to a diversity of blooming nectar resources on their breeding grounds and across their migration routes. Their host plant is milkweed (*Asclepias* sp.), which they depend on for oviposition and subsequent larval feeding (United States Fish and Wildlife Service, 2020a).

Migratory monarchs in western North America overwinter primarily in groves of large trees along the coast of California and Baja California. The location and structure of these groves provide the specific microclimate needed for survival in their overwintering areas. These groves are most commonly composed of blue gum (*Eucalyptus globulus*), Monterey pine (*Pinus radiata*), and Monterey cypress (*Hesperocyparis macrocarpa*) roost trees. These groves provide indirect sunlight, sources of moisture for hydration, defense against freezing temperatures, and protection against strong winds (United States Fish and Wildlife Service, 2020a).

There are no known monarch overwintering areas in the BSA, with the nearest occurrence in CNDDB being approximately 7 miles to the northwest between the Carquinez Bridge and Mare Island where the frequent coastal fog provides more suitable conditions for overwintering. However, monarchs are known to occur in the BSA during breeding and migration periods, and while no milkweed was observed during the field surveys, there was at least one recent observation of milkweed near the BSA at Sugarloaf Open Space (Xerces, 2023).

California Red-Legged Frog

California red-legged frogs are a federally threatened amphibian species and a California Species of Special Concern (California Department of Fish and Wildlife, 2025). Critical habitat for California red-legged frogs was designated by USFWS in April

2006 and revised in March 2010 (United States Fish and Wildlife Service, 2010a). The closest designated critical habitat for this species is 9 miles from the BSA, and the closest proposed critical habitat units are approximately 2 miles from the BSA.

California red-legged frog habitat consists of the following:

- *Aquatic Breeding Habitat*. This habitat includes natural or artificial, ephemeral or permanent standing bodies of fresh water, slow-moving streams, or pools within streams that can sustain all the species' aquatic life stages. These areas must hold water for at least 20 weeks during the year, which is the minimum amount of time needed for breeding and tadpole development and metamorphosis (United States Fish and Wildlife Service, 2010a). It is also critical that aquatic breeding habitat for the species be free of predatory bullfrogs, or at least provide sufficient vegetative cover as protection from predation. Ephemeral aquatic features often prove to be better breeding habitat for California red-legged frogs because the drying period helps to prevent establishment of bullfrog populations.

- *Non-Breeding Aquatic Habitat*. This habitat includes springs, seeps, moist cracks within dried ponds, and vegetated areas growing within the floodplains of rivers and streams. These areas do not hold enough water for California red-legged frog breeding but provide cover and space needed for foraging and dispersal to other breeding habitats. They are particularly important during drought periods (United States Fish and Wildlife Service, 2010a).

- *Upland Habitat*. This habitat consists of areas where California red-legged frogs can seek shelter, such as under boulders, rocks, animal burrows, fallen logs, and agricultural debris, such as watering troughs and haystacks. Upland habitats are also important because they buffer aquatic habitats from degradation and provide space for foraging, sheltering, and avoiding predation (United States Fish and Wildlife Service, 2010a).

- *Dispersal Habitat*. This habitat includes migration corridors that allow the frogs to disperse overland to and from breeding sites, sometimes as far as 1.5 miles apart. Dispersal habitat can take many forms. A riparian woodland corridor between aquatic breeding habitat and upland refugia provides a more obvious dispersal opportunity; however, in some areas California red-legged frogs may make use of pastures, concrete-lined channels, or other less natural habitats for dispersal.

According to CNDDB, there are 13 occurrences of California red-legged frogs within 5 miles of the BSA. This includes a tributary to San Ramon Creek that is upstream of the BSA. Within the BSA, San Ramon Creek is shallow and concrete-lined with only sparse vegetation and crosses under the Rudgear Road Undercrossing Bridge. This segment of San Ramon Creek could be potential dispersal habitat for California red-legged frogs but would not be suitable breeding habitat for the species. No CNDDB

occurrences have been documented in Las Trampas Creek or from the main body of Walnut Creek to Suisun Bay.

The land surrounding the BSA is almost entirely urban, consisting of residential and commercial development. The Contra Costa Canal and other creeks that cross I-680 could serve as potential dispersal habitat for California-red legged frogs. These creeks could provide artificial shelters for the species in the form of culverts, pipe outlets, and debris. However, the lack of suitable habitat within the BSA, the amount of urban development and human activity surrounding the BSA, and the distance and isolation of the BSA from areas of suitable habitat where California red-legged frogs are known to occur make it highly unlikely that this species would occur within the BSA.

Alameda Whipsnake

The Alameda whipsnake is a federally and State-listed threatened species (California Department of Fish and Wildlife, 2025). USFWS published a final rule on October 2, 2006, designating critical habitat for the species (71 Federal Register 58175). The nearest critical habitat unit for this species is approximately 0.5 mile west of I-680 near Livorna Road.

Alameda whipsnakes are typically found in chaparral—northern coastal sage scrub and coastal sage. Recent telemetry data indicate that, although Alameda whipsnake home ranges are centered on shrub communities, they commonly venture up to 500 feet, and sometimes as far as 4 miles, into adjacent habitats, including grassland, oak savanna, and occasionally oak-bay woodland (United States Fish and Wildlife Service, 2020b). Rock outcrops provide important retreat opportunities for Alameda whipsnake.

Adult Alameda whipsnakes appear to have a bimodal seasonal activity pattern with a large peak during the spring mating season and a smaller peak during late summer and early fall. Although short, above-ground movements may occur during the winter, Alameda whipsnake individuals generally retreat in November into a hibernaculum (shelter used during the snake's dormancy period) and emerge in March (United States Fish and Wildlife Service, 2006). Courtship and mating occur from late March through mid-June. Grassland habitats are used by males most extensively during the mating season in spring. Females use grassland areas most extensively after mating, possibly in their search for suitable egg-laying sites. The only reported evidence of Alameda whipsnake egg-laying is within a grassland community adjacent to a chaparral community. This egg-laying occurred within a few feet of scrub on un-grazed grassland interspersed with lots of scattered shrubs (United States Fish and Wildlife Service, 2006).

Alameda whipsnakes currently inhabit the inner coast range, mostly in Contra Costa and Alameda Counties, with additional occurrences in San Joaquin and Santa Clara Counties, and core areas most commonly occur on east, south, southeast, and southwest facing slopes. However, recent information indicates that Alameda whipsnakes do make use of north facing slopes in more open stands of scrub habitat. The current distribution of the subspecies has been reduced to five separate population

areas with little or no interchange due to habitat loss, alteration, and fragmentation. Three of these five areas are in Contra Costa County, with the other two in Alameda County. The BSA is situated between the Tilden-Briones and Oakland-Las Trampas population areas to the west, and the Mount Diablo-Black Hills population area to the east (United States Fish and Wildlife Service, 2006).

No focused surveys were conducted for Alameda whipsnake; however, habitat in the BSA was assessed as part of the general wildlife/habitat study. Potentially suitable foraging and breeding habitat for Alameda whipsnake is present but extremely limited within the BSA. Scrub and oak woodland habitat with rock outcrops and abundant prey resources (specifically western fence lizards) occur adjacent to the BSA and may provide suitable habitat for the species.

There are 24 CNDDB occurrences of Alameda whipsnake within 4 miles of the BSA. Several of these occurrences are within or just north of the designated critical habitat, which encompasses Las Trampas Ridge. Urban development borders the highway in this area, which further separates the BSA from more open, natural areas where Alameda whipsnake are most likely to occur.

Northwestern Pond Turtle

Northwestern pond turtle is a proposed federally threatened species and California Species of Special Concern (California Department of Fish and Wildlife, 2022). Northwestern pond turtles occur in a variety of aquatic habitats, such as ponds, marshes, rivers, streams, and ephemeral pools. They require deep, slack, or slow-moving water habitat for feeding, suitable unshaded dry habitat for basking and hauling out, and upland nesting areas. No critical habitat has been designated for this species.

No northwestern pond turtles were observed during field surveys. No focused surveys were conducted for this species. Northwestern pond turtles are known to be present immediately adjacent to the BSA in both McNabney Marsh and Moorhen Marsh. There are also CNDDB occurrences of the species from Pacheco Creek and Grayson Creek. The Mt. View Sanitary District maintains Moorhen Marsh, west of the southbound I-680 shoulder between PM 23.7 and PM 23.9. The 20-acre marsh is a constructed feature that receives treated wastewater and provides suitable habitat for northwestern pond turtles. In 2014, Mt. View Sanitary District estimated 80–100 northwestern pond turtles inhabited the 20-acre marsh (California Department of Transportation, 2014). Portions of this marsh are within 100 feet of the BSA. A chain-link fence along Moorhen Marsh provides a movement barrier for northwestern pond turtle, inhibiting their access to the BSA, though hatchlings for a time are small enough to potentially fit through the fence.

Western Burrowing Owl

Western burrowing owl is a California Species of Special Concern (California Department of Fish and Wildlife, 2025). California Fish and Game Commission received a petition to list the western burrowing owl as threatened or endangered under the CESA on March 26, 2024. On October 10, 2024, the California Fish and Game

Commission voted that listing the species as endangered or threatened may be warranted throughout its entire range in California. As a candidate species, the species is temporarily afforded the same protections as State-listed endangered or threatened species, including protection from "take" under Section 2081(b) of the California Code of Regulations.

Western burrowing owls prefer open, flat, or sloped grasslands and require burrows for nesting and wintering habitat, but they will also nest in artificial structures, such as open pipes, concrete rubble piles, and small, dry culverts. They inhabit burrows that are at least 4 inches in diameter and at least 5 feet deep. Burrowing owls forage in grasslands, the margins of agricultural fields, and urban areas with short vegetation or bare soil.

Brome grassland habitat within the BSA may provide suitable habitat for the species. However, Project biologists did not identify any potential burrows suitable for western burrowing owls in the grassland during field studies. There is one CNDDB occurrence of this species within a 2-mile radius of the BSA. Focused burrowing owl surveys following CDFW species protocol were conducted for past, unrelated projects that overlap the BSA. Based on the fragmented nature of suitable habitat within the BSA, the low density of appropriately sized burrows, and the absence of detections during focused surveys for past, unrelated projects, it is unlikely burrowing owls would occur in the BSA. However, burrowing owls could occupy areas of the BSA containing suitable habitat in the future.

California Black Rail

The California black rail is not federally listed but is listed as threatened under CESA and is a State fully protected species (California Department of Fish and Wildlife, 2025). The bulk of the population is restricted to the northern reaches of San Francisco Estuary's (San Pablo Bay) tidal marshlands (California Wildlife Habitat Relationships, 1999). California black rails are associated with high overall vegetation cover, high cover of small tidal channels, and low cover of saltgrass, tule (*Schoenoplectus acutus*), and California bulrush (*Schoenoplectus californicus*). The species is more likely to be present in larger marshes with higher proportions of adjacent natural upland or agriculture and is less likely in more isolated marshes. California black rails require access to vegetated upper marsh as refuge from predation during high tides, particularly where the marsh vegetation is low. They commonly nest in pickleweed and alkali bulrush.

No focused surveys were conducted for California black rail. Suitable habitat for this species occurs within Waterbird Regional Preserve – McNabney Marsh (saltgrass flat, cattail, and common reed marsh). Portions of the Waterbird Regional Preserve are adjacent to the northern portion of the BSA. There are four CNDDB occurrences of California black rail within a 2-mile radius of the BSA.

California Ridgway's Rail

The California Ridgway's rail is a federally and State-listed endangered species (California Department of Fish and Wildlife, 2025). This species was known formerly as California clapper rail (*Rallus longirostris obsoletus*). It was reclassified recently and is no longer considered conspecific with clapper rail, which is found on the Gulf and Atlantic coasts. USFWS has not yet adopted this reclassification; therefore, it is still identified as California clapper rail under FESA.

Throughout their distribution, California Ridgway's rails occur within salt and brackish marshes. In south and central San Francisco Bay and along the perimeter of San Pablo Bay, these rails typically inhabit salt marshes dominated by pickleweed and Pacific cordgrass. Pacific cordgrass dominates the middle marsh zone throughout the south and central Bay.

In the north Bay (Petaluma Marsh, Napa-Sonoma Marshes, Suisun Marsh), California Ridgway's rails also live in tidal brackish marshes, which vary significantly in vegetation structure and composition. Use of brackish marshes by California Ridgway's rails is restricted largely to major sloughs and rivers of San Pablo Bay and Suisun Marsh and along Coyote Creek in south San Francisco Bay. California Ridgway's rails have rarely been recorded in non-tidal marsh areas.

California Ridgway's rails are almost entirely restricted to the marshes of the San Francisco Estuary, where the only known Bay Area breeding populations occur. In south San Francisco Bay, populations occur in all of the larger tidal marshes. In San Pablo Bay and Suisun Bay, its distribution is patchy and discontinuous, occurring along major sloughs and rivers of San Pablo Bay and along major tidal sloughs of Suisun Marsh (United States Fish and Wildlife Service, 2015).

Breeding California Ridgway's rails require tidal marshes with a well-developed tidal channel system with full tidal influence, cordgrass, and a vegetated upper marsh/upland ecotone. The minimum marsh size likely to be used by California Ridgway's rail is estimated at approximately 2.5 acres. The maximum dispersal distance recorded in radio telemetry studies is approximately 1.9 miles.

Marginal California Ridgway's rail habitat occurs within the BSA at the northern end of McNabney Marsh (saltgrass flats). In April 2013, a California Ridgway's rail vocalization was detected at McNabney Marsh (California Department of Transportation, 2014). Follow-up surveys conducted from February through April 2014 did not detect California Ridgway's rail in the McNabney Marsh. There are no CNDDB occurrences, nor any records of California Ridgway's rail archived in citizen science databases, such as eBird or iNaturalist, at McNabney Marsh. California Ridgway's rail is not listed on the McNabney Marsh Bird Checklist (Mt View Sanitation District, 2015). All other documented records of California Ridgway's rail from within 5 miles of the BSA, besides the 2013 detection, have been from north of the tide gates along the San Pablo Bay shoreline where the natural tidal channels and greater amount of cordgrass make the habitat much more suitable for the species than the habitat in McNabney Marsh.

Salt-Marsh Harvest Mouse

The salt-marsh harvest mouse is a federally and State-listed endangered species and State fully protected species (California Department of Fish and Wildlife, 2025).

This small rodent is endemic to the San Francisco Bay. The mouse is a cover-dependent species that resides mainly in large pickleweed stands within a marsh complex. However, they also depend on adjacent higher ground, usually made up of peripheral halophytes, to escape the high tide. They are largely nocturnal and are active year-round, with a breeding season of March through November. Their diet consists largely of salt grass and pickleweed, as well as occasional insects and seeds (United States Fish and Wildlife Service, 2010b).

This species is threatened due to habitat destruction and disturbance from development and the intrusion of fresh water into salt marshes within San Francisco Bay as a result of anthropogenic alteration of hydrology through landscape conversion. Further, in many marsh habitats there are no longer any higher grounds to escape to during occurrences of high tide. In many cases what little high ground is left provides little to no cover for the animals, so they become easy prey to feral house cats and non-native red foxes (United States Fish and Wildlife Service, 2010b).

There are four CNDDB occurrences of this species within a 2-mile radius of the BSA. No protocol level surveys were conducted for the salt-marsh harvest mouse. Suitable habitat for this species occurs in the BSA within McNabney Marsh. However, the associated marsh habitat does not occur within any of the proposed construction areas.

2.3.5.3 Environmental Consequences

No-Build Alternative

The No-Build Alternative would maintain the current configurations of I-680 in the BSA. Under the No-Build Alternative, the proposed Project would not be constructed, and no impact on threatened or endangered species would occur. Routine maintenance activities would be subject to additional environmental review and required to comply with USFWS and CDFW requirements regarding protected wildlife species, should those species be identified within areas that would be directly or indirectly affected by such activities along I-680.

Build Alternatives (Alternatives 1C, 2, 3, and 5)

Effects determinations for federally listed species and designated critical habitat are listed in Table 2.3.5-2 through Table 2.3.5-7 below. A discussion of potential project impacts on both state and federally listed species is also provided below.

Table 2.3.5-2. Federal Endangered Species Act Effect Findings for Plants

Common Name	Scientific Name	Status	Effect Finding	Effect Finding for Critical Habitat (if applicable)
Antioch Dunes Evening-primrose	*Oenothera deltoids* ssp. *howellii*	Federal Endangered	No Effect	No Effect
Contra Costa Goldfields	*Lasthenia conjugens*	Federal Endangered	No Effect	No Effect
Contra Costa Wallflower	*Erysimum capitatum* var. *angustatum*	Federal Endangered	No Effect	No Effect
Pallid Manzanita	*Arctostaphylos pallida*	Federal Threatened	No Effect	N/A
Presidio Clarkia	*Clarkia franciscana*	Federal Endangered	No Effect	N/A
Robust Spineflower	*Chorizanthe robusta* var. *robusta*	Federal Endangered	No Effect	No Effect
Santa Cruz Tarplant	*Holocarpha macradenia*	Federal Threatened	No Effect	No Effect
Soft Bird's-beak	*Cordylanthus mollis* ssp. *mollis*	Federal Endangered	No Effect	No Effect

Source: (HDR Engineering, Inc., 2023)
Note: N/A = not applicable; ssp. = subspecies; var = varietal

Table 2.3.5-3. Federal Endangered Species Act Effect Findings for Invertebrates

Common Name	Scientific Name	Status	Effect Finding	Effect Finding for Critical Habitat (if applicable)
Bay Checkerspot	*Euphydras Editha bayensis*	Federal Threatened	No Effect	No Effect
Callippe Silverspot	*Speyeria callippe callippe*	Federal Endangered	No Effect	N/A
Conservancy Fairy Shrimp	*Branchinecta conservatio*	Federal Endangered	No Effect	No Effect
Monarch Butterfly	*Danaus plexippus*	Federal Proposed Threatened	No Effect	N/A
Vernal Pool Fairy Shrimp	*Branchinecta lynchi*	Federal Threatened	No Effect	No Effect
Vernal Pool Tadpole Shrimp	*Lepidurus packardi*	Federal Endangered	No Effect	No Effect

Source: (HDR Engineering, Inc., 2023)
Note: N/A = not applicable

Table 2.3.5-4. Federal Endangered Species Act Effect Findings for Fish

Common Name	Scientific Name	Status	Effect Finding	Effect Finding for Critical Habitat (if applicable)
Chinook Salmon (Central Valley Spring-run ESU)	*Oncorhynchus tshawytscha* pop. 11	Federal Threatened	No Effect	No Effect
Chinook Salmon (Sacramento River Winter-run ESU)	*Oncorhynchus tshawytscha* pop. 7	Federal Endangered	No Effect	No Effect
Green Sturgeon (Southern DPS)	*Acipenser medirostris* pop.1	Federal Threatened	No Effect	No Effect
Longfin Smelt (San Francisco Bay-Delta DPS)	*Spirinchus thaleichthys* pop. 2	Federal Endangered	No Effect	No Effect
Steelhead (Central California Coast DPS)	*Oncorhynchus mykiss irideus* pop. 8	Federal Threatened	No Effect	No Effect
Steelhead (Central Valley DPS)	*Oncorhynchus mykiss irideus* pop. 11	Federal Threatened	No Effect	No Effect
Tidewater Goby	*Eucyclogobius newberryi*	Federal Endangered	No Effect	No Effect

Source: (HDR Engineering, Inc., 2023)
Note: ESU = evolutionarily significant unit; DPS = distinct population segment; pop. = population

Table 2.3.5-5. Federal Endangered Species Act Effect Findings for Amphibians and Reptiles

Common Name	Scientific Name	Status	Effect Finding	Effect Finding for Critical Habitat (if applicable)
Alameda whipsnake (= striped racer)	*Masticophis (= Coluber) lateralis euryxanthus*	Federal Threatened	May Affect, Not Likely to Adversely Affect	No Effect
California Red-legged Frog	*Rana draytonii*	Federal Threatened	May Affect, Not Likely to Adversely Affect	No Effect
California Tiger Salamander (Central California DPS)	*Ambystoma californiense* pop. 1	Federal Threatened	No Effect	No Effect
Foothill Yellow-legged Frog (Central Coast DPS)	*Rana boylii*	Federal Threatened	No Effect	No Effect
Giant Gartersnake	*Thamnophis gigas*	Federal Threatened	No Effect	N/A
Northwestern Pond Turtle	*Actinemys marmorata*	Federal Proposed Threatened	May Affect, Not Likely to Adversely Affect	N/A
Western Spadefoot	*Spea hammondii*	Federal Proposed Threatened	No Effect	N/A

Source: (HDR Engineering, Inc., 2023)
Note: DPS = distinct population segment; N/A = not applicable; pop. = population

Table 2.3.5-6. Federal Endangered Species Act Effect Findings for Birds

Common Name	Scientific Name	Status	Effect Finding	Effect Finding for Critical Habitat (if applicable)
California Least Tern	*Sternula antillarum browni*	Federal Endangered	No Effect	N/A
California Ridgeway's rail	*Rallus obsoletus obsoletus*	Federal Endangered	No Effect	N/A
Western Snowy Plover	*Charadrius nivosus nivosus*	Federal Threatened	No Effect	No Effect

Source: (HDR Engineering, Inc., 2023)
Note: N/A = not applicable

Table 2.3.5-7. Federal Endangered Species Act Effect Findings for Mammals

Common Name	Scientific Name	Status	Effect Finding	Effect Finding for Critical Habitat (if applicable)
Salt-marsh Harvest Mouse	*Reithrodontomys raviventris*	Federal Endangered	No Effect	N/A
San Joaquin Kit Fox	*Vulpes macrotis mutica*	Federal Endangered	No Effect	N/A

Source: (HDR Engineering, Inc., 2023)
Note: N/A = not applicable

Crotch's Bumble Bee and Western Bumble Bee

All Build Alternatives are expected to have a maximum of 1.73 acres of permanent impacts on brome grassland, 0.16 acre of impacts on coast live oak woodland, and a combined total of 1.59 acres of impacts on non-native woodland and semi-natural ornamental habitats, which are potentially suitable habitat for Crotch's and western bumble bees. It should be noted that Alternative 5 would have no impact on coast live oak woodland or non-native woodland habitats. Potential direct impacts on these bumble bee species, should they be present, include removal of nests or foraging plants, loss of nest habitat, or direct mortality during ground disturbance. Indirect impacts could include changes in foraging behavior, nest abandonment or reduced nest success as a result of increased noise or artificial light, or fugitive dust encroaching on suitable habitat beyond proposed Project construction areas resulting in detrimental impacts on nectar sources. However, all Build Alternatives would implement the standard and general measures (**BIO-GEN-1** through **BIO-GEN-16**) described in Section 2.3.1, *Natural Communities*, as well as Measure **BIO-BEE-1**, which would require pre-construction surveys be performed, and any bumble bee nests found to be mapped, flagged, and avoided. Therefore, direct and indirect impacts on Crotch's and western bumble bees would be minimized or avoided.

Monarch Butterfly

While there is potential for monarch to occur in the BSA, especially passing through during migration, it is not likely for the species to overwinter in non-native woodland or semi-natural ornamental areas in the BSA because the BSA is situated several miles inland from the species' known overwintering range. Furthermore, no milkweed was observed in the BSA during field surveys, which monarchs depend on to complete their life cycle. It is likely that the species only transits through the BSA and does not breed or winter there. As a result, it is considered very unlikely that the proposed Project would impact this species. All Build Alternatives would implement the standard and general measures (**BIO-GEN-1** through **BIO-GEN-16**) described in Section 2.3.1, *Natural Communities*. Species-specific measures are not proposed.

California Red-Legged Frog

The land surrounding the BSA is almost entirely urban, consisting of residential and commercial development, along with several heavily traveled roads. This development, which contains structural barriers including, but not limited to, concrete road dividers, retaining walls, and residential fences presents major barriers to the dispersal of California red-legged frogs. Due to the absence of breeding habitat and limited aquatic dispersal habitat within the BSA, in conjunction with multiple passage barriers, there is a low likelihood that California red-legged frogs would be found within the BSA or affected by Project activities.

Direct impacts on California red-legged frog could occur within the proposed Project construction areas as a result of being crushed by construction equipment or trapped in open excavations, or if fugitive dust from construction activities or artificial lighting from

the proposed Project were to encroach on suitable California red-legged frog habitat outside the construction areas. However, all Build Alternatives would implement the standard and general measures (**BIO-GEN-1** through **BIO-GEN-16**) described in Section 2.3.1, *Natural Communities*. These measures include a requirement for USFWS-approved biologists to monitor certain construction activities in or adjacent to California red-legged frog habitat (**BIO-GEN-1**). In addition, measures **BIO-FWS-1** through **BIO-FWS-4** would be implemented requiring preconstruction surveys, stopping work if a California red-legged frog is observed, stopping work during rain events, and the preparation of a post-construction report that would be submitted to USFWS, respectively. Therefore, direct and indirect impacts on the California re-legged frog would be minimized or avoided.

Alameda Whipsnake

All Build Alternatives would permanently impact up to 1.73 acres of brome grassland, and all Build Alternatives, except Alternative 5, would impact up to 0.16 acre of coast live oak woodland, which is potentially suitable dispersal habitat for Alameda whipsnake. Direct effects on Alameda whipsnake could occur within the proposed Project construction areas as a result of being crushed by construction equipment, trapped in open excavations, or if fugitive dust from construction activities or artificial lighting from the proposed Project were to encroach on suitable Alameda whipsnake habitat outside the construction areas. However, all Build Alternatives would implement the standard and general measures (**BIO-GEN-1** through **BIO-GEN-16**) described in Section 2.3.1, *Natural Communities.* These measures include a requirement for USFWS-approved biologists to monitor certain construction activities in or adjacent to Alameda whipsnake habitat (**BIO-GEN-1**). In addition, measures **BIO-FWS-1** through **BIO-FWS-4** would be implemented requiring preconstruction surveys, stopping work if an Alameda whipsnake is observed, stopping work during rain events, and the preparation of a post-construction report that would be submitted to USFWS, respectively. Therefore, direct and indirect impacts on the Alameda whipsnake would be minimized or avoided.

Northwestern Pond Turtle

Northwestern pond turtles are most likely to occur in the BSA in the vicinity of McNabney Marsh and Moorhen Marsh, from PM 23.5 north to the Benicia-Martinez Bridge Toll Plaza. The furthest north that construction activities associated with the proposed Project would occur is between PM 23.2, which is south of McNabney Marsh. Electrical conduit for permanent lighting would be installed along the shoulder of northbound I-680 between Arthur Road and PM 23.1, and advance signage would be installed within Caltrans ROW up to PM 23.2.

There is a low potential for the species to occur in San Ramon Creek at the Rudgear Road Undercrossing Bridge. Alternatives 1C, 2, and 3 would widen the Rudgear Road Undercrossing Bridge. Alternative 5 would not widen this bridge. At this location, San Ramon Creek is concrete-lined, and the surrounding ground is hardscaped. These conditions do not provide suitable nesting habitat for the species in that area, but the

species may use the creek for dispersal between areas of more suitable habitat. Falsework would be installed over San Ramon Creek preventing debris and other contaminants from entering the creek during construction.

Direct impacts on northwestern pond turtle could occur within the proposed Project construction areas as a result of being crushed by construction equipment or trapped in open excavations or if fugitive dust from construction activities or artificial lighting from the proposed Project were to encroach on suitable habitat outside the construction areas. However, all Build Alternatives would implement the standard measures in Section 1.4.1.6, *Standardized Project Measures*, and the general measures (**BIO-GEN-1** through **BIO-GEN-16**) described in Section 2.3.1, *Natural Communities*, as well as Measure **BIO-TURTLE-1**, which would require pre-construction surveys be performed to avoid directly impacting the northwestern pond turtle.

Western Burrowing Owl

All Build Alternatives would permanently impact up to 1.73 acres of brome grassland (see Table 2.3.1-3, *Estimated Areas of Impacts on Land Cover Types – By Alternative*) that is potentially suitable habitat for western burrowing owl. Direct impacts on western burrowing owls could occur within the proposed Project construction areas if an occupied burrow were to be dug up during ground disturbance or crushed by construction equipment. Other direct impacts could occur from construction generated noise disturbing or disrupting nesting individuals, fugitive dust leaving the proposed Project construction areas and affecting an active nest, or artificial light from the proposed Project (either from nighttime construction or newly installed permanent lighting) disrupting nesting or roosting individuals. However, all Build Alternatives would implement the standard measures in Section 1.4.1.6, *Standardized Project Measures*, and the general measures (**BIO-GEN-1** through **BIO-GEN-16**) described in Section 2.3.1, *Natural Communities*, as well as Measure **BIO-OWL-1**, which would require protocol surveys to be performed prior to construction. Therefore, direct and indirect impacts on western burrowing owl would be minimized or avoided.

California Black Rail, California Ridgway's Rail, and Salt-Marsh Harvest Mouse

Suitable California black rail, California Ridgway's rail, and salt-marsh harvest mouse habitat occurs within the BSA at McNabney Marsh. However, no construction activities associated with the proposed Project would occur north of PM 23.2, which is south of the marsh habitat and separated from it by a housing development. The proposed Project was redesigned to avoid impacting marsh habitat at McNabney Marsh. The proposed Project would install luminaires and Variable Toll Message Signs (VTMS) in the highway median up to PM 23.1 and would install electrical conduit underground via trenching from Arthur Road. Light spread from the new luminaires would not reach the marsh habitat, and noise associated with any of these construction activities would not be anticipated to impact California black rail, California Ridgway's rail, or salt-marsh harvest mouse.

All Build Alternatives would implement the standard and general measures (**BIO-GEN-1** through **BIO-GEN-16**) described in Section 2.3.1, *Natural Communities*. Due to the distance between marsh habitat and the Project's impact areas, species-specific measures are not proposed for California black rail, California Ridgway's rail, or salt-marsh harvest mouse.

Federal Endangered Species Act Consultation

Caltrans preliminarily determined that the proposed Project "may affect, but is not likely to adversely affect" the following species: California red-legged frog, Alameda whipsnake, and northwestern pond turtle. Although the northwestern pond turtle is currently proposed federally threatened, Caltrans is treating it as federally threatened species for the purposes of this Project. Caltrans has determined that the proposed Project would have "no effect" on any other federally listed species or designated critical habitat under all Build Alternatives.

Caltrans prepared a Biological Assessment for Alternative 2 (the preferred alternative) and received a Letter of Concurrence from USFWS, dated May 7, 2025, for the California red-legged frog and Alameda whipsnake. The Letter of Concurrence is available in Appendix F, *Consultation and Coordination*. General and species-specific measures were updated to be consistent with the Letter of Concurrence, which includes adding biological monitoring (**BIO-GEN-1**), increasing stop work buffers to 1,000 feet for listed species (**BIO-FWS-1**), adding rain restrictions (**BIO-FWS-3**), and requiring a post-construction report be submitted to USFWS documenting compliance with the Letter of Concurrence (**BIO-FWS-4**). Reinitiation of consultation may be required should the northwestern pond turtle be listed as threatened or endangered under the FESA prior to construction or other Project changes occur.

California Endangered Species Act Consultation

Caltrans determines this proposed Project will not result in take of Alameda whipsnake as defined in Sections 2081(b) and (c) of CESA. Take of other State-listed species is not anticipated. As discussed above, Measure **BIO-BEE-1** would be implemented requiring preconstruction surveys and any observed bumble bee nest be mapped, flagged, and avoided. In addition, protocol surveys would be performed prior to construction to confirm that western burrowing owls or their burrows are not in construction areas, pursuant to Measure **BIO-OWL-1**. If an occupied burrow or structure is discovered, the biologist will establish an appropriately sized buffer around it following CDFW's 2012 guidelines.

2.3.5.4 Summary

Alternative 2 has been selected as the preferred alternative. Caltrans preliminarily determined that the proposed Project "may affect, but is not likely to adversely affect" the following federally-listed species: California red-legged frog, Alameda whipsnake, and northwestern pond turtle (proposed). The USFWS Letter of Concurrence is available in in Appendix F, Consultation and Coordination. General measures

***BIO-GEN-1** through **BIO-GEN-16** and Measures **BIO-BEE-1**, **BIO-TURTLE-1**, and **BIO-FWS-1** through **BIO-FWS-4** would be implemented requiring biological monitoring, pre-construction surveys, and avoidance of listed species. Reinitiation of consultation with USFWS may be required should the northwestern pond turtle be listed prior to or during construction or other Project changes occur.*

*The Project is not anticipated to result in the "take" of any State-listed species. Measure **BIO-BEE-1** would be implemented requiring pre-construction surveys be performed, and any observed bumble bee nest be mapped, flagged, and avoided. Measure **BIO-OWL-1** would be implemented requiring protocol surveys for western burrowing owls and avoidance of occupied burrows and structures.*

2.3.5.5 Avoidance, Minimization, and/or Mitigation Measures

In addition to the general biological resources measures provided in Section 2.3.1, *Natural Communities* (**BIO-GEN-1** through **BIO-GEN-16**), and **BIO-BEE-1** in Section 2.3.4, *Animal Species*, the following species-specific avoidance and minimization measures would be implemented:

BIO-TURTLE-1 **Northwestern Pond Turtle Preconstruction Surveys.** A USFWS-approved biologist will conduct a pre-construction survey to ensure northwestern pond turtles are absent from the proposed impact area prior to any ground disturbance at the following locations:

- Pacheco Boulevard area near Pacheco Creek (PM 22.5 – PM 21.8)
- I-680/State Route (SR) 4 Interchange near Grayson Creek (PM 21.0 – PM 20.9)
- Willow Pass Road to Monument Boulevard near Walnut Creek (PM R19.2 and PM R18.2)
- Rudgear Road to Livorna Road near San Ramon Creek (PM R12.7 and PM R11.3)

If a northwestern pond turtle is observed in any proposed impact area, ground disturbance would not commence until the turtle leaves the proposed impact area on its own.

BIO-OWL-1 **CDFW Protocol Surveys.** A Caltrans-approved biologist will conduct burrowing owl surveys in brome grassland habitat in and within 500 meters (1,640 feet) of the BSA (if accessible) following CDFW's protocols (CDFW 2012) in the year prior to ground disturbance. Surveys will be repeated if construction is delayed or suspended for more than 30 days. If an occupied burrow or

structure is discovered, the biologist will establish an appropriately sized buffer around it following CDFW's 2012 guidelines.

Caltrans informally consulted with USFWS under FESA Section 7 for the California red-legged frog and Alameda whipsnake. The following species-specific measures were added as a result of informal consultation with USFWS:

BIO-FWS-1 **Listed Species Observation.** If California red-legged frog, Alameda whipsnake, or another listed species is discovered in the Project footprint, any off-pavement construction activities within 1,000 feet of the discovery will stop and Caltrans will contact USFWS within one working day to determine if formal consultation should be completed prior to resuming activities. Notification will include the date, time, and location of the incident or the finding of a deceased or injured animal, clearly indicated on a 7.5-minute quadrangle and other maps at a finer scale as requested by USFWS, and any other pertinent information.

BIO-FWS-2 **Preconstruction Surveys.** Preconstruction surveys will be conducted for California red-legged frog and Alameda whipsnake by the USFWS-approved biologist immediately prior to ground-disturbing activities within or adjacent to suitable habitat, including vegetation removal, within the AA. These efforts will consist of walking surveys of the Project limits and accessible areas within at least 25 feet of the Project footprint. The USFWS-approved biologist will investigate areas of disturbed soil for signs of listed species within 30 minutes following initial disturbance of the given area. Preconstruction surveys should be conducted in the following areas:

- PM 22.5 – PM 21.8: Pacheco Boulevard area – between the work limits on the northbound side of I-680 and the habitat associated with Pacheco Creek to the north and east, as well as between the work limits on the southbound side of I-680 and its on-ramp from Pacheco Boulevard and the habitat associated with the unlined channel tributary to Pacheco Creek.

- PM 21.0 – PM 20.9: I-680/SR-4 Interchange area – between the work limits on the southbound side of I-680 and its on-ramp from SR-4 and the habitat associated with Grayson Creek to the south.

- PM R19.2 – PM R18.2: Willow Pass Road to Monument Boulevard area – between the work limits on the northbound side of I-680 and the habitat associated with Walnut Creek to the east.

BIO-FWS-3 **Rain Restrictions**. No work will occur within or adjacent to suitable listed species habitat 24 hours before, during, and 24 hours after a rain event. A qualifying rain event is defined to be any storm that produces or is forecasted to produce at least 0.50 inch of precipitation at the time of discharge, with a 48-hour dry period between events as measured by the National Oceanic and Atmospheric Administration National Weather Service for the Contra Costa County (WNG655) station. These areas will be fully surveyed by a USFWS-approved biologist for special-status species prior to the continuation of work.

BIO-FWS-4 **Post-Construction Report**. Caltrans will submit a post-construction compliance report to USFWS within 60 calendar days following completion of the proposed Project. This report shall detail:

1. Dates that relevant Project activities occurred;
2. Pertinent information concerning the success of the Project in implementing conservation measures;
3. An explanation of failure to meet such measures, if any;
4. Known Project effects on the California red-legged frog and Alameda whipsnake;
5. Habitat impacts that occurred during construction, including any tree or shrub removals that occurred;
6. Revegetation activities that occurred to temporarily impacted areas;
7. Lighting installed and a determination on whether the light spread from the new permanent lighting fixture matches up with the projected light spread in the Biological Assessment;
8. Documentation of employee environmental education; and
9. Any other pertinent information.

With implementation of the above measures, disturbance of listed species and their habitat will be avoided or minimized; therefore, compensatory mitigation is not required. No species-specific measures are required for the monarch, California black rail, California Ridgway's rail, or salt-marsh harvest mouse.

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2.3.6 Invasive Species

2.3.6.1 Regulatory Setting

On February 3, 1999, President William J. Clinton signed Executive Order (EO) 13112 requiring federal agencies to combat the introduction or spread of invasive species in the United States. 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." Federal Highway Administration (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 National Environmental Policy Act (NEPA) analysis for a proposed project.

2.3.6.2 Affected Environment

The following discussion is derived from the proposed Project's *Natural Environment Study* (HDR Engineering, Inc., 2023), which was completed in April 2023. The biological study area (BSA) is described in Section 2.3.1, *Natural Communities*.

Several invasive plant species were documented during habitat assessment surveys in the BSA on February 14, 2020, February 17, 2021, and August 12, 2021. Table 2.3.6-1 includes a list of California Invasive Plant Council (Cal IPC) rated invasive plant species that were observed during surveys. Cal IPC's invasive species categorization is based on the ecological impacts of plant species. The categorization of High, Moderate, or Limited reflects the negative ecological impact of the species in California, not accounting for economic impacts or difficulty in management. Cal IPC (2022) provides the following definition for these categories:

- High – These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.

- Moderate – These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

- Limited – These species are invasive, but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to

moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be persistent and problematic locally.

Species assigned to any of these three categories (High, Moderate, or Limited) are considered invasive species. Two additional categories are Alert and Watch. Alert species are those that are categorized as High or Moderate but have limited dispersal in California. Watch species are those that pose a high risk of becoming invasive in the future.

Table 2.3.6-1. Cal IPC Rated Invasive Plants Observed in the BSA

Scientific Name	Common Name	Cal IPC Rating
Ailanthus altissima	Tree of heaven	Moderate
Arundo donax	Giant reed	High
Avena barbata	Slender wild oats	Moderate
Avena fatua	Common wild oats	Moderate
Brassica rapa	Field mustard	Limited
Bromus diandrus	Ripgut brome	Moderate
Bromus hordeaceus	Soft chess brome	Limited
Bromus madritensis spp. *rubens*	Red brome	High
Centaurea solstitialis	Yellow starthistle	High
Conium maculatum	Poison hemlock	Moderate
Cynara scolymus	Artichoke thistle	Moderate
Cytisus scoparius	Scotch broom	High
Dipsacus fullonum	Wild teasel	Moderate
Erodium cicutarium	Red-stemmed filaree	Limited
Eucalyptus camaldulensis	Red gum	Limited
Festuca perenne	Italian rye-grass	Moderate
Ficus carica	Edible fig	Moderate
Foeniculum vulgare	Fennel	High
Geranium dissectum	Cutleaf geranium	Limited
Hedera helix	English ivy	High

Scientific Name	Common Name	Cal IPC Rating
Hordeum marinum spp. *gussoneanum*	Mediterranean barley	Moderate
Lythrum hyssopifolia	Hyssop loosestrife	Limited
Mentha pulegium	Pennyroyal	Moderate
Oxalis pes-caprae	Bermuda buttercup	Moderate
Phoenix dactylifera	Date palm	Limited
Picris echioides	Bristly ox-tongue	Limited
Pipthatherum milaceum	Smilo grass	Limited
Plantago lanceolata	English plantain	Limited
Prunus sp.	fruiting tree sp.	Limited
Rubus armeniacus	Himalayan blackberry	High
Rumex crispus	Curly dock	Limited
Schinus mole	Peruvian pepper tree	Limited
Silybum marianum	Milk thistle	Limited
Torilis arvensis	Hedgeparsley	Moderate
Trifolium sp.	Clover	Moderate
Vinca major	Greater (big) periwinkle	Moderate

Source: (HDR Engineering, Inc., 2023)

2.3.6.3 Environmental Consequences

No-Build Alternative

The No-Build Alternative would maintain the current configurations of Interstate 680 (I-680) in the BSA. Under the No-Build Alternative, the proposed Project would not be constructed, and no impacts on invasive species would occur. Ongoing maintenance activities are required to comply with the requirements of EO 13112.

Build Alternatives (Alternatives 1C, 2, 3, and 5)

Construction activities have the potential to inadvertently spread noxious weed species. General biological resources measures (**BIO-GEN-1** through **BIO-GEN-16**) would be sufficient to avoid the introduction of invasive species.

In compliance with EO 13112 and guidance from FHWA, the landscaping and erosion control included in the Project would not use species listed as invasive. None of the species on the California list of invasive species is used by Caltrans for erosion control or landscaping along I-680. All equipment and materials would be inspected for the presence of invasive species and cleaned, if necessary. Extra precautions will be taken in particularly sensitive areas if invasive species are found in or next to the construction areas. These include the inspection and cleaning of construction equipment and eradication strategies to be implemented should an invasion occur.

2.3.6.4 Summary

*Alternative 2 has been selected as the preferred alternative. Construction activities have the potential to inadvertently spread noxious weed species. General biological resources measures (**BIO-GEN-1** through **BIO-GEN-16**) would be sufficient to avoid the introduction of invasive species. Therefore, impacts would not be adverse.*

2.3.6.5 Avoidance, Minimization, and/or Mitigation Measures

The general biological resources measures (**BIO-GEN-1** through **BIO-GEN-16**), described in Section 2.3.1, *Natural Communities*, would be sufficient to avoid the introduction of invasive species. No additional avoidance, minimization, or mitigation measures are required.

2.4 CUMULATIVE IMPACTS

Please note: Council on Environmental Quality (CEQ) NEPA Implementing Regulations that were contained in 40 Code of Federal Regulations (CFR) 1500 et seq. have been removed. Included in the removal was Section 1508 that defined cumulative impacts. However, consideration of cumulative impacts was included in the analyses for the Draft Environmental Document, prior to the removal of the CEQ regulations, and therefore has been retained in the Final Environmental Document for informational purposes only.

2.4.1 Regulatory Setting

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, as well as from agricultural development and the conversion to more intensive agricultural cultivation. These land use activities can degrade habitat and species diversity through consequences such as displacement and fragmentation of habitats and populations, alteration of hydrology, contamination, erosion, sedimentation, disruption of migration corridors, changes in water quality, and introduction or promotion of predators. They can also contribute to potential community impacts identified for the project, such as changes in community character, traffic patterns, housing availability, and employment.

The California Environmental Quality Act (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 the National Environmental Policy Act (NEPA) can be found in 40 CFR Section 1508.1.

2.4.2 Cumulative Impacts Analysis

2.4.2.1 Methodology

The cumulative impacts analysis determines whether the Build Alternatives, in combination with other past, present, or reasonably foreseeable projects, would result in a cumulative effect, and if so, whether the Build Alternatives' contribution to the cumulative impact would be considerable. Present and reasonably foreseeable future projects include land use developments, infrastructure, and other transportation improvements that are planned and funded and would be near the proposed Build Alternatives' improvements.

A proposed project would not contribute to a cumulative impact of a resource if that project does not result in any direct or indirect impact on a resource (California Department of Transportation, 2005). Council on Environmental Quality (CEQ) regulations require cumulative impact analyses to focus on actions "that are likely or probable, rather than those that are merely possible" (Federal Highway Administration, 2003).

A cumulative impacts analysis is required for resources with significant impacts under CEQA (see Chapter 3, *California Environmental Quality Act Evaluation*). In addition, a cumulative analysis is required for resources with a less than significant impact if the resource is in poor health, declining health, or at risk (California Department of Transportation, 2005).

The approach for analyzing cumulative impacts followed the California Department of Transportation's (Caltrans) 8-step process, as described in *Guidance for Preparers of Cumulative Impact Analysis Approach and Guidance*, which is as follows:

1. Identify resources to consider in the cumulative impacts analysis.
2. Define the Resource Study Area (RSA), or geographic boundary, for each cumulative impact analysis.
3. Describe the current health of each resource.
4. Identify any direct and/or indirect impacts the Build Alternative may contribute to a cumulative impact on the identified resources.
5. Identify a set of active projects to include in the cumulative impacts analysis.
6. Assess cumulative impacts.
7. Report the results of the cumulative impacts analysis.
8. Assess the need for additional avoidance, minimization, or mitigation measures to address any cumulative impacts (California Department of Transportation, 2005).

For Caltrans projects, each resource has a separate RSA rather than a single study area for all resources combined. The RSA boundaries for cumulative impacts analysis are also often broader than the boundaries used for analyzing the project's direct impacts.

The No-Build Alternative would maintain the current configurations of Interstate 680 (I-680). Under the No-Build Alternative, the proposed Project would not be constructed, and no cumulative environmental effects in combination with other projects would occur. Therefore, the No-Build Alternative is not discussed further in this section.

2.4.2.2 Cumulative Projects

The following tables list transportation corridor projects near the Project Study Limits, as well as projects specific to Caltrans District 4. They also include projects in cities near the Project Study Limits. These projects are in various stages of development.

Table 2.4.2-1. Proposed Planned Projects (CEQANet)

Project Name	Project Description	County	Sponsor
Oakland Alameda Access Project	Alameda County Transportation Commission (CTC) and Caltrans propose roadway improvements to increase mobility for travelers between Interstate 880 (I-880), the Posey and Webster Tubes, and the cities of Oakland and Alameda. Freeway-bound congestion would be reduced on local roadways. Existing interstate ramps would be reconstructed, local streets in downtown Oakland would be reconfigured, and bicycle and pedestrian connectivity would be improved within and between both cities.	Alameda	Caltrans District 4
Oak Park Properties Specific Plan	The Oak Park Properties Specific Plan contemplates two development projects (the Civic Project and the Residential Project) within the Specific Plan area (plan area) boundaries. The Civic Project includes construction of library facilities, a park, vehicular parking, roadway improvements, the creation of a new floodplain system with water detention basins, upgrading three existing outfalls to Grayson Creek, and the creation of a new pedestrian trail immediately west of the Grayson Creek Corridor. The Residential Project includes demolition of the vacant administrative offices, the County library building; and the paved parking lot, trees, and landscaping for development of 34 single family dwelling units, 7 accessory dwelling units, and a new pocket park.	Contra Costa	City of Pleasant Hill

Table 2.4.2-2. Proposed Planned Projects (Caltrans District 4 Specific Projects)

Project Name	Project Description	County	Sponsor
SR-4 Capital Preventative Maintenance Project	Caltrans proposes to resurface existing pavement, upgrade metal beam guard rails, improve drainage, and replace/upgrade curb ramps to meet Americans with Disabilities Act (ADA) standards. The purpose is to preserve and extend the service life of pavement structures, improve motorist safety, and meet ADA standards. This project is needed because the existing roadway exhibits pavement distress and will lead to further deterioration that will require major rehabilitation if left uncorrected. The existing guard rails and curb ramps do not meet current design standards.	Contra Costa	Caltrans District 4
I-680 Roadway Repair	Roadway repairs will occur at six locations along I-680 from PM 22.19 to PM 24.25.	Contra Costa	Caltrans District 4
RESTORE PAVEMENT – 4W900-0422000209	Restore uneven pavement, cold planning, and hot mix asphalt (HMA) repaving at PM 8.6 on Route 680 in the town of Danville, Contra Costa County.	Contra Costa	Caltrans District 4
Bridge Preservation Project – 3W750/0422000032	Work will include placing polyester concrete deck overlay, treating bridge deck with methacrylate, applying polyurethane under slabs to remove offset, repairing spalls, repairing asphalt concrete (AC) approaches, replacing joint seals, and upgrading drainage systems.	Contra Costa	Caltrans District 4
Bridge Preservation Project – 3W530/042100038	Work will include overlaying polyester on bridge decks and removing and replacing rail work at six bridges (Bridge Nos. 28-0221, 28-0222, 28-0199, 28-0200, 28-0166, and 28-0162). All removed delineation will be replaced.	Contra Costa	Caltrans District 4
Bridge Preservation 3Q520/0419000220	Cleaning and placing methacrylate on the deck of bridge 28-0274 on I-580. Paint bridge ID at both approaches/abutments. Methacrylate will also be placed on the deck of Bridge 28-0128R on I-680.	Contra Costa	Caltrans District 4
PAVEMENT SETTLEMENT 3W480/0421000373	Repair pavement settlement at Bollinger Canyon Road overpass toward southbound I-680, PM 2.89 in San Ramon, Contra Costa County.	Contra Costa	Caltrans District 4

Project Name	Project Description	County	Sponsor
Interstate 680 Roadway Rehabilitation Project	Caltrans proposes to rehabilitate the mainline roadway and ramp pavement on I-680 from the Koopman Road Undercrossing in the town of Sunol to the Alcosta Boulevard Overcrossing in the city of Dublin. The project also proposes to repair or replace drainage systems, replace or upgrade guardrails, replace and upgrade the concrete median barrier in Segments 4–6, replace all signs, and implement ADA curb ramp requirements. The roadway will be rehabilitated within the same alignment, and all work will be done within the State right-of-way. There will be no increase in lane capacity, and no temporary or permanent acquisition of new right-of-way.	Contra Costa	Caltrans District 4
I-680 Ramp Metering (04-1Q720K)	Caltrans State Highway Operation and Protection Program (SHOPP)project to install ramp metering along I-680 from I-580 through Contra Costa County. The project is currently in the Plans, Specifications, and Estimates (PS&E) phase with completion planned for the end of 2024. Construction completion is anticipated in 2028.	Contra Costa	Caltrans District 4
Northbound SR-242 Rehabilitation Project Concord (04-26980)	Caltrans Bay Area will replace 3,500 linear feet of concrete paving in both lanes #2 and #3 of northbound State Route (SR-242) in Concord.	Contra Costa County	Caltrans District 4

Table 2.4.2-3. Plan Bay Area 2050 Proposed Projects

Project Name	Project ID (RTP ID)	County	Sponsor
Corridor and Interchange Improvements SR-4 Contra Costa County	21-T06-031	Contra Costa	CCTA
Corridor and Interchange Improvements SR-24 Contra Costa County	21-T06-033	Contra Costa	CCTA

Source: (Association of Bay Area Governments and Metropolitan Transportation Commission, 2013)
Notes: CCTA = Contra Costa Transportation Authority; RTP = Regional Transportation Plan

Table 2.4.2-4. Other Proposed Projects

Project Name	Project Description	County	Sponsor
West County High-Capacity Transit Study: Express Bus Implementation Phase 1	The Transit Study evaluated public transportation options and identified funding opportunities to expand high-capacity transit service and access for residents in West County. It also examined how to encourage transit use and improve service in underserved communities. Freeway-flyer express service on I-80 operating from the Hercules Transit Center south to Berkeley, Emeryville, and Oakland.	Contra Costa	WCCTAC
15-Minute BART Feeder Network	Make County Connection services a viable alternative to driving a car. The system needs to consider increasing frequency during the peak commute periods.	Contra Costa	CCCTA
Downtown Concord Circulator	Implementation of a downtown circulator/trolley service that is similar to the Downtown Walnut Creek Trolley.	Contra Costa	CCCTA
I-680 Corridor Service Improvements	Enhanced transit service within the I-680 corridor, which includes new park and ride facilities constructed near I-680, more direct and local bus services between park and ride facilities and BART stations, the addition of auxiliary lanes on I-680 to allow buses to operate along the shoulders and bypass peak period congestion, and increased school bus service.	Contra Costa	CCCTA
Express Bus/Bus Rapid Transit (BRT) – Phase 2	Deployment of Livermore Amador Valley Transit Authority's (LAVTA) Route 10 Rapid Bus Program; phase 2 includes upgrades to and expansion of the initial Rapid Project.	Alameda	City of Dublin
I-680 Express Bus Service	Provide connections to other transit services; potential for electric buses or hydrogen fuel cell buses to be implemented in the future.	Alameda and Contra Costa	CCTA and LAVTA

Project Name	Project Description	County	Sponsor
Lamorinda Bicycle and Pedestrian Connectivity Program	Sidewalk gap closures, bicycle connection to transit locations.	Contra Costa	SWAT
Martinez Intermodal Station – Crockett Bay Trail Gap Closure Project	This project will construct a Class 1, shared-used path from Berrellesa Street along the railroad track to the Nejedly Staging Area at Carquinez Strait Regional Shoreline.	Contra Costa	East Bay Regional Park District
Iron Horse/BART Connector South	Trail to transit connection.	Contra Costa	Walnut Creek
Iron Horse Trail to Walnut Creek BART North	Trail to transit connection.	Contra Costa	Walnut Creek
Open Road Tolling Conversion Northern Bridges (04-2W520)	Convert the Antioch Bridge, Benicia-Martinez Bridge, and Carquinez Bridge toll plazas to open road tolling. The project is currently in PA/ED phase. Construction is anticipated to begin in 2026.	Contra Costa	BATA
Coordinated Adaptive Ramp Metering (CARM) Project (04-0Q960)	CARM project will implement an adaptive ramp metering system on northbound I-680 between Alcosta Boulevard and Olympic Boulevard initially, and a future phase will expand that to both directions of I-680 in Contra Costa County. The project is currently in the PS&E phase. Construction is anticipated to begin in 2026.	Contra Costa	CCTA
I-680/SR-4 Interchange Improvement Project (04-22914)	The I-680/SR-4 Interchange Improvement Project will widen approximately four miles of SR-4 in both directions between Morello Avenue in Martinez and SR-242 by adding an additional lane in the eastbound and westbound directions to improve on-ramp and off-ramp merging. Construction for Phases 1, 2a, and 4 is anticipated to begin in 2025. Phase 3 was completed in 2021.	Contra Costa	CCTA

Project Name	Project Description	County	Sponsor
I-680 Express Lanes Project, Sunol to Alcosta Boulevard in San Ramon (04-0Q3000)	The I-680 Express Lanes from SR-84 to Alcosta Boulevard Project will close the gap between existing and in-progress high-occupancy vehicle (HOV)/express lane projects directly to the north and south. The project extends for approximately 9 miles on northbound and southbound I-680 through Sunol, Pleasanton, Dublin and San Ramon. Phase 1 started construction in 2023. Phase 2 would focus on northbound.	Alameda and Contra Costa County	Alameda CTC
Alameda I-680 Roadway Rehabilitation Project (04-0J620)	Caltrans and Alameda CTC will begin construction on several projects on I-680 in Alameda County in the cities of Fremont and Pleasanton and the town of Sunol.	Alameda	Alameda CTC
Bayview Residential Project	This project proposes 144 single-family homes and associated internal roadways on an approximately 78-acre project site in the Vine Hill/Pacheco Boulevard area.	Contra Costa	Developer
Oak Road Townhouse Condominiums	This 5.94-acre project site consists of eight parcels and is located at 2740 Jones Road.	Contra Costa	Developer
Tassajara Parks Housing Development	This project would consist of the construction of 125 single-family homes with substantial park, recreation, and open space components in the Tassajara Valley area of unincorporated Contra Costa County	Contra Costa	Developer

Notes: BART = Bay Area Rapid Transit; BATA = Bay Area Toll Authority; Alameda CTC = Alameda County Transportation Commission; CCCTA = Central Contra Costa Transit Authority; CCTA = Contra Costa Transportation Authority; LAVTA = Livermore Amador Valley Transit Authority; PA/ED = Project Approval and Environmental Document; PS&E = Plans, Specifications and Estimate; WCCTAC = West Contra Costa Transportation Advisory Committee; SWAT = Southwest Area Transportation Committee

2.4.2.3 Resource Topics with No Contribution to Cumulative Impacts

The resources considered in the cumulative impacts analysis follow Caltrans' 8-step process for identifying and assessing cumulative impacts (California Department of Transportation, 2005). For resource areas that would have no adverse impacts from the proposed Project, incremental impacts would not be cumulatively considerable. Therefore, cumulative impacts are not anticipated for the following topic areas:

- Existing and Future Land Use (Section 2.1.1)
- Consistency with State, Regional, and Local Plans and Programs (Section 2.1.2)
- Parks and Recreational Facilities (Section 2.1.3)
- Growth (Section 2.1.4)
- Community Character and Cohesion (Section 2.1.5)
- Environmental Justice (Section 2.1.6)
- Utilities/Emergency Services (Section 2.1.7)
- Cultural Resources (Section 2.1.10)
- Hydrology and Floodplain (Section 2.2.1)
- Water Quality and Stormwater Runoff (Section 2.2.2)
- Geology/Soils/Seismic/Topography (Section 2.2.3)
- Paleontology (Section 2.2.4)
- Hazardous Waste/Materials (Section 2.2.5)
- Noise and Vibration (Section 2.2.7)
- Energy (Section 2.2.8)

2.4.2.4 Resources Considered for Cumulative Impact Analysis

Visual/Aesthetics

The I-680 corridor is an officially designated state scenic highway between SR-24 in the city of Walnut Creek and Mission Boulevard in the city of Fremont. Additionally, there are sections of the I-680 corridor that are classified as landscaped freeway for Contra Costa County. The project area is also surrounded by numerous mountain features, which include Mount Diablo. Multiple signs currently overlap views of scenic resources

along I-680, including Mount Diablo and foothills. In addition, I-680 was, and continues to be in many sections, a tree-lined highway. The mature trees, originally planted in response to citizen demands for highway screening, are being removed as the highway continues to be widened. With the addition of travel lanes, the remaining space between the shoulder edge and right-of-way line is often too narrow to accommodate replacement tree planting.

Several of the projects listed in Section 2.4.2.2, *Cumulative Projects*, are anticipated to introduce additional pavement, lighting, signage, traffic signals, ramp metering systems, soundwalls, retaining walls, bridge widening, and interchange ramps, as well as remove trees and vegetation along I-680 (Haygood & Associates, 2022). This includes:

- Alameda I-680 Roadway Rehabilitation Project (04-0J620)
- Contra Costa Transportation Authority (CCTA) Coordinated Adaptive Ramp Metering Project (04-0Q960)
- Civil Infrastructure for Open Road Tolling (ORT) Conversion (04-2W520)
- I-680 Express Lanes Project, Sunol to Alcosta Boulevard in San Ramon (04-0Q3000; 4 miles south of the Project)
- I-680 Ramp Metering (04-1Q720K)
- Northbound SR-242 Rehabilitation Project Concord (04-26980)
- I-680/SR-4 Interchange Improvement Project (04-22914)

None of the Build Alternatives would directly impact the scenic resources mentioned above. However, all Build Alternatives would introduce new visual elements on I-680, including high-occupancy vehicle (HOV)/express lane signs, trestle gantries, and lights; additional pavement along the median and outside edges for the new HOV/express lanes; new retaining walls and (potentially) sound walls; bridge widening at the Rudgear Road Undercrossing (Alternatives 1C, 2, and 3); reconstruction of the Olympic Boulevard off-ramp (Alternatives 1C and 3); new Eastbound SR-24 Connector Undercrossing (Alternatives 1C and 3); new Mount Diablo Boulevard Undercrossing (Alternatives 1C and 3); new Lawrence Way Northbound On-ramp Undercrossing (Alternatives 2, 3, and 5); widening of the Contra Costa Canal Undercrossing (Alternatives 2, 3, and 5); and column modification on the Ygnacio Valley Road off-ramp (Alternatives 1C and 3).

Caltrans and the Federal Highway Administration (FHWA) mandate that a qualitative/aesthetic approach should be taken to address visual quality loss in a project area. This approach fulfills the letter and the spirit of FHWA requirements because it addresses and minimizes the actual cumulative loss of visual quality due to a project. In addition, measures would be implemented that would further minimize or avoid adverse impacts on visual/aesthetic resources, as described in Section 2.1.9, *Visual/Aesthetics*.

Therefore, the Project would not result in a cumulatively considerable adverse effect on visual/aesthetic resources, because it would blend in with elements already existing along the I-680 corridor and would be consistent with existing roadway features. Additionally, Project construction activities would be temporary, and the implementation of project measures would further reduce any adverse effect on the Project area's scenic views.

Air Quality

An analysis of the regional emissions resulting from the Build Alternatives was conducted using CTEMFAC2017 (Version 1.0.2), regional traffic projections, and network speeds provided via the CCTA travel demand model to compute an emission "burden" (Illingworth & Rodkin, Inc., 2024). The analysis, presented in Section 2.2.6, *Air Quality*, includes the Project's cumulative and indirect travel demand impacts and shows that Build Alternatives 1C, 2, and 3 would have comparable vehicle miles traveled (VMT)—less than 0.1 percent difference—to the No-Build Alternative and lower emissions than the existing conditions. Build Alternative 5 would have almost the same VMT (i.e., less than 0.01 percent difference) and lower emissions than existing conditions.

The carbon monoxide (CO) qualitative assessment and mobile source air toxics (MSAT) quantitative assessment can be considered indirect effect analyses because they look at air quality impacts (attributable to the Project) that could occur at a time in the future. Those assessments indicate that the potential for indirect effects associated with the Project would not be considerable. They demonstrate that in the future: (1) air quality impacts from CO would not cause or contribute to violations of the CO National Ambient Air Quality Standards (NAAQS); and (2) MSAT emissions from Build Alternatives 1C, 2, and 3 would be similar (i.e., less than 0.1 percent difference) to the No-Build Alternative and lower than existing conditions. Alternative 5 is similar to the No-Build Alternative also but would slightly increase MSAT emissions (by approximately 1 percent, on average).

Ozone (O_3) and secondary particulate matter are regional, cumulative issues because they are formed by photochemical and chemical reactions over time in the atmosphere, unlike primary sources of particulate matter that emit pollutants directly into the airshed. The Final EIR for *Plan Bay Area 2050* (Metropolitan Transportation Commission, 2021) and the *Bay Area 2017 Clean Air Plan* (Bay Area Air Quality Management District, 2017) address the regional and cumulative impacts from growth and transportation in the airshed, which include impacts from regional pollutants from existing transportation infrastructure. Alternative 2 was selected as the preferred alternative, and the final determination on project-level conformity is included in Appendix F, *Consultation and Coordination*.

The regional emissions analyses are based on a calibrated and validated regional travel demand model that estimated the cumulative and indirect impacts to the region. Likewise, this analysis used the CCTA travel demand model to estimate the cumulative and indirect impacts associated with the No-Build and Build Alternatives. In addition,

project construction would be temporary, and the implementation of project measures would further reduce any adverse effect on the Project area's air quality. Construction emissions are expected to be offset by emissions reductions during project operation. Therefore, the Project would not result in a cumulatively considerable adverse effect on air quality.

Greenhouse Gas Emissions

Under Executive Order (EO) 13990, CEQ issued *National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change*, which provided interim guidance to assist agencies in analyzing greenhouse gas (GHG) emissions and the climate change effects of their proposed actions under NEPA, on January 9, 2023. EO 14154, *Unleashing American Energy*, revoked EO 13990 on January 20, 2025.

An analysis of project-generated GHG emissions is required under CEQA. This includes an additional analysis of GHG emissions as a cumulative impact due to the global nature of climate change (Pub. Resources Code, Section 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 project's incremental impacts 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 GHG must necessarily be found to contribute to a significant cumulative impact on the environment. For further discussion of the Project's GHG emissions, please see Section 3.2.8, *Greenhouse Gas Emissions*, and Section 3.4, *Climate Change*.

Biological Resources

Potential cumulative impacts associated with the proposed Project have been evaluated with other nearby, past, present, and proposed transportation and non-transportation projects in Contra Costa and Alameda Counties (HDR Engineering, Inc., 2023b). Projects and actions in the vicinity of the proposed Project may collectively produce impacts that require consideration as a whole.

There are several highway projects planned or completed in the I-680 corridor, which include:

- **I-680/SR-4 Interchange Improvement Project**. This project proposes to construct improvements at the I-680/SR-4 interchange. Informal consultation was completed with the U.S. Fish and Wildlife Service (USFWS) regarding potential impacts on the California red-legged frog (*Rana draytonii*). USFWS concurrence was received with the conclusion that the project would not likely adversely affect the frog (Caltrans 2008).

- **SR-4 Operational Improvements (I-680 to Bailey Road)**. The SR-4 Operational Improvements Project includes a continuation of an HOV lane on eastbound SR-4 from the Northbound I-680 on-ramp to the start of the existing HOV lane just east of SR-242, as well as the addition of several sections of mixed flow lanes on eastbound and westbound SR-4, between SR-242 and Bailey Road.

- **Iron Horse Trail Pedestrian Overcrossing Project**. The City of San Ramon, in cooperation with CCTA and Caltrans, constructed a pedestrian and cyclist overcrossing along the existing Iron Horse Trail alignment at Bollinger Canyon Road. The project will improve safety and air quality by reducing at-grade crossing conflicts between pedestrians, cyclists, and motorists and improve motor vehicle traffic by reducing idling at the intersection. The overcrossing consists of a cable-stayed main span with a central support and removed the left turn lane on the side of Bollinger Canyon Road where the trail crossing is located. The Iron Horse Trail Bicycle and Pedestrian Overcrossing at Bollinger Canyon Road officially opened to the public on Saturday, July 19, 2025. (City of San Ramon, 2025)

Several land development projects are also planned in proximity to the Biological Study Area (BSA), including:

- **Bayview Residential Project**. This project proposes 144 single-family homes and associated internal roadways on an approximately 78-acre project site in the Vine Hill/Pacheco Boulevard area. The project also proposes four open space parcels, one of which is proposed as a park. The project site contains potential aquatic habitat for California red-legged frog. Measures are proposed to reduce potential impacts on California red-legged frog to a less-than-significant level.

- **Oak Road Townhouse Condominiums**. This 5.94-acre project site consists of eight parcels and is located at 2740 Jones Road, southeast of the I-680 and Treat Boulevard Intersection, within unincorporated Contra Costa County and adjacent to the city of Walnut Creek. This project will have no effect on California red-legged frog.

- **Tassajara Parks Housing Development**. This project would consist of the construction of 125 single-family homes with substantial park, recreation, and open space components in the Tassajara Valley area of unincorporated Contra Costa County. This project area is within designated critical habitat for California red-legged frog and Alameda whipsnake. There is no aquatic breeding habitat for California red-legged frog in the proposed project area, but there is potential upland migration/dispersal and over-summering habitat for California red-legged frog. The applicant will enter Section 7 consultation with USFWS and is proposing to mitigate for project-related impacts on this habitat at a 3:1 ratio.

All of the projects above went through, or are required to undergo, an environmental review to identify and account for or mitigate potential adverse effects. Those projects will preserve on-site upland habitat and restore affected on-site aquatic habitat. In the case of the Tassajara Parks Housing Development project, the applicant is proposing to mitigate off-site for project-related impacts on California red-legged frog habitat at a 3:1 ratio. Minimization and mitigation measures required for those projects and measures required for this proposed Project would ensure no cumulative impacts occur on biological resources. Therefore, the Project would not result in a cumulatively considerable adverse effect on biological resources.

Transportation

As described in Section 2.1.8, *Traffic and Transportation/Pedestrian and Bicycle Facilities*, all Build Alternatives would result in operational improvements on northbound I-680. The travel demand models used to analyze the Project's effectiveness estimated the cumulative and indirect impacts on the corridor. Implementation of the proposed Project, together with the other transportation projects associated with INNOVATE 680, would accommodate future traffic demand during peak periods, resulting in the reduction of traffic congestion conditions at various segments and interchanges. Transportation projects associated with INNOVATE 680 include part-time transit lanes, mobility as a service, automated driving systems, and advanced technologies and would provide alternative transportation modes, thereby resulting in additional beneficial congestion impacts. For all Build Alternatives, the impacts on circulation and access systems are beneficial on a cumulative basis under NEPA. (HDR Engineering, Inc., 2023a)

However, for transportation impacts under CEQA, Caltrans' guidance defines a cumulative impact as a "project's potential, when combined with other projects in an area or region, to significantly increase VMT" (California Department of Transportation, 2025). As described in Section 3.2.17, *Transportation*, Alternatives 1C, 2, and 3 would result in a significant cumulative impact on transportation, because when combined with other past, current, and probable future projects in the region, each of these alternatives would increase VMT within the metropolitan statistical area. Alternative 5 would not induce capacity and was screened from VMT analysis and mitigation. Although mitigation measures are proposed to reduce VMT under Alternatives 1C, 2, and 3, Caltrans has determined that the impact would remain significant and unavoidable. Therefore, Alternatives 1C, 2, and 3 would result in a cumulatively considerable impact on transportation under CEQA. These impacts are discussed further in Section 3.2.17, *Transportation*.

Chapter 3 California Environmental Quality Act Evaluation

3.1 DETERMINING SIGNIFICANCE UNDER CEQA

The proposed Project is a joint project by the California Department of Transportation (Caltrans or Department) and the Federal Highway Administration (FHWA) and is subject to State and federal environmental review requirements. Project documentation, therefore, has been prepared in compliance with both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (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 United States Code Section 327 (23 USC 327) and the Memorandum of Understanding dated May 27, 2022, 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. Each and every significant effect on the environment must be disclosed in the EIR and mitigated if feasible. In addition, the CEQA Guidelines list number of "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.

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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 California Environmental Quality Act (CEQA), not National Environmental Policy Act (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 Best Management Practices (BMP) 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; see Chapters 1 and 2 for a detailed discussion of these features. The annotations to this checklist are summaries of information contained in Chapter 2 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. This checklist incorporates by reference the information contained in Chapters 1 and 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?	☐	☐	☒	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☒	☐
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from a publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

3.2.1.1 CEQA Significance Determinations for Aesthetics

a–c) <u>Less Than Significant Impact</u>

As discussed in Section 2.1.9, *Visual/Aesthetics*, Interstate (I-680) is an Officially Designated State Scenic Highway between State Route (SR) 24 in Walnut Creek and Mission Boulevard in Fremont. Sections of I-680 are also Classified Landscaped Freeway in Contra Costa County. The Project Study Limits are in a valley surrounded on all sides by mountains and ridges, including Mount Diablo, Trampas Ridge, Keller Ridge, Briones Hills, and Apperson and Wauhab Ridges. Mount Diablo and its foothills are considered the most scenic visual resource in the region. Scenic vistas of mountains and ridges to the south and north are the most available to motorists, regardless of traffic congestion. Scenic vistas to the east and west are available to varying degrees depending on speed travel and congestion. Viewer sensitivity is considered high.

Proposed toll gantries, overhead express lane signs, lights in the medians, retaining walls, soundwalls, and vegetation removal would affect views of scenic vistas. Other Project features, such as equipment cabinets, BMP areas, maintenance vehicle

pullouts, California Highway Patrol (CHP) enforcement areas, and concrete barriers within State right-of-way (ROW), would not impact views of scenic vistas significantly.

Proposed project improvements are depicted in the visual simulations for Key View 1 through Key View 7 in Section 2.1.9, *Visual/Aesthetics*. The Project would not affect distant scenic resources, such as mountains and ridges, or damage any rock outcroppings or historic buildings. Screening trees and vegetation would be removed and not replaced in restricted areas between the edges of the highway and proposed soundwalls and retaining walls. Grassy slopes at the edge of the highway would be replaced with retaining walls at cut slopes where highway widening is proposed.

Motorists on I-680 would see project signs overlapping views of Mount Diablo and the foothills and ridges to the south. The new high-occupancy vehicle (HOV)/express lane signs that the project would add to I-680 in the Project Study Limits are standard throughout the San Francisco Bay Area, with overhead roadway signs currently installed within the Project Study Limits on southbound I-680. Intrusion on views would be short in duration for motorists passing each sign, and the signs would not completely obstruct views of the surrounding and distant hills and landforms. For motorists, the repeated visual intrusion caused by the proposed HOV/express lane signs may affect but would not substantially damage views of distant scenic resources.

In addition to the standard measures for highway planting and aesthetics described in Section 1.4.1.6, *Standardized Project Measures*, and the replacement planting and revegetation requirements described in Section 2.3.1, *Natural Communities*, Measures **VIS-1** through **VIS-5** would be implemented to avoid or minimize impacts on visual resources. Measures **VIS-1** and **VIS-2** would minimize vegetation removal and disturbance. As described in Section 1.4.1.6, *Standardized Project Measures*, concrete surface textures proposed for retaining walls and soundwalls would be designed to match existing walls and be consistent with the *I-680-24 Interchange Architectural Visual Design Guidelines*. Measure **VIS-5** would further require that new overhead sign structures, gantries, variable toll message signs (VTMS), and lights be similar to the existing design and color treatments on structures and poles. Measure **VIS-4** would also require the implementation of aesthetic treatments on walls and barriers. As such, the Project would not have a substantially adverse effect on a scenic vista. The Project also would not diminish the views that make the highway eligible for scenic status or substantially damage scenic resources on the State scenic highway. The impact would be less than significant. Mitigation is not required.

d) <u>Less Than Significant Impact</u>

All Build Alternatives would add light and glare to the existing environment. Highway lights, illuminated signs, and signs with reflective surfaces would affect residents in neighborhoods adjacent to the highway with direct views of a sign's surface and lighted messages. As described in Section 2.1.9, *Visual/Aesthetics*, visual impacts to those affected residents would be moderately high to high. However, I-680 is an existing highway corridor with lighting and signage. Measure **VIS-4** would require that the construction contractor limit all construction lighting to within the work area and avoid

light trespass through the use of directional lighting and shielding as needed. Safety lighting would be shielded to avoid light spillover and glare in locations where residential areas or other sensitive resources are adjacent to I-680. The Project has also been designed to avoid permanent lighting adjacent to the McNabney Marsh near Martinez. Measure **BIO-GEN-13** would require that all permanent lighting be designed to limit light pollution, which would include shielding and restricting added light to the roadways. In addition, the brightness of changeable messages on VTMS signs can be adjusted based on ambient light levels to avoid excessive light and glare. The Project would not create a new source of substantial light or glare that would adversely affect day or nighttime views in the area. The impact would be less than significant. Mitigation is not required.

3.2.2 Agriculture and Forest Resources

In determining whether impacts on 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 on 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 (CARB).

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?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒

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))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

3.2.2.1 CEQA Significance Determinations for Agriculture and Forest Resources

a–e) No Impact

According to the California Department of Conservation's California Important Farmland Finder (California Department of Conservation, 2022), none of the lands within the Project Study Limits are designated as important farmland (i.e., prime farmland, unique farmland, or farmland of statewide or local importance), forest land, or timberland. The lands within and immediately adjacent to the Project Study Limits consist primarily of Urban and Built-up Land. The California Department of Conservation does identify unique farmland south of the Project Study Limits, directly west of the Fostoria Way and Camino Ramon Intersection in the town of Danville (California Department of Conservation, 2022). In addition, the Sugarloaf Open Space Recreation Area, which is approximately 2 miles south of the I-680/SR-24 Interchange, and several unincorporated parcels adjacent to I-680, north of SR-4, are designated as grazing land (California Department of Conservation, 2022). However, most of the proposed Project improvements would be within State ROW. Most of the ROW that would be acquired for the Project would be in the vicinity of the I-680/SR-24 Interchange. Further, no parcels within the Project Study Limits are known to be under a Williamson Act contract (Contra Costa County Department of Conservation and Development, 2016). The proposed Project would not directly or indirectly convert farmlands, forestlands, or timberlands to nonagricultural, non-forest or non-timberland uses. There would be no impact.

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.

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non- attainment under an applicable federal or state ambient air quality standard?	☐	☐	☒	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☐	☒

3.2.3.1 CEQA Significance Determinations for Air Quality

a) No Impact

Alternatives 1C, 2, and 3 would add freeway capacity to northbound I-680, while Alternative 5 would reduce northbound I-680's capacity. The Metropolitan Transportation Commission (MTC) approved the 2023 Transportation Improvement Program (TIP) and Transportation-Air Quality Conformity Analysis for *Plan Bay Area 2050* and the 2023 TIP on September 28, 2022. The proposed Project is included as project TIP ID CC-170017 (I-680 NB Express Lane Completion) and Regional Transportation Plan (RTP) ID 21-T12-116. MTC forwarded the 2023 TIP to Caltrans to be included in the 2023 Federal-Statewide Transportation Improvement Program (FSTIP) by reference. The State approved the 2025 FSTIP on November 15, 2024. The Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) approved the 2025 FSTIP in December 2024.

The Project's design concept and scope under Alternative 2 (preferred alternative) has been determined to be in conformity with Plan Bay Area 2050 and the TIP. The final determination on project-level conformity is included in Appendix F, *Consultation and Coordination*. Implementation of the proposed Project would not interfere with timely implementation of Transportation Control Measures identified in the applicable state

implementation plan (SIP), which is the Bay Area Air Quality Management District's (BAAQMD) *2017 Clean Air Plan* (Bay Area Air Quality Management District, 2017). There would be no impact.

b) Less Than Significant Impact

As described in Section 2.2.6, *Air Quality*, the Project Study Limits are located in an area that is in nonattainment with California Ambient Air Quality Standards (CAAQS) for ozone (O_3) and particulate matter (PM_{10} and $PM_{2.5}$). The Air Basin is also in nonattainment with National Ambient Air Quality Standards for O_3 and $PM_{2.5}$, and Unclassifiable/Attainment for PM_{10}, carbon monoxide (CO), nitrogen dioxide (NO_2) and sulfur dioxide (SO_2). During construction, the Build Alternatives would generate air pollutant emissions from the use of construction equipment and vehicles powered by gas and diesel, as well as dust from earthmoving activities, such as trenching and grading. Table 2.2.6-6 in Section 2.2.6, *Air Quality*, shows the total estimated construction-related criteria air pollutants for the Build Alternatives. There would be temporary increases in criteria pollutants during construction, but the impact would be reduced due to the limited, short-term duration of construction (2 years) and the implementation of Measures **AQ-1** through **AQ-6,** as described in Section 2.2.6, *Air Quality*.

During operations, each Build Alternative would result in similar criteria air pollutant emissions compared to the No-Build Alternative due to slight changes in vehicle miles traveled (VMT), as depicted in Table 2.2.6-7 in Section 2.2.6, *Air Quality*. Criteria air pollutant emissions from Project operations were estimated comparing the existing baseline conditions (2020), the proposed Project's Opening Year (2027), Design Year (2047), and RTP Horizon year (2050) for all Build Alternatives and the No-Build Alternative. All Build Alternatives would have substantially lower operational emissions for O_3 precursors (reactive organic gas [ROG] and NO_x) and CO in the Opening, Design, and Horizon years when compared to existing baseline conditions as older vehicles are replaced by newer vehicles with more stringent emissions and fuel economy standards. However, all Build Alternatives would result in slightly higher particulate matter emissions ($PM_{2.5}$ and PM_{10}) compared to baseline emissions due to unmitigated VMT increases in the Design Year and Horizon Year.

MTC's Air Quality Conformity Task Force determined through interagency consultation that Alternatives 1C, 2, and 3 would not be a project of air quality concern, as described in 40 CFR 93.123(b)(1)(i) on April 1, 2022. Alternative 5 was subsequently added to the proposed Project. The Task Force determined that Alternative 5 would not be a project of air quality concern in February 2023. Therefore, the proposed Project is not subject to $PM_{2.5}$ project level conformity requirements, emissions analysis, or hot-spot analysis. The Task Force's concurrences are provided in Appendix F, *Consultation and Coordination*.

For these reasons, the proposed Project would not result in a cumulatively considerable net increase of any criteria pollutant. The impact would be less than significant. Mitigation is not required.

c) Less Than Significant Impact

Sensitive receptors are children, the elderly, people with asthma, and others who are at a heightened risk of negative health outcomes due to exposure to air pollution. Sensitive receptors are typically associated with schools, residential dwellings, daycare centers, hospitals, and senior-care facilities.

The Project Study Limits traverse several small cities and towns located within the East Bay area, including San Ramon, Danville, Concord, Pleasant Hill, Walnut Creek, Martinez and unincorporated areas of Contra Costa County (Community of Alamo). As a result, most of the land adjacent to northbound I-680 provides space for commercial/retail, residential, and light industrial uses. I-680 is adjacent to heavy industrial land uses near the Benicia-Martinez Bridge Toll Plaza. The zone of greatest concern near roadways is within 500 feet (150 meters) (Illingworth & Rodkin, Inc., 2024). Due to the corridor's length (i.e., approximately 20 miles), there are a large number of sensitive receptors within 500 feet of the Project Study Limits, which includes schools, daycares, hospital, senior/assisted living facilities, parks, and residential areas.

During construction, short-term air quality degradation may occur due to the release of particulate emissions (airborne dust) generated by excavation, grading, hauling, and other construction-related activities. Emissions from construction equipment are also expected and would include CO, NO_x, volatile organic compounds (VOC), directly emitted particulate matter (PM_{10} and $PM_{2.5}$), and toxic air contaminants, such as diesel exhaust particulate matter. Construction activities in the area may temporarily increase traffic congestion and slow the speed of traffic, resulting in a temporary increase in on-road emissions. These emissions would be limited to the immediate area impacted by construction-related traffic. Most of the construction emissions would be short-term in duration and would be spread out across the length of the I-680 corridor. In addition, Caltrans Standard Specifications and Measures **AQ-1** through **AQ-7** would be implemented as described in Section 2.2.6, *Air Quality*. Caltrans Specification Section 14-9-02 specifically requires that the construction contractor comply with all applicable laws and regulations related to air quality, including air pollution control district and air quality management district regulations and local ordinances.

As described in Section 2.2.6, *Air Quality*, unmitigated operational emissions in the Design Year (2047) and Horizon Year (2050) would be lower for O_3 precursors and CO and higher for particulate matter emissions due to increases in VMT compared to baseline conditions. Mobile source air toxics (MSAT) emissions would be lower than baseline conditions in the Opening, Design, and Horizon Years for all alternatives because of the U.S. Environmental Protection Agency's (EPA) national control programs that are projected to reduce annual MSAT emissions by over 76 percent between 2020 and 2060. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the U.S. EPA-projected reductions is so great (even after accounting for VMT associated with planned growth) that MSAT emissions in the region would be 46 to 70 percent lower in the future for both the No-Build and Build Alternatives. The impact would be less than significant. Mitigation is not required.

d) No Impact

The proposed Project would not introduce odors that are not already associated with existing traffic. There would be no impact.

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?	☐	☐	☒	☐
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?	☐	☒	☐	☐
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐
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?	☐	☐	☐	☒

3.2.4.1 CEQA Significance Determinations for Biological Resources

a) Less Than Significant Impact

All Build Alternatives have the potential to affect special-status plant and animal species, including California Endangered Species Act (CESA) and Federal Endangered Species Act (FESA) listed species and their habitats. The species, impact, and avoidance, minimization, and/or mitigation measures are summarized below and described in further detail in Section 2.3, *Biological Environment*.

Special Status Plant Species

The Project may impact suitable habitat for the Congdon's tarplant. As described in Section 2.3.3, *Plant Species*, the Project would not impact any other sensitive plant species or habitat. Congdon's tarplant was not observed during field surveys.

All Build Alternatives would implement the standard measures described in Section 1.4.1.6, *Standardized Project Measures*; Measures **BIO-GEN-1** through **BIO-GEN-16**, which are described in Section 2.3.1, *Natural Communities*; and Measure **BIO-PLANTS-1**, which is described in Section 2.3.3, *Plant Species*. **BIO-PLANTS-1** requires surveying and avoiding Congdon's tarplant and other rare plants if discovered prior to construction. Given the lack of potential for special-status plant species to occur in the Biological Study Area (BSA), there would be no impact on special-status plant species.

Special-Status Animal Species

As described in Section 2.3.4, *Animal Species*, the obscure bumble bee, Bridges' coast range shoulderband, coast horned lizard, nesting raptors and other birds, special-status bat species, San Francisco dusky-footed woodrat, and American badger have the potential to occur within the BSA.

All Build Alternatives would remove suitable habitat for special-status animal species. However, most of the BSA is developed and the majority of construction activities would occur within State ROW. Construction activities also have the potential to directly and indirectly impact special-status animal species (e.g., noise, fugitive dust, and lighting). All Build Alternatives would implement the standard measures described in Section 1.4.1.6, *Standardized Project Measures*; Measures **BIO-GEN-1** through **BIO-GEN-16**, which are described in Section 2.3.1, *Natural Communities*; and the measures described below, which can be found in Section 2.3.4, *Animal Species*. The Project would not result in a substantial adverse effect on any special-status species or their habitat. The impact on special-status animal species would be less than significant. Mitigation is not required.

- *Obscure Bumble Bee*: Obscure bumble bee has the potential to occur in the BSA. Alternatives 1C, 2, 3, and 5 would permanently impact up to 1.73 acres of brome grassland, which is potentially suitable habitat for obscure bumble

bee. Measure **BIO-BEE-1** would be implemented requiring a preconstruction bumble bee nest survey to confirm that the species is not in construction areas prior to construction.

- *Bridges' Coast Range Shoulderband*: All Build Alternatives would impact up to approximately 1.73 acres of brome grassland and a combined total of 1.53 acres of non-native woodland and semi-natural ornamental habitats, and Alternatives 1C, 2, and 3 would impact up to approximately 0.16 acre of coast live oak woodland, which are potentially suitable habitats for the species. Alternative 5 would not impact coast live oak woodland. Measure **BIO-SNAIL-1** would be implemented requiring preconstruction surveys to confirm that the species is not in construction areas.

- *Coast Horned Lizard*: Alternatives 1C, 2, and 3 would impact up to approximately 0.16 acre of coast live oak woodland, which is potentially suitable habitat for coast horned lizard. Alternative 5 would not impact coast live oak woodland. Measure **BIO-LIZARD-1** would be implemented requiring preconstruction surveys to confirm that the species is not in construction areas.

- *Nesting Raptors and other Nesting Birds*: Several raptors, including Cooper's hawk, white-tailed kite, and American peregrine falcon may nest in the BSA, and other special-status birds have the potential to nest or forage in the BSA. Caltrans Standard Specifications require the avoidance of dead or injured migratory birds and their nests. Measure **BIO-GEN-4** would be implemented, requiring nesting bird surveys to be completed prior to construction activities taking place during the nesting bird season (February 1 through August 31). In addition, Measures **BIO-HAWK-1**, **BIO-KITE-1**, **and BIO-FALCON-1** would be implemented to provide appropriate protection for any special-status bird species' nests discovered.

- *Special-Status Bat Species*: The following five special-status bat species have the potential to occur (to forage, roost, or breed) within the BSA: pallid bat Townsend's big-eared bat, Yuma myotis, Western red bat, and hoary bat. The proposed Project could impact roosting bats during tree removal. Construction noise or lighting could also disrupt roosting sites. Measures **BIO-BAT-1** and **BIO-BAT-2**, which would require preconstruction surveys and avoidance of roosts, if found.

- *San Francisco Dusky-Footed Woodrat*: Alternatives 1C, 2, and 3 would impact up to approximately 0.16 acre of coast live oak woodland, which is potentially suitable habitat for the species. Alternative 5 would not impact coast live oak woodland. Measures **BIO-WOODRAT-1** and **BIO-WOODRAT-2** would require preconstruction surveys and nest relocations if the woodrat is discovered, respectively.

- *American badger*: All Build Alternatives would impact up to 1.73 acres of brome grassland and Build Alternatives 1C, 2, and 3 would impact up to approximately 0.16 acre of coast live oak woodland, which are potentially suitable habitats for the species. Alternative 5 would not impact coast live oak woodland. Measure **BIO-BADGER-1** would be implemented and require preconstruction surveys and burrow mapping to confirm that the species is not in construction areas.

Threatened and Endangered Species

As discussed in Section 2.3.5, *Threatened and Endangered Species*, the following FESA-listed (i.e., proposed, endangered, or threatened) and CESA-listed (candidate, threatened, or endangered) species have the potential to occur in the BSA: Crotch's bumble bee, western bumble bee, California red-legged frog, Alameda whipsnake, California black rail, California Ridgway's rail, salt-marsh harvest mouse, and western burrowing owl. The Project Study Limits do not overlap any designated critical habitat.

Construction activities have the potential to directly and indirectly impact listed species (e.g., noise, fugitive dust, and lighting). However, most of the BSA is developed and the majority of construction activities would occur within State ROW. All Build Alternatives would implement the standard measures described in Section 1.4.1.6, *Standardized Project Measures*; Measures **BIO-GEN-1** through **BIO-GEN-16**, which are described in Section 2.3.1, *Natural Communities*; and the measures described below, which can be found in Section 2.3.5, *Threatened and Endangered Species*. In addition, Measure **VIS-4** would require the preparation of a lighting plan during final design. Environmentally sensitive areas are required to be protected in the lighting plan per Chapter 205 of the Caltrans Traffic Operations Manual.

The Project would not result in a substantial adverse effect on any federally listed (proposed, threatened, or endangered) or State-listed (candidate, threatened, or endangered) species or their habitat. The impact on threatened and endangered species would be less than significant. Mitigation is not required.

- *Crotch's Bumble Bee and Western Bumble Bee*: Brome grassland, non-native woodland, semi-natural ornamental habitats, and coast live oak woodland are potentially suitable habitat for Crotch's and western bumble bees. All Build Alternatives are expected to impact up to 1.73 acres of brome grassland and a combined total of 1.53 acres of non-native woodland and semi-natural ornamental habitats. Alternatives 1C, 2, and 3 are expected to impact up to approximately 0.16 acre of coast live oak woodland. Alternative 5 would not impact coast live oak woodland or non-native woodland habitats. Measure **BIO-BEE-1** would be implemented requiring pre-construction surveys to be performed, and any bumble bee nests found to be mapped, flagged, and avoided.

- *Monarch Butterfly*: While there is potential for monarch to occur in the BSA, especially passing through during migration, it is not likely for the species to

overwinter in non-native woodland or semi-natural ornamental areas in the BSA because the BSA is situated several miles inland from the species' known overwintering range. Furthermore, no milkweed was observed in the BSA during field surveys, which monarchs depend on to complete their life cycle. It is likely that the species only transits through the BSA and does not breed or winter in the BSA. No species-specific measures are proposed.

- *California Red-Legged Frog*: The Contra Costa Canal and other creeks that cross I-680 could serve as potential dispersal habitat for California-red legged frogs. A USFWS-approved biological monitor(s) would monitor certain construction activities in or adjacent to California red-legged frog habitat (**BIO-GEN-1**). In addition, measures **BIO-FWS-1** through **BIO-FWS-4** would be implemented requiring preconstruction surveys, stopping work if a California red-legged frog is observed, stopping work during rain events, and the preparation of a post-construction report that would be submitted to USFWS, respectively.

- *Alameda Whipsnake*: Brome grassland and coast live oak woodland are potentially suitable habitat for Alameda whipsnake. All Build Alternatives are expected to impact up to approximately 1.73 acres of brome grassland. Alternatives 1C, 2, and 3 are expected to impact up to approximately 0.16 acre of coast live oak woodland. Alternative 5 would not impact coast live oak woodland. A USFWS-approved biological monitor(s) would monitor certain construction activities in or adjacent to Alameda whipsnake habitat (**BIO-GEN-1**). In addition, measures **BIO-FWS-1** through **BIO-FWS-4** would be implemented requiring preconstruction surveys, stopping work if an Alameda whipsnake is observed, stopping work during rain events, and the preparation of a post-construction report that would be submitted to USFWS, respectively.

- *Northwestern Pond Turtle*: All Build Alternatives would avoid habitat associated with McNabney Marsh. There is a low potential for the species to occur in San Ramon Creek at the Rudgear Road Undercrossing. Alternatives 1C, 2, and 3 include widening the Rudgear Road Undercrossing Bridge. Alternative 5 would not widen the Rudgear Road Undercrossing Bridge. At this location, San Ramon Creek is concrete-lined, and the surrounding ground is hardscaped. These conditions do not provide suitable nesting habitat for the species, but the species may use the creek for dispersal between areas of more suitable habitat. Falsework would be installed over San Ramon Creek preventing debris and other contaminants from entering the creek during construction. Measure **BIO-TURTLE-1** would be implemented requiring preconstruction surveys to confirm that the species is not in construction areas.

- *Western Burrowing Owl*: All Build Alternatives would permanently impact up to 1.73 acres of brome grassland, which is potentially suitable habitat for the species. Measure **BIO-OWL-1** would be implemented and require protocol

surveys to confirm that the species is not in construction areas. Burrow mapping and avoidance of the species would also occur if discovered.

- *California Black Rail, California Ridgway's Rail, and Salt-Marsh Harvest Mouse*: Suitable California black rail, California Ridgway's rail, and salt-marsh harvest mouse habitat occurs within the BSA at McNabney Marsh. However, no construction activities associated with the proposed Project are to occur north of post mile (PM) 23.1, which is situated approximately 1,000 feet south from the marsh habitat and separated from it by a housing development. The proposed Project would install luminaires in the highway median at this location. Light spread from the new luminaires would not reach the marsh habitat, and none of the noise associated with any of the construction activities at this location would exceed that of the baseline noise environment. Due to the distance between marsh habitat and the Project's impact areas, species-specific measures are not proposed for the California black rail, California Ridgway's rail, or salt-marsh harvest mouse.

b) Less Than Significant Impact with Mitigation Incorporated

As discussed in Section 2.3.1, *Natural Communities*, all Build Alternatives would have a similar impact on aquatic habitats and other sensitive natural communities. All Build Alternatives would impact approximately 1.73 acres of brome grassland and a combined total of 1.53 acres of non-native woodland and semi-natural ornamental habitats. Alternatives 1C, 2, and 3 would impact approximately 0.16 acre of coast live oak woodland. Alternative 5 would not impact coast live oak woodland. Construction activities for bridge widening would occur within the road prism on the elevated roadway spanning San Ramon Creek and the Contra Costa Canal. None of the Build Alternatives would disturb the concrete lined channels below these structures. The impact to wetlands, including riparian habitat, is included in response (c).

The Project would impact between 192 and 309 trees, of which 65 to 140 are native species. Alternative 5's footprint overlaps the least number of total trees and the least number of native trees, while Alternative 1C overlaps the lowest number of non-native trees. Alternative 2's footprint overlaps a greater number of total trees than Alternative 1C. However, seven fewer of those trees are native species compared to those mapped in Alternative 1C. Alternative 3's footprint overlaps the greatest number of trees because it represents the combined footprints of both Alternative 1C and Alternative 2. In accordance with Mitigation Measure **BIO-MM-1**, which is described in Section 2.3.1, *Natural Communities*, and Senate Concurrent Resolution No. 17: Oak Woodlands, native oak woodlands would be avoided to the maximum extent feasible. Oak trees that are impacted would be mitigated through replacement or compensatory mitigation. Replacement ratios would be determined in consultation with the California Department of Fish and Wildlife (CDFW) and based on the size of the tree removed, with large-diameter trees requiring greater replacement numbers than small trees. With implementation of Mitigation Measure **BIO-MM-1**, the Project would not result in a substantial adverse effect on any sensitive natural community. The impact would be less than significant with mitigation incorporated.

c) Less Than Significant Impact with Mitigation Incorporated

As discussed in Section 2.3.2, *Wetlands and Other Waters*, the proposed Project could impact up to approximately 0.26 acre of aquatic resources, which may fall within United State Army Corps of Engineering (USACE), Regional Water Quality Control Board, and/or CDFW jurisdiction. The Project Team received a preliminary jurisdictional determination from USACE as certain features do not appear to meet the definition of waters of the United States. Any loss of federally protected wetlands would be considered a potentially significant impact. Mitigation Measure **BIO-MM-2**, which is described in Section 2.3.2, *Wetlands and Other Waters*, would be implemented requiring the compensatory mitigation of wetlands and other waters at a ratio that would be determined in consultation with the permitting agencies during final design. It is assumed that the ratio would be a minimum of 1:1 at this time. The impact would be less than significant with mitigation incorporated.

d) Less Than Significant Impact

The Project would widen an existing highway. The Project is not anticipated to negatively impact wildlife movement between the west and east sides of I-680. None of the Build Alternatives would result in a substantial increase in impermeable surfaces or a substantial decrease in the vegetated ROW adjacent to the roadway. Temporarily impacted vegetation communities would be restored following construction activities. Due to physical barriers, none of the creeks within the BSA are currently used for fish passage or migration. The impact would be less than significant. Mitigation is not required.

e) Less Than Significant Impact

Certain trees are protected under the Walnut Creek Municipal Code and the Contra Costa County Tree Protection and Preservation Ordinance. As described in Section 2.3.1, *Natural Communities*, Caltrans is not subject to local tree ordinances for work done within State ROW. Tree permits may be required from the City of Walnut Creek or Contra Costa County for work outside State ROW. Therefore, the Project would not conflict with any local policies or ordinances protecting biological resources. The impact would be less than significant. Mitigation is not required.

f) No Impact

The Project would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan. There would be no impact.

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 pursuant to §15064.5?	☐	☐	☒	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☒	☐
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☐	☐	☒

3.2.5.1 CEQA Significance Determinations for Cultural Resources

a) Less Than Significant Impact

As detailed in Section 2.1.10, *Cultural Resources*, the APE for the Project overlaps five built historic resources (built environment) that are on or eligible for listing on the National Register and California Register. Archaeological resources are discussed in response (b). As described below, the Project would not cause a substantial adverse change in the significance of a historical resource. The impact would be less than significant. Mitigation is not required.

- *Southern Pacific Railroad Northern Contra Costa Route:* These railroad tracks cross through the APE adjacent to Waterfront Road/Marina Vista Avenue, near the Benicia-Martinez Bridge Toll Plaza. The Project does not include any construction activities or permanent improvements north of PM 23.1, which is over a mile from this resource.

- *Contra Costa Canal:* The canal crosses I-680 at the following three locations:

  - At PM 22.8, the canal is an underground pipe that crosses I-680 near Arthur Road. The Project could include the installation of utilities over the underground pipe, which would be confirmed during final design. This segment of the canal was built after the canal's period of significance.

  - At PM 21.9, the canal is an open, concrete-lined channel that is flanked by a dirt/gravel road that crosses under I-680. All Build Alternatives include installing utilities that would span the canal at this location. Utilities that cross the Contra Costa Canal at PM 21.9 will either be installed on

concrete piers beside the canal walls, similar to existing conduit at this location, or installed between the fence line and I-680 guardrail.

- At PM 16.1, the canal crosses under the Contra Costa Canal Undercrossing Bridge (No. 28 0135). Under the bridge, the canal features a control gate on the north sidewall and a concrete check that crosses the width of the canal. East of the bridge, the canal passes under Bay Area Rapid Transit (BART) tracks and Jones Road in a concrete box culvert supported on the north by a concrete-bag retaining wall. The Contra Costa Canal Trail/Briones to Mount Diablo Regional Trail is adjacent to the canal at this location. The canal's character-defining features within the APE include the concrete-lined open canal that follows the natural terrain to maintain a steady elevation. The control gate and check at PM 16.1 are considered character-defining features of the canal, while the culvert that passes under BART was built after the period of significance and does not contribute to the significance of the historic property.

Alternatives 2, 3, and 5 would widen the Contra Costa Canal Undercrossing Bridge 33 feet to the east of the existing structure. The bents and columns would follow the alignment of their counterpart features on the existing structure. No temporary or permanent physical alterations would occur to the segment of the canal that crosses under the Contra Costa Canal Undercrossing Bridge (No. 28 0135). Any temporary falsework that would be needed for bridge widening would completely span the historic boundary of the canal. Netting and other protective measures would be used to prevent items and materials from falling into the canal.

- *Mokelumne Aqueduct:* Three parallel pipelines cross beneath I-680 at the SR-242 Interchange. The aqueduct consists of three pipelines that are buried underground along the center of a 100-foot-wide corridor. Alternatives 1C, 2, and 3 propose adding pavement to the outside (east) shoulder of northbound I-680 where the freeway crosses over the Mokelumne Aqueduct. Proposed construction activities at this location would be no deeper than 4 feet and the pipelines are more than 15 feet below the freeway grade.

- *BART:* The transit service is along northbound I-680 near Treat Boulevard and Parkside Drive and then crosses I-680 north of SR-24 at the BART Central Contra Costa Line Interstate 680 Overpass. All Build Alternatives were designed to avoid physical destruction of or damage to all or part of BART, including its abutment and retaining wall on the west end of the BART Central Contra Costa Line Interstate 680 Overpass.

- *Contra Costa – Moraga Transmission Line:* All Build Alternatives would add a northbound lane within the existing Caltrans ROW and install a gantry toll reader within the vicinity of the transmission line. The transmission line tower base is approximately 100 feet above the freeway and the towers appear to

be at least 70 feet tall. As such, all proposed construction activities and permanent improvements would be well below this resource.

b) Less than Significant Impact

Based on the preliminary design, project components have been located to avoid known areas of potentially significant archaeological resources. It is Caltrans' policy to avoid cultural resources whenever possible. As discussed in Section 2.1.10, *Cultural Resources*, in addition to the standardize project measures described in Section 1.4.1.6, *Standardized Project Measures*, Measures **CUL-1** through **CUL-2** would be implemented in the event archaeological resources are discovered. Therefore, the impact would be less than significant. Mitigation is not required.

c) No Impact

There are no formal cemeteries or known burial sites in the Project area. Project construction is not expected to disturb any human remains. In accordance with **CUL-2**, as described in Section 2.1.10, *Cultural Resources,* the construction contractor would be required to comply with California Health and Safety Code Section 7050.5 and Caltrans Standard Specification 14-2, which require all work to stop within 60 feet of discovery of cultural resources, including human remains. If human remains are discovered, California Health and Safety Code Section 7050.5 states that further disturbances and activities shall stop in any area or nearby area suspected to overlie remains. The Caltrans Branch Chief of Archaeology shall be notified, and then the County Coroner contacted. If the remains are thought by the coroner to be Native American, the coroner will notify the Native American Heritage Commission (NAHC), who, pursuant to Public Resources Code (PRC) Section 5097.98, will then notify the Most Likely Descendent (MLD). At this time, the person who discovered the remains will contact the Branch Chief of Cultural Resources 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. There would be no impact.

3.2.6 Energy

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☒	☐

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☐	☒

3.2.6.1 CEQA Significance Determinations for Energy

a) Less Than Significant Impact

The proposed Project is a transportation improvement project that would improve operations along northbound I-680. As discussed in Section 2.2.8, *Energy*, the proposed Project's potential demand for energy that would exceed the current supply or cause a substantial increase in the rate of energy use was evaluated. Project construction and maintenance activities would result in a temporary commitment of energy, as would be necessary for any infrastructure improvement project. Construction vehicles and equipment operating on site, as well as trucks delivering equipment and supplies, would consume energy in the form of gas and diesel. With the implementation of Measures **E-1** through **E-3**, and the incorporation of the Standardized Project Measure regarding TMP preparation, temporary energy impacts associated with construction would be minimized to the maximum extent feasible. All Build Alternatives would result in a negligible change in energy use during construction. The Project was designed to reduce peak-period congestion and delay on northbound I-680, which could reduce energy consumption. The Project would not result in potentially significant environmental impacts due to wasteful, inefficient, or unnecessary consumption of energy resources, during construction or operation. The impact would be less than significant. Mitigation is not required.

b) No Impact

Reduced peak-period congestion and delay on northbound I-680 would occur under all Build Alternatives, which would reduce travel time and improve travel time reliability for corridor travelers. The Build Alternatives would also encourage use of HOV and transit services by optimizing the use of the existing managed lane capacity in the I-680 corridor, which would better meet current traffic demands and support future demand. All Build Alternatives would address existing transportation problems, such as congestion, lack of system continuity, and existing operational deficiencies, as well as reduce energy consumption within the proposed Project area, in compliance with all applicable federal, State, and local plans, policies, and regulations listed in Section 2.1.2, *Consistency with State, Regional, and Local Plans and Programs*, and Section 2.2.8, *Energy*. The proposed Project would not conflict with or obstruct State, regional, or local plans for renewable energy or energy efficiency. There would be no impact.

3.2.7 Geology and Soils

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☐	☒
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☒
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☐	☒
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☒	☐

3.2.7.1 CEQA Significance Determinations for Geology and Soils

a–e) No Impact

As described in Section 2.2.3, *Geology/Soils/Seismic/Topography*, Caltrans' design and construction guidelines incorporate engineering standards that address seismic risks. Project elements would be designed and constructed to meet seismic design requirements for ground shaking and ground motions, as determined for the project vicinity and site conditions. Caltrans also requires additional geotechnical subsurface and design investigations to be performed during the final project design and engineering phase, in accordance with Measure **GEO-1**. These standards and requirements would avoid the potential for an adverse impact on geological resources. In addition, the Project would not include the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater. There would be no impact.

f) Less Than Significant Impact

As described in Section 2.2.4, *Paleontology*, Project activities would encounter geologic units that are known to have high paleontological sensitivity. Caltrans Standard Specifications 14-7.03 would be implemented to provide for stopping work, securing the area, and performing further investigation if paleontological resources are encountered during project construction. Due to the potential for scientifically significant paleontological resources to be discovered in the Project area, Measure **PAL-1** would be implemented to avoid potential impacts to sensitive paleontological resources if discovered. The impact would be less than significant. Mitigation is not required.

3.2.8 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?	☐	☐	☒	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

3.2.8.1 CEQA Significance Determinations for Greenhouse Gas Emissions

a) Less than Significant Impact

Short-Term (Construction) Impacts

The Project would result in short-term greenhouse gas (GHG) emissions associated with construction activities, which would consist primarily of emissions from equipment exhaust and worker and vendor trips. Construction-related emissions for the proposed Project, under All Build Alternatives, are presented by construction stage in Table 3.2.8-1. The carbon dioxide equivalent (CO_2e) is represented in metric tons to express the impact of various GHGs in one singular number.

Table 3.2.8-1. Estimated CO_2e Emissions for Project Construction

	CO_2e
Average Workday Emissions (lbs/day) Based on 528 Workdays	4,820 MT/Year
Roadway Construction (tons)	5,637 MT
Structures Construction (tons)	4,003 MT
Total Construction (tons)	9,640 MT

Source: (Illingworth & Rodkin, Inc., 2024)
Notes: CO_2e = carbon dioxide equivalent, lbs/day = pounds per day, MT = metric ton

Construction activities are estimated to result in average daily emissions of approximately 4,820 metric tons of CO_2e per year based on a total of 528 workdays. As described in Section 2.2.6, *Air Quality*, Measures **AQ-1** through **AQ-7** would be implemented, which would further control construction emissions. Caltrans Standard Specification Section 14-9 specifically requires that the construction contractor comply with all applicable laws and regulations related to air quality, including air pollution control district and air quality management district regulations and local ordinances. Construction activities would not generate greenhouse gas emissions that may have a significant impact on the environment. The impact would be less than significant. Mitigation is not required.

Long-Term (Operational) Impacts

Alternatives 1C, 2, and 3 would enhance the capacity of northbound I-680, while Alternative 5 would reduce northbound I-680's capacity. As described in Section 3.4, *Climate Change*, operational GHG emissions for the No-Build and Build Alternatives were computed using CT-EMFAC2021 for the baseline year (2020), Opening Year (2027), Design Year (2047), and the RTP's horizon hear (2050) (Illingworth & Rodkin, Inc., 2024). Table 3.2.8-2 through Table 3.2.8-4 provide the estimated GHG emissions for the baseline year, Opening Year, Design Year, and Horizon year. For CEQA purposes, the difference in GHG emissions between the baseline year and the Design

Year must be compared. Projected GHG emissions for the Opening Year and Horizon year are included for additional comparison.

CO_2e emissions for the No-Build Alternative and Build Alternative and each analysis year were calculated by multiplying the total emissions (grams/day) of CO_2, methane (CH_4), nitrogen dioxide (N_2O), and hydrofluorocarbons (HFC) by their greenhouse warming potentials (GWP) then summing the emissions and changing the units into annual metric tons of CO_2e.

The changes in GHG and VMT vary by alternative and analysis year when compared to the baseline year (2020). Overall, all Build Alternatives would result in a decrease of GHG emissions compared to the 2020 baseline due to improvements in vehicle technology and fuel reformulation. Although GHG emissions for Alternatives 1C, 2, and 3 would be slightly higher compared to the No-Build Alternative in Design Year (2047), this is largely the result of a slight increase in VMT. Alternative 5 performs the best overall as it would decrease GHG emissions. Alternative 5 has an order of magnitude less VMT increase and still is able to reduce congestion (i.e., improve travel speeds), resulting in a decrease in estimated GHG emissions. However, Alternative 3 would have the lowest GHG emissions increase in the Opening Year (2027), while Alternative 2 has the smallest GHG emissions increase in the Design Year (2047) and RTP Horizon Year (2050) without mitigation.

As described further in Section 3.2.17, *Transportation*, measures would be implemented that would offset the proposed Project's VMT impact. The Project's long-term operational impact, under all Build Alternatives, would be less than significant. Mitigation is not required.

Table 3.2.8-2. Modeled CO_2e Emissions for the Proposed Project's Opening Year (2027)

	2020 Baseline	Opening Year (2027)				
		No-Build	Alt 1C	Alt 2	Alt 3	Alt 5
GHG Emissions (MT CO_2e/day)	40,441	36,079	36,110	36,112	36,103	35,647
GHG Emissions (MT CO_2e/year)	14,761,127	13,168,965	13,180,049	13,180,715	13,177,600	13,011,002
Difference Between Build and No-Build (MT CO_2e/day)	N/A	N/A	+30	+32	+24	-433
Difference Between Build and No-Build (MT CO_2e/year)		N/A	+11,084	+11,749	+8,634	-157,964
Change Between Alternative and Existing (MT CO_2e/day)	N/A	-4,362	-4,332	-4,330	-4,338	-4,795
Change Between Alternative and Existing (MT CO_2e/year)		-1,592,162	-1,581,079	-1,580,413	-1,583,528	-1,750,126
Daily Vehicle Miles Traveled	96,695,358	102,859,588*	102,922,450	102,916,580	102,925,286	102,859,588
Annual Vehicle Miles Traveled[1]	33,553,289,170	35,692,277,106	35,714,090,255	35,712,053,293	35,715,074,196	35,692,277,106

Source: (Illingworth & Rodkin, Inc., 2024)
Notes: GHG = greenhouse gas emissions, MT CO_2e/day = metric tons carbon dioxide equivalent per day, MT CO_2e/year = metric tons carbon dioxide equivalent per year, N/A = not applicable
[1] Annual vehicle miles traveled (VMT) values derived from Daily VMT values multiplied by 347, per CARB methodology.
* Daily VMT data was provided by Kittelson & Associates on February 16, 2022. Kittelson subsequently reduced the VMT for the No-Build Opening Year (2027) from 102,859,588 to 102,853,478 due to a correction in the workbook that was used for air quality analysis (see Section 3.2.17). For emission estimates, this difference would be statistically insignificant and would not change the findings in the Air Quality Report given the uncertainties of the travel demand model and emissions model or the CEQA determinations.

Table 3.2.8-3. Modeled CO2e Emissions for the Proposed Project's Design Year (2047)

	2020 Baseline	Design Year (2047)				
		No-Build	Alt 1C	Alt 2	Alt 3	Alt 5
GHG Emissions (MT CO_2e/day)	40,441	31,475	31,493	31,483	31,495	31,119
GHG Emissions (MT CO_2e/year)	14,761,127	11,488,202	11,494,827	11,491,448	11,495,633	11,358,537
Difference Between Build and No-Build (MT CO_2e/day)	N/A	N/A	+18	+9	+20	-355
Difference Between Build and No-Build (MT CO_2e/year)		N/A	+6,625	+3,247	+7,431	-129,665
Change Between Alternative and Existing (MT CO_2e/day)	N/A	-8,967	-8,949	-8,958	-8,947	-9,322
Change Between Alternative and Existing (MTCO_2e/year)		-3,272,926	-3,266,301	-3,269,679	-3,265,495	-3,402,591
Daily Vehicle Miles Traveled	96,695,358	115,101,953	115,204,075	115,186,351	115,204,937	115,115,425
Annual Vehicle Miles Traveled[1]	33,553,289,170	39,940,377,641	39,975,814,099	39,969,663,653	39,976,113,312	39,945,052,618

Source: (Illingworth & Rodkin, Inc., 2024)
Notes: GHG = greenhouse gas emissions, MT CO_2e/day = metric tons carbon dioxide equivalent per day, MT CO_2e/year = metric tons carbon dioxide equivalent per year, N/A = not applicable
[1] Annual vehicle miles traveled (VMT) values derived from Daily VMT values multiplied by 347, per CARB methodology.

Table 3.2.8-4. Modeled CO_2e Emissions for the Regional Transportation Plan's Horizon Year (2050)

	2020 Baseline	RTP Horizon Year (2050)				
		No-Build	Alt 1C	Alt 2	Alt 3	Alt 5
GHG Emissions (MT CO_2e /day)	40,441	31,793	31,813	31,803	31,813	31,516
GHG Emissions (MT CO_2e /year)	14,761,127	11,604,337	11,611,607	11,607,992	11,611,690	11,503,360
Difference Between Build and No-Build (MT CO_2e /day)	N/A	N/A	+20	+10	+20	-277
Difference Between Build and No-Build (MT CO_2e /year)		N/A	+7,270	+3,655	+7,353	-100,977
Change Between Alternative and Existing (MT CO_2e /day)	N/A	-8,649	-8,629	-8,639	-8,629	-8,925
Change Between Alternative and Existing (MT CO_2e /year)		-3,156,790	-3,149,520	-3,153,135	-3,149,437	-3,257,767
Daily Vehicle Miles Traveled	96,695,358	116,938,308	117,046,885	117,026,816	117,046,885	116,953,801
Annual Vehicle Miles Traveled[1]	33,553,289,170	40,577,592,721	40,615,072,676	40,608,305,207	40,615,269,179	40,582,968,945

Source: (Illingworth & Rodkin, Inc., 2024)
Notes: GHG = greenhouse gas emissions, MT CO_2e/day = metric tons carbon dioxide equivalent per day, MT CO_2e/year = metric tons carbon dioxide equivalent per year, N/A = not applicable
[1] Annual vehicle miles traveled (VMT) values derived from Daily VMT values multiplied by 347, per CARB methodology.

b) Less Than Significant Impact

The BAAQMD's Clean Air Plan, *Spare the Air, Cool the Climate* (2017), addresses GHGs in the proposed Project region. In addition, Contra Costa County has adopted a *Climate Action Plan*, which includes a qualified GHG reduction strategy (Contra Costa County, 2015a). The County's *Climate Action Plan* describes how the County will achieve Assembly Bill (AB) 32 GHG emissions reduction target of 15 percent below baseline levels by the year 2020 and lays the groundwork for long-term GHG control through 2035. The County is currently preparing an update to its *Climate Action Plan*.

The proposed Project would comply with all applicable local, State, and federal regulations, ordinances, and statutes regarding GHG emissions. The proposed Project would construct express lanes that would serve transit and encourage HOV and clean air vehicle (CAV) use. Therefore, the proposed Project would be consistent with Contra Costa County's *Climate Action Plan* as well as local climate action plans (e.g., cities of Walnut Creek, Martinez, Pleasanton, Dublin, and San Ramon) that encourage or prioritize transit ridership and alternatives to solo driving. All relevant regional plans pertaining to GHG emissions are described in Table 3.4.2-1 of Section 3.4, *Climate Change*.

The proposed Project would be consistent with Senate Bill (SB) 375 as it is included in the current RTP, *Plan Bay Area 2050* (Association of Bay Area Governments and Metropolitan Transportation Commission, 2021). Because GHG emissions for each Build Alternative would be lower for the Design Year (2047) compared to existing conditions (2020; see Table 3.2.8-3), the proposed Project would align with policies to keep the state on a trajectory for progress toward the Executive Order S-3-05 2050 emission reduction target and the more aggressive goal of carbon neutrality by 2045 set by AB 1279. Alternatives 1C, 2, and 3 would result in slightly higher GHG emissions compared to the No-Build Alternative for the Design Year, which is due to increases in daily VMT, while Build Alternative 5 would decrease GHG emissions. The impact would be less than significant. Mitigation is not required.

As described in Section 3.2.17, *Transportation*, a strategy would be implemented to offset the proposed Project's induced VMT that would encourage transit ridership within the County should either Alternative 1C, 2, or 3 be selected as the preferred alternative.

3.2.9 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?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☒	☐
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.	☐	☐	☒	☐

3.2.9.1 CEQA Significance Determinations for Hazards and Hazardous Materials

a, b, d) Less Than Significant Impact

As noted in Section 2.2.5, *Hazardous Waste/Materials*, project construction and maintenance activities are expected to involve the routine transport, use, and disposal of hazardous materials (e.g., fuels, paints, and lubricants) that could pose a significant threat to human health or the environment if not properly managed. Adherence to applicable federal, State, and local regulations and requirements during project construction and maintenance reduces the risk of exposure to hazardous materials and accidental hazardous materials releases. Compliance with applicable regulations is mandatory; therefore, proposed construction and maintenance activities are not expected to create a hazard to construction workers, the public, or the environment through the routine transport, use, disposal, or accidental release of hazardous materials.

The *Initial Site Assessment* for the Project revealed extensive historic agricultural, industrial, and urban development within the Project Study Limits (Parikh Consultants, Inc., 2022). Soils within the Project Study Limits possibly contain hazardous levels of various chemicals, including aerially deposited lead (ADL), pesticides, herbicides, and petroleum products and their derivatives. In addition, several historical and currently active railroads were located on or adjacent to the Project Study Limits and potential ROW acquisitions. There is also the potential for soil and groundwater contamination associated with railroad use, which includes polycyclic aromatic hydrocarbons (PAH), asbestos, heavy metals, herbicides, and pesticides. Due to the age of buildings and structures within the Project Study Limits, there is also the potential for asbestos containing material (ACM) and lead based paint (LBP) within the Project Study Limits. The *Initial Site Assessment* identified the 511 Lawrence Way and Jones Road sites as containing recognized environmental conditions that could potentially impact the Project (Parikh Consultants, Inc., 2022).

With selection of Alternative 2 as the preferred alternative, additional site investigations would be conducted of 511 Lawrence Way and Jones Road sites prior to ROW acquisition as described in Measure **HAZ-1**. In addition, measures would be implemented that require investigations for aerially deposited lead (**HAZ-2**), asbestos containing material and lead-based paint (**HAZ-3**), contaminants from agricultural land uses (**HAZ-4**), and contaminants from railroad land uses (**HAZ-5**), as described in Section 2.2.5, *Hazardous Waste/Materials*. Special soil, groundwater, and construction materials management and disposal procedures for hazardous materials, as well as construction worker health and safety measures may need to be implemented depending on the results of these investigations. Site-specific control measures would then be incorporated into the final project design, as is standard practice for Caltrans projects.

Therefore, Project construction is not expected to create a hazard to construction workers, the public, or the environment. Further, compliance with existing regulations is expected to limit the risk of a reasonably foreseeable upset or accident and minimize

the impact to the public and environment should an accident occur during construction or maintenance activities. The impact would be less than significant. Mitigation is not required.

c) Less Than Significant Impact

Although there are schools within 0.25 mile of the Project Study Limits, no construction activities would occur on or immediately adjacent to any school. In addition, compliance with Caltrans' standards and applicable federal, State, and local regulations is expected to reduce the risk of exposure to hazardous materials near schools. The impact would be less than significant. Mitigation is not required.

e) Less Than Significant Impact

Buchanan Field Airport is a public airport located adjacent to northbound I-680, northeast of the Concord Avenue Intersection. The Project Study Limits overlap the airport influence area identified in the *Contra Costa Airport Land Use Compatibility Plan* (Contra Costa County Airport Land Use Commission, 2000). A Master Plan was completed for the airfield in 1990, and a Federal Aviation Regulation (FAR) Part 150 Noise Exposure and Land Use Compatibility Study was completed in 1989. A Master Plan Update was completed in 2008 (Barnard Dunkelberg Company, 2008).

All Build Alternatives would convert the existing HOV lane on northbound I-680 to a managed lane at this location. Adherence to applicable federal, State, and local regulations during project construction and maintenance would reduce the risk of exposure to hazardous materials. In addition, Measure **HAZ-6**, requires the preparation of a Health and Safety Plan for construction workers. The Project, under all Build Alternatives, is not expected to result in a safety hazard for people residing or working in the Project area. The impact would be less than significant. Mitigation is not required.

f) Less Than Significant Impact

The Project is located within Contra Costa County and overlaps several cities and communities. The purpose of the Project includes reducing peak period congestion and delay on northbound I-680 and optimizing freeway systems management and traffic operations. The added infrastructure, such as traffic monitoring, could be leveraged by first responders in coordination with Caltrans during an evacuation to assist with the flow of emergency traffic and communications. The Project would require local road closures, ramp closures, and full or partial lane and shoulder closures along I-680 during Project construction. As described in Section 1.4.1.6, *Standardized Project Measures*, a TMP would be prepared during the design phase of the Project to address the potential for traffic disruptions, which could interfere with emergency response and evacuation. The TMP would include outreach to inform local jurisdictions, agencies, and the public of the times and locations of upcoming construction, construction signs in and approaching the project area, and incident management for traffic control in the vicinity of construction activities. Access would be maintained for emergency response vehicles. The Build Alternative would not impair implementation of an emergency

response or emergency evacuation plan. The impact would be less than significant. Mitigation is not required.

g) Less Than Significant Impact

The Build Alternatives would not change the I-680 alignment or any adjacent land uses. Section 3.2.20, *Wildfire*, and Section 3.3, *Wildfire*, describe fire hazard conditions in the Project area and the reasons why the Build Alternatives are not anticipated to exacerbate wildfire risks. Project construction and operation would not expose people or structures to significant risks involving wildland fires. The impact would be less than significant. Mitigation is not required.

3.2.10 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 or otherwise substantially degrade surface or ground water quality?	☐	☐	☒	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
i) result in substantial erosion or siltation on- or off-site;	☐	☐	☒	☐
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☐	☒	☐
iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☒	☐
iv) impede or redirect flood flows?	☐	☐	☒	☐

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☒	☐
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐

3.2.10.1 CEQA Significance Determinations for Hydrology and Water Quality

a) Less Than Significant Impact

As described in Section 2.2.2, *Water Quality and Stormwater Runoff*, Alternatives 1C, 2, 3, and 5 would result in an estimated disturbed surface area (DSA) of 30.83 acres, 24.41 acres, 37.24 acres, and 10.65 acres, respectively. Temporary impacts on water quality may result from disturbance related to construction activities. Although temporary impacts from soil disturbance and the operation of construction equipment have the potential to negatively impact water quality, construction site BMPs for erosion, sediment control, and material management would be implemented during construction, as specified in the required stormwater pollution prevention plan (SWPPP) and Measures **WQ-1** and **WQ-2**, which are described in Section 2.2.2, *Water Quality and Stormwater Runoff*. Measures **WQ-3** and **WQ-4** would be implemented, requiring that during final design, pollution prevention BMPs and treatment BMPs consistent with the NPDES Permit and Waste Discharge Requirements for the State of California, Department of Transportation, Order No. 2012-0011-DWQ, National Pollutant Discharge Elimination System (NPDES) No. CAS000003, be investigated. Impacts would be less than significant. Mitigation is not required.

b) Less Than Significant Impact

The Project Study Limits overlap the Ygnacio Valley and is near the San Ramon Valley groundwater basins (California Department of Water Resources 2022). The Ygnacio Valley and San Ramon groundwater basin encompass approximately 25 square miles and 11 square miles, respectively. The additional impervious area that would result from each Build Alternative is minimal in comparison with the total area of the local aquifers and groundwater basins. Groundwater depth is variable and has been encountered at 26 feet below the existing surface. Construction activities include excavation depths ranging from 1 foot for maintenance vehicle pullouts to up to 75 feet for abutment and bent piles for bridge widening. Therefore, the Project has the potential to encounter groundwater. However, pilings would be installed using the wet method, and dewatering would not be required. Impacts would be less than significant. Mitigation is not required.

c) Less Than Significant Impact

The Project, under all Build Alternatives, would not substantially alter the course of any stream or river. All Build Alternatives would increase the amount of impervious surface compared to existing conditions. Alternative 1C is estimated to result in approximately 20.28 acres of new impervious surface, which includes 9.46 acres of net new impervious surface and 10.82 acres of replaced impervious surface. Alternative 2 (preferred alternative) is estimated to result in approximately 15.70 acres of new impervious surface, which includes 7.69 acres of net new impervious and 8.01 acres of replaced impervious surface. Alternative 3 is estimated to result in approximately 24.73 acres of new impervious surface, which includes 11.69 acres of net new impervious surface and 13.04 acres of replaced impervious surface. Alternative 5 is estimated to result in approximately 5.83 acres of new impervious surface, which includes 2.93 acres of net new impervious surface and 2.90 acres of replaced impervious surface.

The post-construction treatment goal for the Project is to fully treat 24.73 acres of new impervious surface. Potential BMP areas are identified in Appendix I.1, *Project Feature Figures and Impact Maps*. Due to direction from Caltrans to avoid sensitive habitat in the northern portion of the Project Study Limits, the current design BMPs collectively have a total treatment area of 21.73 acres. Therefore, Alternatives 1C, 2, and 5 would include post-construction treatment areas that fully account for all new impervious surfaces. Meanwhile, Alternative 3 would result in a total stormwater treatment deficit of 3.71 acres. Should Alternative 3 have been selected as the preferred alternative, and the final design continue to show a post-construction treatment deficit, Caltrans or CCTA would have had to identify potential opportunities to partner with local communities within the watershed to achieve off-site alternative compliance stormwater treatment credit.

Implementation of standard Caltrans practices for erosion control and Measures **WQ-1** through **WQ-4**, which are described in Section 2.2.2, *Water Quality and Stormwater Runoff,* would avoid or minimize the Project's potential to result in substantial erosion or siltation, increase runoff volumes in a way that would result in flooding, exceed drainage system capacity or provide substantial polluted runoff, or impede or redirect flood flows. According to the Project's *Location Hydraulic Survey*, the amount of new impervious surface area being added is insignificant relative to the area of the watershed along San Ramon (WRECO, 2022). Construction activities and operation of the roadway improvements would be regulated under the applicable Caltrans' NPDES permits and Storm Water Management Plan, which regulate storm water discharge from activities on roadways. These are standard practices for Caltrans projects and not mitigation. The impact would be less than significant. Mitigation is not required.

d) Less Than Significant Impact

As described in Section 2.2.1, *Hydrology and Floodplain*, the Project Study Limits overlap or are immediately adjacent to Federal Emergency Management Agency-designated Special Flood Hazard Areas. According to the California

Department of Conservation, the Project Study Limits are outside a Tsunami Hazard Area (California Department of Conservation, 2021).

All Build Alternatives would result in no to negligible increases to the base flood plains. The performance standard for BMP treatments would be to reduce post-construction flows to pre-construction flow volumes and velocities to the maximum extent practicable. The treatment BMPs would be further developed in accordance with the requirements of Caltrans' MS4 permit during final design. BMP areas would be designed above the base flood elevation at San Ramon Creek near Livorna Road and would have a negligible impact on the Peyton Slough floodplain (less than 1 foot). The piers and abutment associated with the proposed widening of the Rudgear Road Undercrossing Bridge (Alternatives 1C, 2, and 3) would be located outside of the concrete-lined channel and floodplains. There are no designated Special Flood Hazard Areas in the vicinity of the Contra Costa Canal Undercrossing Bridge (Alternatives 2, 3, and 5). Therefore, the Project would not risk release of pollutants due to project inundation. The impact would be less than significant. Mitigation is not required.

e) Less Than Significant Impact

The project is required to adhere to the requirements of the Clean Water Act, the Porter-Cologne Water Quality Control Act, the Caltrans MS4 Permit, and the other laws and regulations described in Section 2.2.2, *Water Quality and Stormwater Runoff*. As a result, the project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

3.2.11 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?	☐	☐	☐	☒
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

3.2.11.1 CEQA Significance Determinations for Land Use and Planning

a) No Impact

The Project, under all Build Alternatives, would be constructed in or along Caltrans ROW. Implementation of the Build Alternatives would result in several new structures

associated with new bridge overcrossings, noise barriers, retaining walls, drainage systems, electronic toll collection equipment, and overhead sign structures, none of which would divide or introduce a new physical barrier to the communities and neighborhoods. Communities and neighborhoods in the Community Impact Study Area are already divided by a multi-lane highway. Therefore, the addition of structures described above would not further divide any communities or neighborhoods. Vehicular, pedestrian, and bicyclist circulation to/from local streets and private properties in the vicinity of the Project Study Limits would be maintained at all times during construction. As described in Section 1.4.1.6, *Standardized Project Measures*, a TMP would be prepared that would identify strategies to reduce impacts to transportation access during construction. Thus, substantial disruptions to local circulation on a temporary basis are not anticipated. The Project would not physically divide an established community. There would be no impact.

b) No Impact

As described in Section 2.1.2, *Consistency with State, Regional, and Local Plans and Programs*, the proposed Project under all Build Alternatives would be consistent with all applicable land use plan, policies, and regulations. The proposed Project would not cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted to avoid or mitigate an environmental effect. There would be no impact.

3.2.12 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?	☐	☐	☐	☒
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?	☐	☐	☐	☒

3.2.12.1 CEQA Significance Determinations for Mineral Resources

a, b) No Impact

The Project Study Limits do not overlap areas classified as mineral resource zones (Kohler-Antablin, 1996). The proposed Project would not require the acquisition of lands classified as mineral resource zones. Contra Costa County's *2045 General Plan* (Contra Costa County, 2024) identifies that there is a significant diabase deposit near Mt. Zion,

located approximately 5.3 miles east of the Project Study Limits, near the City of Concord. Diabase is an intrusive igneous rock that is used extensively for road base and as rip-rap to prevent streambank erosion. The types of materials used for proposed Project construction under all Build Alternatives would be determined during final design. The proposed Project would not result in the loss of availability of a known mineral resource or locally important mineral resource recovery site. There would be no impact.

3.2.13 Noise

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☒	☐

3.2.13.1 CEQA Significance Determinations for Noise

a, b) Less Than Significant Impact

A comparison to the baseline noise level and the build noise level is required to determine whether a noise impact is significant under CEQA. The CEQA noise analysis is completely independent of the NEPA/23 CFR 772 analysis discussed in Section 2.2.7, *Noise and Vibration*, which is centered on noise abatement criteria (NAC). Under CEQA, the assessment entails looking at the setting of the noise impact and then how large or perceptible any noise increase would be in the given area. Key considerations include the uniqueness of the setting, the sensitivity of the noise receptors, the magnitude of the noise increase, the number of residences affected, and the absolute noise level.

Construction Impacts

As described in Section 2.2.7, *Noise and Vibration*, noise levels during construction of the Build Alternatives may intermittently dominate the noise environment in the immediate area of construction. Although the overall construction schedule for the Project may extend over approximately 2 years, roadway construction activities typically occur for relatively short periods of time in any specific location as construction proceeds along the Project's alignment. Most construction phases would generate average noise levels ranging from 83 to 91 A-weighted decibels (dBA) at 50 feet. Average noise levels with impact pile driving would be up to 101 dBA at 50 feet. Maximum instantaneous noise levels would range from 84 to 85 dBA at 50 feet without impact driving and up to 96 dBA at 50 feet with impact pile driving. As specified in Measure **NOI-1**, project construction would require compliance with the Caltrans Standard Special Provision (SSP) 14-8.02 and would limit pile driving to daytime hours, where feasible.

It is possible that certain construction activities could cause intermittent localized concern from vibration in the resource study area. Processes such as pile driving, demolition, pavement breaking, earth moving with bulldozers, and the use of vibratory compaction rollers may cause construction-related vibration impacts, including human annoyance or, in some cases, building damage. It may be necessary to use this type of equipment in close proximity to existing structures and buildings. Vibration levels could potentially exceed 0.5 inch per second PPV within 55 feet of industrial buildings at 511 Lawrence Way, as well as residential apartment buildings at 125 Near Court, 1309 Creekside Drive, 1335 Creekside Drive, and 1355 Creekside Drive. Measure **VIB-1** would be implemented, which includes procedures to be followed that would minimize potential impacts from construction vibration. A combination of techniques for equipment vibration control, as well as administrative measures, when properly implemented, can be selected to provide the most effective means to minimize the effects of construction activity. The construction impact would be less than significant. Mitigation is not required.

Operational Impacts

Caltrans typically uses a 12 dB threshold to identify areas where there would be a substantial increase in noise. There could be settings where an increase less than 12 dB would approach significance (such as a quiet rural environment) or where a 12 dB increase would not necessarily be deemed significant (noisy urban environment). In addition, if the absolute future noise level is less than 67 dBA, that may be a factor in determining whether a noise impact is less than significant.

Appendix J.3, *Existing and Predicted Future Noise Levels*, provides the existing and predicted future noise levels for each Build Alternative. All Build Alternatives are anticipated to increase Design Year (2047) noise levels by 0 to 2 dBA over the No-Build Alternative. Noise level increases of 1 to 2 dB are generally not perceptible and increases of 3 dB are barely detectable. Of the 373 receiver locations modeled along the corridor, Alternative 1C is projected to result in perceptible noise increases (i.e.,

greater than or equal to 3 dBA) at 23 receivers, Alternative 2 (preferred alternative) is projected to result in perceptible noise increases at 12 receivers, Alternative 3 is projected to result in perceptible noise increases at 20 receivers, and Alternative 5 is projected to result in perceptible noise increases at 3 receivers compared to existing (2020) conditions. The increase in noise is primarily due to the projected increase in VMT overtime. The difference between the Build Alternatives (2047) and existing conditions would be similar to that of the No-Build Alternative. Alternative 1C would increase noise levels by -2 to 10 dBA, Alternatives 2 and 3 would increase noise levels by -2 to 9 dBA, and Alternative 5 would increase noise levels by -2 to 3 dBA, compared to existing conditions. As such, none of the Build Alternatives would result in a substantial increase in noise compared to existing conditions. Alternative 1C would result in an increase in noise that would approach substantial at one residential receiver (1376 Creekside Drive-Pool Area [R226]). No lands on which serenity and quiet are of extraordinary significance were identified. Therefore, the operational noise impact would be less than significant. Mitigation is not required. However, under NEPA/23 CFR 772, noise abatement would still be considered at locations where operational noise is projected to approach or exceed the noise abatement criteria (NAC) described in Section 2.2.7, *Noise and Vibration*. The operational impact would be less than significant. No mitigation is proposed.

c) Less Than Significant Impact

The Project Study Limits are not in the vicinity of any private airstrip. Buchanan Field Airport is a public airport that is located adjacent to northbound I-680, northeast of the Concord Avenue Intersection. The airport influence area extends 14,000 feet from runway 1L, which overlaps the Project Study Limits (Contra Costa County Airport Land Use Commission, 2000). The composite noise contours for the airfield range from 55 community noise equivalent level decibels (dB CNEL) north and south of Concord Avenue (Safety Zone 4) to greater than 65 dB CNEL at the Concord Avenue Intersection (Safety Zones 2 and 3). These safety zones limit land use development within the airport influence area. Construction workers could temporarily be exposed to aircraft noise while performing construction activities in the vicinity of Concord Avenue. Construction contractors would be required to comply with all existing Occupational Safety and Health Administration (OSHA) and California Division of Occupational Safety and Health (Cal-OSHA) requirements regarding occupational noise exposure. The Project would not expose people using the freeway or residing or working in the Project area to excessive airport-related noise levels. The impact would be less than significant. Mitigation is not required.

3.2.14 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 unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☒	☐
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

3.2.14.1 CEQA Significance Determinations for Population and Housing

a) Less Than Significant Impact

None of the Build Alternatives propose to build new homes or businesses. Although small strips of ROW would be required, none of the Build Alternatives would change the zoning or land use designation of any parcel. The primary purpose of the Project is to reduce travel time and delay, encourage use of HOV and transit services, and offer non-carpool drivers a reliable travel time option. Alternatives 1C, 2, and 3 would increase highway capacity. Although Alternatives 2, 3, and 5 propose constructing braided ramps at Treat Boulevard, these braided ramps would replace an existing auxiliary lane and would not increase the number of ramps along the freeway. By improving access and highway capacity, the Build Alternatives could indirectly result in the development and intensification of land uses in cities surrounding the project limits. However, the surrounding areas are largely built out, and the majority of future development would generally involve redevelopment of existing areas or infill development of vacant lots within urbanized areas. As described further in Section 2.1.4, *Growth*, none of the Build Alternatives would induce growth. The impact would be less than significant. Mitigation is not required.

b) No Impact

Based on preliminary design, implementation of the Build Alternative would require acquisition of portions (or slivers) of 10 parcels within the Project Study Limits (see Section 2.1.5, *Community Character and Cohesion*). The land required for the Build Alternative consists primarily of slivers of property frontage and landscaped areas around on-ramps and off-ramps near the SR-24 interchange. None of the Build Alternatives are anticipated to result in the permanent or temporary relocation or

displacement of any person or housing requiring the construction of replacement housing elsewhere. There would be no impact.

3.2.15 Public Services

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) 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:				
i) Fire protection?	☐	☐	☒	☐
ii) Police protection?	☐	☐	☒	☐
iii) Schools?	☐	☐	☒	☐
iv) Parks?	☐	☐	☒	☐
v) Other public facilities?	☐	☐	☒	☐

3.2.15.1 CEQA Significance Determinations for Public Services

a) Less Than Significant Impact

The Project would not involve construction of new housing or other land uses that could increase the local population and demand for governmental facilities and services, such as fire protection, police protection, schools, or parks. Project construction has the potential to increase traffic delays on I-680 that could affect response times of emergency response vehicles. However, a TMP would be implemented to minimize construction-related delays and ensure accessibility throughout the corridor for emergency service providers. These emergency service routes would be maintained during construction or alternate routes provided. Once construction is complete, traffic circulation would soon return to normal. The Project's intent is to reduce travel time and improve travel time reliability for travelers in the I-680 corridor, encourage the use of HOV and transit service, optimize the use of the existing HOV lane capacity in the I-680 corridor to better meet current and future traffic demands, and offer non-carpool eligible drivers a reliable travel time option. Overall, the improvement to traffic operations and congestion could decrease fire and police protection response times. As described in Section 2.1.4, *Growth*, the Project is not growth inducing. The Project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or the need for new or physically altered governmental facilities. Impacts would be less than significant. Mitigation is not required.

3.2.16 Recreation

Would the project:	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?	☐	☐	☐	☒
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?	☐	☐	☒	☐

3.2.16.1 CEQA Significance Determinations for Recreation

a) No Impact

The project would accommodate planned growth but would not increase the use of existing parks or other recreational facilities such that physical deterioration of the facility would occur or be accelerated. Access to recreational facilities would be maintained. There would be no impact.

b) Less Than Significant Impact

The Project would not include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment. Alternatives 1C, 2, and 3 include temporarily closing a segment of the Iron Horse Regional Trail to widen the Rudgear Road Undercrossing Bridge during construction. In addition, Alternatives 2, 3, and 5 include temporarily closing a segment of the Contra Costa Canal Trail/Briones to Mount Diablo Regional Trail to widen the Contra Costa Canal Undercrossing Bridge. As described in Section 2.1.3, *Parks and Recreational Facilities*, CCTA and Caltrans would work with the East Bay Regional Park District to identify temporary detours for these recreation trails prior to construction in accordance with **PR-1**. It is anticipated that detours would be located on existing paths and/or roadways and would not result in adverse physical effects on the environment. Access to recreational facilities would be maintained.

Alternatives 1C, 2, and 3 would require shifting a segment of the Iron Horse Regional Trail beneath the Rudgear Road Undercrossing Bridge to avoid a proposed bridge column. The relocation of this segment of the trail would be developed during final design in coordination with the East Bay Regional Park District in accordance with Measure **PR-3**. The new alignment is not anticipated to result in an adverse physical

effect on the environment. The impact would be less than significant. Mitigation is not required.

3.2.17 Transportation

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☒	☐
b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☒	☐	☐	☐
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
d) Result in inadequate emergency access?	☐	☐	☒	☐

3.2.17.1 CEQA Significance Determinations for Transportation

a) Less Than Significant Impact

The Build Alternatives would be generally consistent with applicable programs, plans, ordinances, and policies regarding the circulation system, which are described in Sections 2.1.2, *Consistency with State, Regional, and Local Plans and Programs*. In addition, CCTA is the congestion management agency for Contra Costa County and is responsible for preparing a Congestion Management Program (CMP) for the County. The latest Congestion Management Program is focused primarily on updating the Capital Improvement Program, monitoring the performance of the CMP network, and addressing the implementation of SB 743 in Contra Costa. The plan proposes to close gaps in the HOV lane system on I-680 through the SR-24 Interchange (northbound and southbound) and includes conversions of HOV lanes to tolled express lanes on I-680. In addition, CCTA's *Measure J Transportation Sales Tax Expenditure Plan* includes extending existing bus/carpool lanes on northbound I-680 from North Main Street to north of SR-242 (Contra Costa Transportation Authority, 2011). The impact would be less than significant. Mitigation is not required.

b) Significant and Unavoidable

For CEQA compliance, daily VMT are reported for the five-county Metropolitan Statistical Area, which includes Alameda, Contra Costa, Marin, San Francisco, and San Mateo counties. The estimated daily VMT under the Existing Conditions (2020 base year) is approximately 96,695,358 (Kittelson & Associates and DKS Associates, 2022). Daily VMT would increase to 115,101,953 by the Design Year (2047) for the No-Build Alternative (Kittelson & Associates, 2023).

The Contra Costa Countywide travel model (Countywide Model), which is maintained by CCTA, was selected as the tool for the Project travel forecasts (Kittelson & Associates and DKS Associates, 2022). As discussed in Section 2.1.8, *Traffic and Transportation/ Pedestrian and Bicycle Facilities*, a model benchmarking approach was applied to provide VMT analysis for the Project. Revisions were made to the Countywide Model to ensure that the most important travel behavior changes would be represented, which included express lane modeling, HOV modeling, and induced demand adjustments. The Countywide Model was validated for use in this study by comparing model output to traffic counts collected primarily in November 2019. These counts represent more typical traffic conditions prior to the reduced travel associated with COVID-19. The Project's *Travel Forecast Report* (Kittelson & Associates and DKS Associates, 2022), completed in February 2022, includes additional detailed information regarding the method and modeling that was used to forecast VMT. Updated forecasted VMT for the No-Build Alternative and each Build Alternative were provided in September 2023 (Kittelson & Associates, 2023).

Normally, future conditions with a project are compared to a baseline of existing conditions for CEQA. However, alternatives to an existing conditions baseline may be appropriate in certain circumstances. Comparing a project's VMT to existing conditions would combine the project's VMT effects with other effects on VMT that occur over time, such as increases in population or economic activity, in effect misleading the public and decision-makers by obscuring the impacts of the project itself. In accordance with Caltrans' *Transportation Analysis under CEQA* (TAC), future build alternatives were compared to the future No-Build Alternative (i.e., the conditions expected to exist in the future absent the project) to determine the amount of VMT attributable to the Project. (California Department of Transportation, 2020; 2025)

Raw VMT Impacts

Alternatives 1C, 2, and 3 would add capacity to northbound I-680 and induce VMT compared to existing conditions and the No-Build Alternative. Table 3.2.17-1 compares the forecasted change in VMT for each Build Alternative to the No-Build for the Opening Year (2027) and Design Year (2047). Compared to the No-Build, Alternatives 1C, 2, and 3 would result in an increase of 102,122 daily VMT; 84,398 daily VMT; and 102,985 daily VMT, respectively, for the Design Year. The Governor's Office of Planning and Research guidelines excludes trucks from VMT calculations for CEQA impacts. Removing trucks, Alternatives 1C, 2, and 3 would result in an increase of 99,389 daily VMT; 82,353 daily VMT; and 99,986 daily VMT, respectively, for the Design Year

compared to the No-Build Alternative. Therefore, Alternatives 1C, 2, and 3 would all result in a potentially significant impact on transportation under CEQA.

Table 3.2.17-1. VMT Estimates for Build Alternatives Evaluated

Alt.	Opening Year (2027)		Design Year (2047) With Trucks			Design Year (2047) Without Trucks	
	Daily VMT	Difference from No-Build	Daily VMT	Difference from No-Build	Daily Truck VMT	Daily VMT	Difference from No-Build
No-Build	102,853,478	-	115,101,953	-	3,697,410	111,404,543	-
Alt 1C	102,922,450	+68,973	115,204,075	+102,122	3,700,143	111,503,933	+99,389
Alt 2*	102,916,580	+63,102	115,186,351	+84,398	3,699,455	111,486,896	+82,353
Alt 3	102,925,286	+71,808	115,204,937	+102,985	3,700,408	111,504,529	+99,986

Source: (Kittelson & Associates, 2023)
Notes: Vehicle miles traveled (VMT) for five county Metropolitan Statistical Area – Alameda, Contra Costa, Marin, San Francisco, San Mateo counties. Alternative 5 is not included because it was screened from VMT analysis and mitigation in accordance with Caltrans, *Transportation Analysis under CEQA*, First Edition (California Department of Transportation, 2020; 2025)
* Alternative 2 is the preferred alternative.

As described in more detail below, Alternative 5 is not shown in Table 3.2.17-1 because it was screened from VMT analysis and mitigation in accordance with the TAC (California Department of Transportation, 2020; 2025).

VMT Mitigation Measures Reviewed

CEQA mitigation is required when changes to a project or project alternative cannot avoid or substantially lessen a significant impact under CEQA. According to the TAC (California Department of Transportation, 2025), there must be a rational relationship between the impact and the mitigation for that impact (i.e., “nexus”), and the mitigation must be roughly proportional to the impact (i.e., “proportionality”) (see CEQA Guidelines Section 15041[a]). Mitigation must also be feasible and enforceable.

Caltrans and many stakeholders are interested in organizing mitigation efforts through VMT impact fee programs, mitigation banks, or mitigation exchanges (Center for Law, Energy, and the Environment, 2022; Fehr and Peers, 2020). A transportation impact fee program is a traditional impact fee program in compliance with the Mitigation Fee Act. Mitigation banks allow project sponsors to mitigate VMT by committing funds to buy credits for mitigation projects. Mitigation exchanges would require the selection of a mitigation project from a list of pre-approved mitigation projects. Contra Costa County does not currently have a working VMT impact fee program, bank, or exchange in place that could be used for the current Project.

Therefore, the Project Development Team (PDT) focused primarily on identifying direct mitigation for the Project (i.e., mitigation when a lead agency commits to developing or funding specific VMT-reducing projects or initiatives). Through researching the TAC, projects in the RTP (*Plan Bay Area 2050*), projects that were not included in the RTP, and recent planning studies, the PDT considered over 120 projects and initiatives as mitigation for the proposed Project. This list was screened down and evaluated based on several factors, such as feasibility, cost effectiveness, efficacy in VMT reduction, additionality, sponsor willingness, and schedule (i.e., can the mitigation be implemented in a reasonable time frame). "Additionality" refers to the assurance that a mitigation investment provides additional resources that otherwise would not have been provided or provides additional resources substantially earlier than otherwise would have been available but for the project.

The PDT also considered two mitigation alternatives for the Project—Build Alternative 4 (Reduce the Gap with HOV Conversion) and Build Alternative 5 (Reduce the Gap with Express Lane Conversion and Braided Ramps). As discussed in Section 1.4.6, *Alternatives Considered but Eliminated from Further Discussion Prior to Draft Environmental Impact Report/Environmental Assessment*, Alternative 4 was considered but eliminated from further discussion prior to the Draft EIR/EA. Alternative 5 was carried forward for evaluation in the Draft EIR/EA and is discussed further below.

VMT Mitigation Measures Incorporated

Alternatives 1C, 2, and 3 include the following VMT mitigation measures:

TRAN-MM-1 ***I-680 Express Bus Service.*** CCTA will work with County Connection and Livermore Amador Valley Transit Authority (LAVTA) to implement a new I-680 express bus service and provide funding to rebrand, refurbish, and upgrade six existing buses for interim service (before hydrogen fuel-cell buses are available) and acquire six hydrogen fuel-cell buses (and one spare) when they are available for purchase.

TRAN-MM-2 ***Shared Mobility Hubs.*** CCTA will pursue funds and ensure the implementation of the following mobility hubs: Bollinger Canyon Road, Walnut Creek BART Station, and Martinez Amtrak Station. These hubs will be designed to support I-680 Express Bus Service as well as other fixed-route transit services. The hubs may include mobility hub improvements and Mobility-on-Demand (MoD)/Mobility-as-a-Service (MaaS) application and could potentially include additional mobility services, such as microtransit and/or increased eBike/eScooter operations.

TRAN-MM-3 ***Transportation Demand Management (TDM) Program Augmentation.*** CCTA will pursue funds and ensure the implementation of a countywide TDM Program for the Project. This program will consist of enhancing existing and creating new

TDM incentives within Contra Costa County. The program will not supplant, supersede, or replace current CCTA TDM initiatives funded by the Transportation Fund for Clean Air (TFCA) or Measure J. CCTA will operate the program through the County's existing TDM program (511 Contra Costa [511CC]).

As described further in Chapter 6, *Comments and Coordination*, the proposed Project is part of a suite of six separate projects known as the INNOVATE 680 Program. As described in CCTA's Congestion Management Program, INNOVATE 680 includes the following transit improvements: "Project components include Express Bus Service, ITS, Bus on Shoulder, and Park & Ride Lots" (Contra Costa Transportation Authority, 2019).

Transit Projects

The I-680 express bus service (**TRAN-MM-1**) would operate along I-680 between the Martinez Amtrak Station and Dublin/Pleasanton BART Station and include intermediate stops at the Walnut Creek BART Station and Bollinger Canyon Road, with service to the ACE Pleasanton Station during peak periods. The express bus, operated with zero-emission hydrogen fleet when available, would fill an existing service gap identified in the 2018 California State Rail Plan (California Department of Transportation, 2018). The Project Sponsor, CCTA, is currently developing the I-680 express bus program in partnership with Central Contra Costa Transit Authority (dba County Connection) and LAVTA (Contra Costa Transportation Authority, Livermore Amador Valley Transit Authority, and Central Contra Costa Transit Authority, 2022). The I-680 express bus is still in the conceptual design phase and would be seeking separate environmental approval(s), if necessary. The I-680 express bus is estimated to result in a daily VMT reduction of approximately 36,800 VMT.

Shared mobility hubs (**TRAN-MM-2**) would be implemented at the following locations: Bollinger Canyon Road, Walnut Creek BART Station, and Martinez Amtrak Station. Shared mobility hubs are places of connectivity where different travel options—biking, transit, carpooling, van pooling, ride-sourcing, and micro transit—come together. These hubs would complement the express bus, transit bus on shoulder, and connections to other modes, such as microtransit, carpooling, vanpooling, ride-sharing (i.e., Uber, Lyft), bicycle and scooter-share, and pedestrian facilities. The shared mobility hubs are also still in the conceptual design phase and would be seeking separate environmental approval(s), if necessary. As described further below, these hubs would include either a 1- or 2-mile radius of non-automobile access connection improvements.

In order to calculate the potential VMT reduction, the I-680 express bus was modelled alone and with the three shared mobility hubs (Kittelson & Associates, 2022). VMT forecasting for the shared mobility hubs also assumes that the hubs would include either a 1- or 2-mile-radius of non-automobile access connection improvements. As shown in Table 3.2.17-2, shared mobility hubs are estimated to result in a daily VMT reduction of between approximately 6,600 and 15,400 VMT (Kittelson & Associates, 2022). Combining **TRAN-MM-1** and **TRAN-MM-2** would result in a daily VMT reduction of approximately 43,400 (1 mile) and 52,500 VMT (2 miles).

Table 3.2.17-2. Potential Vehicle Miles Traveled Reduction for Shared Mobility Hubs

Radius	Assumptions	Daily VMT Reduction
1 mile	Primarily walk or non-motorized access; represents safety and access improvements at a mobility hub and Mobility on Demand and Mobility as a Service (MoD/MaaS) applications, without the provision of additional services such as microtransit.	6,600
2 miles	Improvements at the mobility hub and improved local mobility access by modes such as expanded electric bikes or scooters and/or microtransit connected to MoD/MaaS applications.	15,400

Source: (Kittelson & Associates and DKS Associates, 2022)
Notes: Vehicle miles traveled (VMT) for five county Metropolitan Statistical Area – Alameda, Contra Costa, Marin, San Francisco, San Mateo counties.

Both transit improvement projects would enhance mobility along the I-680 corridor. As such, there is a strong nexus between these projects and the Project. The express bus service would benefit from the improved travel time and travel time reliability that the I-680 northbound express lane is estimated to provide.

TDM Program

Mitigation Measure **TRAN-MM-3** would consist of augmenting existing incentives and creating new trip reduction and transit incentives within Contra Costa County. Contra Costa County's existing TDM program is 511CC. Sponsorship and administration of 511CC is currently provided by CCTA and its subregional transportation planning committees (SWAT, TRANSPAC, TRANSPLAN, and WCCTAC). Existing trip reduction programs within 511CC include the following:

- Ride 4 Free Transit – Free transit passes
- Drive Less / Leave Car at Home – Monetary incentive to replace drive alone commute trips with alternate modes
- BOGO – Discounted transit passes
- School Pool/Pass2Class – Free bus passes to school
- E-bike Rebate – Rebates for e-bike purchases

Mitigation Measure **TRAN-MM-3** would fund and deliver new trip reduction incentives and/or augment existing incentive programs through 511CC. Existing 511CC programs that could potentially be augmented or enhanced by project mitigation funding include School Pass/Pass2Class, Ride 4 Free Transit, BOGO, and Drive Less. The following types of trip reduction programs would also be routinely considered:

- Free or Discounted Transit Passes
- Monetary Incentives to Drive Less
- School Transit Passes
- Micromobility Incentive

Funding for 511CC is currently provided by the Bay Area Air Quality Management District's (BAAQMD) Transportation Fund for Clean Air (TFCA) and by Measure J, which is the County's local half-cent sales tax. When the analysis for VMT mitigation strategies was conducted in 2022, participant surveys were used to document the effectiveness of existing TFCA-funded programs within 511CC, including the share of non-auto trips replacing auto trips, frequency of use, and distances traveled (Kittelson & Associates, 2022a). The benefits of these programs in terms of VMT are calculated by multiplying the number of participants by the number of trips per participant and the average trip distance reported by survey respondents. The reporting from 2022 indicates that previously implemented TDM programs across all county subregions resulted in an average reduction of 313,956 VMT per weekday.

VMT reductions related to the augmentation or expansion of 511CC for the Project under Mitigation Measure **TRAN-MM-3** is assumed to be proportional to increases in the number of persons participating in the incentive programs. For example, a 15 percent increase in program funding and participation would be expected to decrease daily VMT by 47,093 (that is, 313,956 * 15 percent) (Kittelson & Associates, 2022a).

CCTA would prepare an implementation plan for the TDM Program Augmentation during final design. A version of the implementation plan would be made available upon request when finalized and may be posted on the INNOVATE 680 website (https://ccta.net/projects/innovate-680/). The implementation plan for the TDM Program Augmentation would include details on specific trip reduction incentives and programs to offset the Project's induced VMT when combined with the other proposed mitigation measures as currently forecasted. That is, if the necessary funding sources are secured, the TDM program would aim to result in an average VMT reduction of 47,189 daily VMT for Alternative 1C, 30,153 daily VMT for Alternative 2, or 47,786 daily VMT for Alternative 3.[2]

VMT Mitigation Alternative Considered and Evaluated (Build Alternative 5)

Alternative 5 was considered and carried forward for evaluation in the Draft EIR/EA. Alternative 5 would convert existing general-purpose lanes and an HOV lane on

[2] This estimate assumes access improvements of 2 miles would be implemented for the shared mobility hubs. Should only 1-mile radius access improvements be implemented, the TDM program would be required to achieve the following: 55,989 daily VMT reduction for Alternative 1C, 38,953 daily VMT reduction for Alternative 2, and 56,586 daily VMT reduction for Alternative 3 by the Design Year.

northbound I-680 to an express lane. Alternative 5 would not add any through lanes. The proposed braided ramps would improve mobility and safety and would not increase through capacity of I-680 or any local road. According to the TAC (California Department of Transportation, 2020; 2025), projects that do not increase capacity are not likely to lead to a measurable and substantial increase in VMT and can be screened from having to prepare VMT analysis and mitigation. This includes the following project type: "Conversion of existing general-purpose lanes (including ramps) to managed lanes or transit lanes, or changing lane management in a manner that would not substantially increase vehicle travel." Therefore, in the Draft EIR/EA, Caltrans determined that the impact of Alternative 5 would be less than significant and mitigation was not required.

Alternative 5 was not selected as the preferred alternative for the Project for the reasons described in Section 1.4.5.1, *Identification of a Preferred Alternative*.

Net VMT Impacts

Alternative 2 has been selected as the preferred alternative for the Project. Table 3.2.17-3 presents the net VMT impacts of Alternative 2 with mitigation incorporated. Combining Mitigation Measures **TRAN-MM-1** and **TRAN-MM-2** in the model resulted in a daily VMT reduction of approximately 43,400 or 52,500 VMT, depending on the extent of non-automobile access connection improvements for the shared mobility hubs. Under Mitigation Measure **TRAN-MM-3**, CCTA and BAIFA would seek TDM funding to augment the existing 511CC program proportionate to any remaining Project-induced VMT. That is, pending available funding, the TDM program would aim to result in a daily VMT reduction of either 30,153 or 38,953 daily VMT for Alternative 2. Table 3.2.17-3 assumes 2 miles of access improvements around smart mobility hubs. When combined, these mitigation measures would seek to offset the Project's daily VMT over a period of 20 years, and could, individually or collectively, result in a mode shift that would go beyond the 20-year period.

Table 3.2.17-3. Net Daily VMT Impacts for Alternative 2 (Preferred Alternative)

Project Induced VMT	**+82,353**
TRAN-MM-1: I-680 Express Bus	-36,800
TRAN-MM-2: Shared Mobility Hubs	-15,400
TRAN-MM-3: TDM Program Augmentation	-30,153
TOTAL NET VMT IMPACTS	**0**

Sources: (Kittelson & Associates, 2023; 2022a; 2022b)
Notes: TDM = transportation demand management; VMT = vehicles miles traveled
* For TRAN-MM-2, 1 mile of improvements around mobility hubs would lead to a reduction of 6,600 VMT; 2 miles of improvements would lead to a reduction of 15,400 VMT. TRAN-MM-3 would then be used to offset any remaining VMT. This table assumes 2 miles of non-automobile access improvements would be implemented.

VMT Mitigation Estimated Cost

Alternative 2 has been selected as the preferred alternative for the Project. The total cost for VMT mitigation is estimated to be approximately $200 million.

VMT Mitigation Funding

VMT mitigation funding has yet to be fully secured. The Project Sponsor (CCTA) is committed to continuing to work with the express lane operator (Bay Area Infrastructure Financing Authority [BAIFA]) to seek the necessary funding to implement the proposed VMT mitigation measures for a 20-year period.

Indefinite mitigation funding is not currently available. It is currently infeasible for the Project to use toll revenue to fund VMT mitigation. In 2013, the MTC assigned the responsibilities for the express lanes to BAIFA under MTC Resolution 4087 Streets and Highways Code Section 149.7, under which the MTC express lanes network is authorized. This established the MTC network, also called the "BAIFA Express Lanes Facility," as a single financial enterprise, much in the same way the Bay Area Toll Authority toll bridges are a single enterprise. Revenue from any corridor in the facility can be used for eligible expenses on any other corridor.

In March 2024, BAIFA adopted an Express Lanes 10-Year Financial Plan (Financial Plan) and Reserves Policy (Bay Area Infrastructure Financing Authority, 2024). The Financial Plan includes actual revenue and expenses up to June 30, 2023, the budgeted revenue and expenses for fiscal year (FY) 2023–24, and projected revenues and expenses through FY 2032–33, offering a network-level financial perspective for BAIFA's express lanes and tolling infrastructure. The Financial Plan predicts sufficient revenue to cover operating and maintenance and repair and replacement costs, as well as to establish reserves. The Financial Plan does not predict any available toll revenues beyond reserves.

BAIFA's Reserves Policy sets forth appropriate levels of financial reserves for the BAIFA Express Lanes Facility to ensure financial stability; mitigate financial risks, such as revenue shortfalls or unanticipated costs; and maintain the long-term sustainability of the program, ensuring that the program can adapt to changing circumstances and maintain its operations over time. The Reserves Policy was developed based on BAIFA's annual Operating and Capital Budget adoption and the Financial Plan. The Financial Plan will be updated every 2 years and projections for available revenues could change in either direction. At this time, toll revenue is not available for VMT mitigation for the Project.

CCTA continues to actively pursue VMT mitigation funding. CCTA was awarded partial Transit and Intercity Rail Capital Program (TIRCP) grant funding for the I-680 Express Bus Program in July 2022, which includes partial funding for the I-680 express bus and the shared mobility hubs (Contra Costa Transportation Authority, Livermore Amador Valley Transit Authority, and Central Contra Costa Transit Authority, 2022). The TIRCP application specifically stated that the shared mobility hubs and the I-680 express bus

would be used to help mitigate the proposed Project.[5] CCTA was also awarded federal funding from the Carbon Reduction Program for an initial phase of both Martinez Amtrak Shared Mobility Hub and Walnut Creek BART Station Shared Mobility Hub.

Current grant programs that have the potential to fund future VMT mitigation include the following:

- Regional One Bay Area Grant Program
- Regional Transit-Oriented Communities & Climate Program Implementation Grants
- Transit and Intercity Rail Capital Program
- State Transportation Improvements Program
- Senate Bill 1 Local Partnership Program
- Senate Bill 1 Solutions for Congested Corridor Program
- Senate Bill 1 Active Transportation Program
- California Energy Commission Fuel and Transportation Funding Programs
- United States Department of Transportation Federal Funding Programs
- Bay Area Air Quality Management District's funding programs for public agencies

CCTA anticipates that it could receive additional funds from many of these sources to fund VMT mitigation but cannot feasibly estimate the total funds it would receive from these or other sources that may arise in the future. As such, total funding levels are uncertain for VMT mitigation.

Conclusion

The Project would result in a significant and unavoidable impact on transportation. CCTA is committed to working with BAIFA to seek mitigation funding for a period of 20 years. When combined, the proposed mitigation measures would seek to offset the Project's daily VMT for this 20-year period. These measures, individually or collectively, could potentially result in a mode shift that could go beyond this 20-year period. However, mitigation funding has not been fully secured, and indefinite ongoing

[5] The TIRCP application also says that the INNOVATE 680 Part-Time Transit Lane/Transit Bus on Shoulder Project will help mitigate VMT increases from the express lane component of INNOVATE 680 (Contra Costa Transportation Authority, Livermore Amador Valley Transit Authority, and Central Contra Costa Transit Authority, 2022). INNOVATE 680 Part-Time Transit Lane/Transit Bus on Shoulder was not proposed as mitigation because it is currently designated as a pilot project.

mitigation funding is not assured. Therefore, Caltrans has determined that the impact would be significant and unavoidable with mitigation and a Statement of Overriding Consideration is required in accordance with the TAC (California Department of Transportation, 2025).

c) No Impact

None of the Build Alternatives would increase hazards due to a geometric design feature or result in incompatible uses. There would be no impact.

d) Less Than Significant Impact

All Build Alternatives would retain and/or add CHP pullout areas along northbound I-680. The final locations of pullout areas would be confirmed during final design in coordination with CHP.

Temporary freeway, lane, and ramp closures on I-680 and temporary closures of local streets could be required during construction, which could temporarily affect emergency access. Anticipated closures are summarized for each Build Alternative in Section 1.4.2, *Unique Features of the Build Alternatives* under *Project Construction*.

The following two long-term ramp closures would be required:

- Alternatives 1C and 3: The southbound Olympic Boulevard off-ramp is anticipated to be closed for up to 11 months.
- Alternatives 2, 3, and 5: The northbound North Main Street off-ramp is anticipated to be closed for up to 1 month.

A Ramp Closure Study was prepared for these long-term ramp closures as part of the Community Impact Assessment (HDR Engineering, Inc., 2023). Travel time estimates were calculated, and potential detours were identified. Emergency response travel time was considered, particularly for emergency access to the Kaiser Permanent Walnut Creek Medical Center by Newell Avenue and South Main Street in Walnut Creek.

Caltrans Deputy Directive (DD) 60-R2, defines a Significant Traffic Impact as a delay of 30 minutes or more. The proposed project would result in a maximum detour delay of 7.6 minutes due to the temporary closure of the southbound Olympic Boulevard off-ramp and 5.8 minutes due to the temporary closure of the North Main Street off-ramp. In addition, the analysis showed that it was slightly faster (0.7 minutes) for vehicles to take the proposed detour to access the Kaiser Permanent Walnut Creek Medical Center rather than the southbound Olympic Boulevard off-ramp.

During final design, a more rigorous analysis will be conducted of long-term ramp closures and a TMP would be developed for the project to minimize construction-related delays. The TMP would include notification to emergency service providers and the public of lane and ramp closures and detours; coordination with CHP and local law

enforcement on contingency plans; and use of portable Changeable Message Signs, CHP's Construction Zone Enhanced Enforcement Program, and Freeway Service Patrol where possible to minimize delays. Law enforcement, fire, and/or emergency service access would be maintained during Project construction and operation. The Project is not expected to result in inadequate emergency access. The impact would be less than significant. Mitigation is not required.

3.2.18 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:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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	☐	☐	☐	☒
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.	☐	☐	☐	☒

3.2.18.1 CEQA Significance Determinations for Tribal Cultural Resources

a, b) <u>No Impact</u>

A request for a search of the sacred lands file and a list of interested individuals was sent to the California NAHC on August 3, 2020. The NAHC responded on August 18, 2020, with negative results for sacred lands in the vicinity of the APE and provided a list of 12 interested individuals. The Project Sponsor (CCTA) conducted consultation with each of the representatives on the NAHC list. Letters were sent to individuals on August 31, 2020, with a second letter following on August 17, 2021. The latter detailed changes to the proposed Project and provided a new map set. A final email was sent to all interested party contacts on September 10, 2021, soliciting final comments on the

proposed Project prior to the completion of cultural studies. No responses were received at that time.

In support of the Extended Phase I Report for the proposed Project, emails (with attached letters and maps) were issued by Far Western to all parties on April 12, 2023. Follow-up phone calls were conducted by Far Western on May 12, 2023, and additional phone-calls and email correspondence were initiated by CCTA (in coordination with Caltrans) later the same month. Representatives from the Amah Matsun Tribal Band of Mission San Juan Bautista, The Confederated Villages of Lisjan, Indian Canyon Mutsun Band of Costanoan, and The Ohlone Indian Tribe requested a follow-up or further consultation. All further correspondence was conducted by either CCTA or Caltrans, and documentation is on file with the agencies. Coordination with the Native American tribes would continue throughout the duration of the proposed Project.

No tribal cultural resources have been identified within the APE. In addition, no comments were received from tribal governments during the public comment period of the Draft EIR/EA. As discussed in Section 1.4.1.6, *Standardized Project Measures*, Caltrans' Standard Specifications require construction contractors to stop all work within 60 feet of an unanticipated discovery of a cultural resource or human remains and not resume work until authorized. Measure **CUL-1**, in Section 2.1.10, *Cultural Resources*, would be implemented to ensure that all earth-moving activity within and around an immediate cultural materials discovery area would be diverted until a qualified archaeologist can assess the nature and significance of the find. In addition, Measure **CUL-2**, in Section 2.1.10, *Cultural Resources*, would be implemented if suspected Native American human remains are discovered during construction. There would be no impact.

3.2.19 Utilities and Service Systems

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Require or result in the relocation or construction of new or expanded water, wastewater, or storm water drainage, electric power, natural gas, or telecommunication facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐
b) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☐	☒
e) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

3.2.19.1 CEQA Significance Determinations for Utilities and Service Systems

a) Less Than Significant Impact

The proposed Project is a transportation improvement project. The proposed Project would not construct any new residential or non-residential structures that could induce population or employment growth and increase the demand or exceed the current capacity of existing utility systems.

Utilities would generally be protected in place or relocated on site. Numerous underground utilities are located within the Project limits. Most of these are at overpasses or underpasses and do not require relocation based on the preliminary widening design. There are overhead power and transmission lines that cross over the freeway that may be of concern during the use of tall construction equipment, such as cranes, but may not warrant relocation. The proposed Project improvements would result in the relocation of some major electrical and water utilities. The Project would require the relocation of the following utilities:

- Gas: Pacific Gas & Electric (PG&E)
- Electric: PG&E
- Water: East Bay Municipality Utility District (EBMUD)
- Fiber Optic: Bay Area Infrastructure Financing Authority (BAIFA), AT&T

- Cable TV: AT&T, Verizon
- Storm Drain and Sewer: Central Contra Costa Sanitary District (CCCSD)

CCTA would work with service providers and identify locations and needs for relocation permits. No interruption to utility services on a temporary basis would occur during or after construction of the proposed Project with the implementation of Measure **UES-1**, in Section 2.1.7, *Utilities/Emergency Services*, which would require continuous service to be maintained during the replacement or relocation of affected utilities within the proposed Project Study Limits. Further, implementation of Measure **UES-2**, in Section 2.1.7, *Utilities/Emergency Services*, would ensure that the location of all underground utilities be identified prior to ground disturbing activities so that these utilities would not be affected during construction. The Impact would be less than significant. Mitigation is not required.

b) No Impact

The Project would not induce new development or uses that would require water supplies. There would be no impact.

c) No Impact

The Project would not increase the demand for wastewater treatment or affect the capacity of wastewater treatment facilities. There would be no impact.

d) No Impact

The Project would generate solid waste during construction and maintenance. The Acme Landfill, which is located at 950 Waterbird Way in the City of Martinez, approximately 0.5 mile east of the Project Study Limits, is the closest landfill to the proposed Project. According to CalRecycle's Solid Waste Information System database (CalRecycle, 2022), the Acme Landfill permits a maximum capacity of 6,195,000 cubic yards of green material and construction/demolition waste. Waste from the Project would include concrete, asphalt, soil, and other similar materials. The amount of construction waste material anticipated to be disposed of in the Acme Landfill is not expected to exceed the landfill's permitted capacity. In addition, The Project is not anticipated to generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goal. There would be no impact.

e) No Impact

Construction waste generated under all Build Alternatives would be disposed of in accordance with federal, State, and local regulations related to recycling, which would minimize the amount of waste material entering local landfills. There would be no impact.

3.2.20 Wildfire

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☐	☒
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☒
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☒

3.2.20.1 CEQA Significance Determinations for Wildfire

As depicted in Figure 2.1.7-1, in Section 2.1.7, *Utilities/Emergency Services*, the Project Study Limits are not within a very high, high, or moderate fire hazard severity zone (CAL FIRE, 2023). There are fire hazard severity zones in the surrounding hills, particularly within and adjacent to the Acalanes Ridge Open Space, Briones Regional Park, Mount Diablo State Park, and Las Trampas Regional Wilderness. The nearest very high hazard severity zone is in a Local Responsibility Area that overlaps the Acalanes Ridge Open Space in Walnut Creek, approximately 0.7 mile west of the Project Study Limits.

a) Less Than Significant Impact

Contra Costa County has developed an Emergency Operations Plan that provides the basis for a coordinated response before, during, and after an emergency affecting Contra Costa County (Contra Costa County, 2015b). This plan applies to all unincorporated areas of Contra Costa County as well as incorporated areas that require a coordinated response to an emergency. Incorporated areas within Contra Costa County include the City of Martinez (the county seat) and an additional 18 communities within Contra Costa County.

The proposed Project under all Build Alternatives aims to improve system continuity, traffic congestion, and express lane network operations along northbound I-680. The proposed Project does not propose changes in the use of the current roadway and would not require or cause changes in the use of adjacent properties. However, during construction, the proposed Project would require shoulder, ramp, local road, freeway, and lane closures, which would result in temporary disruptions to local circulation and connectivity that could impact emergency access. A TMP would be prepared that would minimize potential traffic impacts as they relate to staged construction, detours, and other traffic handling concerns associated with construction of the proposed Project under all Build Alternatives. Therefore, the Project would not impair implementation of an emergency response or emergency evacuation plan. The impact would be less than significant. Mitigation is not proposed.

b) No Impact

The Contra Costa Emergency Operations Plan (Contra Costa County, 2015b) states that wildfire hazards exist in many areas of the county. Fire season generally lasts several months and varies year to year (Contra Costa County, 2015b). The Project would not change fire risk conditions along the I-680 corridor. During construction, measures for minimizing fire risks would be incorporated, such as clearing vegetation and trees from the work area or prohibiting the use of highly flammable chemicals in accordance with Measure **UES-3**, as described in Section 2.1.7, *Utilities/Emergency Services*. All Project construction would follow state and federal fire regulations. Therefore, the Project is not expected to exacerbate wildfire risks or expose project personnel to pollutants from a wildfire or the uncontrolled spread of a wildfire. There would be no impact.

c) No Impact

The Project includes widening northbound I-680 and would require relocation of some underground and aboveground utilities as described in Section 2.1.7, *Utilities/Emergency Services*. All project construction would follow State and federal fire regulations during these relocations. Project features for minimizing fire risks would be incorporated, such as clearing vegetation from the work area, prohibiting the use of highly flammable chemicals, following locally changing meteorological conditions, and maintaining awareness of the possibility of increased fire danger during the time work is in progress. Therefore, the Project is not expected to exacerbate wildfire risks or expose project personnel to pollutants from a wildfire or the uncontrolled spread of a wildfire. There would be no impact.

d) Less Than Significant Impact

As discussed in Section 2.2.1, *Hydrology and Floodplain*, and Section 2.2.2, *Water Quality*, the proposed Project under all Build Alternatives would propose new roadway hardscape area, which would result in a permanent increase in impervious surfaces and a permanent increase in runoff and pollutant loading. This increase in impervious area would increase the potential for erosion, sediment, and pollution in surface waters.

However, the proposed Project, under all Build Alternatives, would include upgrading existing drainage facilities and incorporating on-site treatment areas to manage the increase in runoff. Standard practices for erosion control and construction discharges, including the development and implementation of an SWPPP and erosion control BMPs, would be implemented during construction. Further, as discussed in Section 2.2.3, *Geology/Soils/Seismic/Topography*, Measure **GEO-1** would be implemented, which requires the preparation of a geotechnical report that would include geotechnical exploratory boring activities to confirm soil types and geologic conditions to address any potential impacts related to soils, liquefaction, and seismic activity during final design. The Project would not expose people or structures to significant risks related to downslope, flooding, or landslides as a result of runoff, post-fire slope instability, or drainage changes are not anticipated. The impact is less than significant. Mitigation is not proposed.

3.2.21 Mandatory Findings of Significance

	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☒	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☒	☐	☐	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

3.2.21.1 CEQA Significance Determinations for Mandatory Findings of Significance

a) Less than Significant Impact

The potential environmental impacts associated with Project construction and operation, under all Build Alternatives, and the measures proposed to avoid or minimize those impacts, are summarized in the checklist discussions above. Measures have been proposed to reduce impacts to resources, such as special-status wildlife species and their habitats. With implementation of the proposed measures, the Project would not 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. The impact would be less than significant. No additional mitigation measures are required.

b) Significant and Unavoidable

The Project, under all Build Alternatives, has been evaluated for cumulative impacts as described in Section 3.5, *Cumulative Impacts*. Alternatives 1C, 2, and 3 would not result in incremental effects to any resource that would be cumulatively considerable except for potentially VMT. As described in Section 3.2.17, *Transportation*, Alternatives 1C, 2, and 3 would all induce VMT. Alternative 2 has been selected as the preferred alternative. Although mitigation measures have been proposed, Caltrans has determined that the impacts on transportation would be significant and unavoidable. The Project's incremental effects, when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects, would be cumulatively considerable.

c) Less than Significant Impact

While human beings could be affected by a variety of the impacts described above, the Project would not have substantial adverse effects on human beings, either directly or indirectly. The proposed Project would include construction impacts that could affect human beings (e.g., construction noise and traffic delays), but these impacts would be short-term and not substantially adverse. With implementation of the proposed measures, the Project would not have substantially adverse effects on human beings. The impact would be less than significant. No additional mitigation measures are proposed.

3.3 WILDFIRE

3.3.1 Regulatory Setting

Senate Bill 1241 required the Office of Planning and Research, the Natural Resources Agency, and the California Department of Forestry and Fire Protection to develop amendments to the "CEQA Checklist" for the inclusion of questions related to fire hazard impacts for projects located on lands classified as very high fire hazard severity zones. The 2018 updates to the CEQA Guidelines expanded this to include projects "near" these very high fire hazard severity zones.

3.3.2 Affected Environment

As described in Section 2.1.7, *Utilities/Emergency Services*, the Project Study Limits are not within a very high, high, or moderate fire hazard severity zone (FHSZ) (CAL Fire, 2007) (see Figure 2.1.7-1, *Fire Hazard Severity Zones and Emergency Services*). However, there are FHSZs in the surrounding hills, particularly within and adjacent to the Acalanes Ridge Open Space, Briones Regional Park, Mount Diablo State Park, and Las Trampas Regional Wilderness.

Contra Costa County has developed an Emergency Operations Plan that provides the basis for a coordinated response before, during, and after an emergency affecting Contra Costa County (Contra Costa County, 2015). This plan applies to all unincorporated areas of Contra Costa County as well as incorporated areas that require a coordinated response to an emergency. Incorporated areas within Contra Costa County include the City of Martinez (the county seat) and 18 additional communities within Contra Costa County.

3.3.3 Environmental Consequences

3.3.3.1 No-Build Alternative

The No-Build Alternative would maintain the current configurations of Interstate 680 (I-680) in the Community Impact Study Area. Under the No-Build Alternative, the proposed Project would not be constructed, no impacts on emergency response or evacuation would occur, and the fire hazard risk in the Project area would not change.

3.3.3.2 Build Alternatives (Alternatives 1C, 2, 3, and 5)

None of the Build Alternatives would impair implementation of an emergency response or emergency evacuation plan. Most of the work would occur in State right-of-way. All of the Build Alternatives would reduce travel time, which could support a decrease in emergency response time. In addition, Alternatives 1C, 2, and 3 would add capacity to northbound I-680, potentially facilitating emergency response and evacuation. The proposed added infrastructure, such as changeable message signs and traffic monitoring, could be leveraged by first responders in coordination with Caltrans during

an evacuation to assist with the flow of emergency traffic. Alternatives 1C, 2, and 3 would also improve I-680 as a firebreak by increasing the overall freeway width and removing roadside vegetation. In addition, all of the Build Alternatives would construct and maintain biofiltration strips and swales along the I-680 corridor.

During Project construction, the Transportation Management Plan would minimize construction-related delays and include coordination with California Highway Patrol and local law enforcement agencies. In addition, Measure **UES-3** (See Section 2.1.7, *Utilities/Emergency Services*) would be implemented. Measure **UES-3** requires coordination with California Department of Forestry and Fire Protection and posting emergency service numbers in work areas, which would reduce fire risks during construction activities. All Build Alternatives propose to install new lighting, conduits, and associated utility cabinets. Electrical equipment would be sited, installed, grounded, and protected by circuit breakers in compliance with Caltrans Standard Plans, local utility requirements, and applicable national fire protection standards. Cabinets would be rated to protect electrical equipment from damage and placed on raised concrete pads in unpaved areas in accordance with applicable standards. Therefore, installation and maintenance of associated infrastructure is not anticipated to increase the risk of wildland fires.

3.3.4 Avoidance, Minimization, and/or Mitigation Measures

Measure **UES-3**, as described in Section 2.1.7, *Utilities/Emergency Services*, would be implemented. No additional avoidance, minimization, and/or mitigation would be required.

3.4 CLIMATE CHANGE

Climate change refers to long-term changes in temperature, precipitation, wind patterns, and other elements of the Earth's climate system. The Intergovernmental Panel on Climate Change, established by the United Nations and World Meteorological Organization in 1988, is devoted to greenhouse gas (GHG) emissions reduction and climate change research and policy. Climate change in the past has generally occurred gradually over millennia, or more suddenly in response to cataclysmic natural disruptions. The research of the Intergovernmental Panel on Climate Change and other scientists over recent decades, however, has unequivocally attributed an accelerated rate of climatological changes over the past 150 years to GHG emissions generated from the production and use of fossil fuels.

Human activities generate GHGs consisting primarily of carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), tetrafluoromethane, hexafluoroethane, sulfur hexafluoride (SF_6), and various hydrofluorocarbons (HFCs). CO_2 is the most abundant GHG; while it is a naturally occurring and necessary component of Earth's atmosphere, fossil-fuel combustion is the main source of additional, human-generated CO_2 that is the main driver of climate change. In the United States (U.S.) and in California, transportation is the largest source of GHG emissions, mostly CO_2.

The impacts of climate change are already being observed in the form of sea level rise, drought, extended and severe fire seasons, and historic flooding from changing storm patterns. The most important strategy to address climate change is to reduce GHG emissions. Additional strategies are necessary to mitigate and adapt to these impacts. In the context of climate change, "mitigation" involves actions to reduce GHG emissions to lessen adverse impacts that are likely to occur. "Adaptation" is planning for and responding to impacts to reduce vulnerability to harm, such as by adjusting transportation design standards to withstand more intense storms, heat, and higher sea levels. This analysis will include a discussion of both in the context of this transportation project.

3.4.1 Regulatory Setting

For a full list of laws, regulations, and guidance related to climate change (GHGs and adaptation), please refer to Caltrans' Standard Environmental Reference, Chapter 16, Climate Change.

3.4.1.1 Federal

To date, no nationwide numeric mobile-source GHG reduction targets have been established; however, federal agencies are mandated to consider the effects of climate change in their environmental reviews.

The National Environmental Policy Act (NEPA) (42 United States Code [USC] Part 4332) is the basic national charter for protection of the environment, and it establishes

policy, sets goals, and provides direction for carrying out the policy. NEPA requires federal agencies to assess the environmental effects of their proposed actions prior to making a decision on the action or project. In May 2024, the White House Council on Environmental Quality (CEQ) issued the National Environmental Policy Act Implementing Regulations Revisions Phase 2 (89 Fed. Reg. 35442). *Please note: The NEPA Phase II regulations that required climate change to be analyzed were rescinded pursuant to the Removal of NEPA Implementing Regulations Council on Environmental Quality Interim Rule (effective April 11, 2025).*

The Federal Highway Administration (FHWA) recognizes the threats that extreme weather, sea level rise, 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 (Federal Highway Administration, 2022). This approach encourages planning for sustainable highways by addressing climate risks while balancing environmental, economic, and social values— "the triple bottom line of sustainability" (Federal Highway Administration, n.d.). 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.

Early efforts by the federal government to improve fuel economy and energy efficiency to address climate change and its associated effects include the Energy Policy and Conservation Act of 1975 (42 USC Section 6201); and Corporate Average Fuel Economy (CAFE) Standards. The U.S. Department of Transportation's National Highway Traffic and Safety Administration sets and enforces the CAFE standards for on-road motor vehicles sold in the United States. The Environmental Protection Agency (U.S. EPA) calculates average fuel economy levels for manufacturers and also sets related GHG emissions standards for vehicles under the Clean Air Act. Raising CAFE standards leads automakers to create a more fuel-efficient fleet, which improves our nation's energy security, saves consumers money at the pump, and reduces GHG emissions (U.S. Department of Transportation, 2014). These standards are periodically updated and published through the federal rulemaking process.

3.4.1.2 State

California has been innovative and proactive in addressing GHG emissions and climate change by passing multiple Senate and Assembly bills and executive orders (EOs).

In 2005, EO S-3-05 initially set a goal to reduce California's GHG emissions to 80 percent below year 1990 levels by 2050, with interim reduction targets. Later EOs and Assembly and Senate bills refined interim targets and codified the emissions reduction goals and strategies. The California Air Resources Board (CARB) was directed to create a climate change scoping plan and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." Ongoing GHG emissions reduction was also mandated in Health and Safety Code (H&SC) Section 38551(b). In 2022, the

California Climate Crisis Act was passed, establishing state policy to reduce statewide human-caused GHG emissions by 85 percent below 1990 levels, achieve net zero GHG emissions by 2045, and achieve and maintain negative emissions thereafter.

Beyond GHG reduction, the State maintains a climate adaptation strategy to address the full range of climate change stressors and passed legislation requiring State agencies to consider protection and management of natural and working lands as an important strategy in meeting the State's GHG reduction goals.

3.4.2 Environmental Setting

The Project's operational limits extend approximately 12.4 miles along I-680 within central Contra Costa County. The Project limits traverse through several cities and towns within Contra Costa County, including Concord, Martinez, Pleasant Hill, and Walnut Creek and the community of Alamo. As a result, most of the land adjacent to northbound I-680 provides space for commercial/retail, residential, and light industrial uses. However, near the Benicia-Martinez Bridge Toll Plaza, I-680 is adjacent to heavy industrial land uses.

Northbound I-680 is used heavily during peak hours. As described in Section 2.1.8, *Traffic and Transportation/Pedestrian and Bicycle Facilities*, there is considerably more congestion during the afternoon peak period than during the morning peak period; however, there are still traffic delays and queues in the morning peak period. The morning congestion is comparatively moderate and only lasts for approximately an hour (8:00 a.m. to 9:00 a.m.). In the afternoon, traffic congestion appears to set in around 2:00 p.m. and lasts until around 7:00 p.m. There is also substantially more congestion (traffic delays) in the general-purpose lanes than in the express lanes in the southern segment of the corridor. Likewise, the high-occupancy vehicle (HOV) lane in the northern segment is less congested (i.e., has higher traffic speeds) than the adjacent general-purpose lanes.

Plan Bay Area 2050, which is the regional transportation plan (RTP)/sustainable communities strategy (SCS) of the Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments (ABAG), guides transportation development for the nine-county San Francisco Bay Area (Association of Bay Area Governments and Metropolitan Transportation Commission, 2021). The Bay Area Air Quality Management District's (BAAQMD) *2017 Clean Air Plan* addresses GHGs in the Project region (Bay Area Air Quality Management District, 2017).

3.4.2.1 GHG Inventories

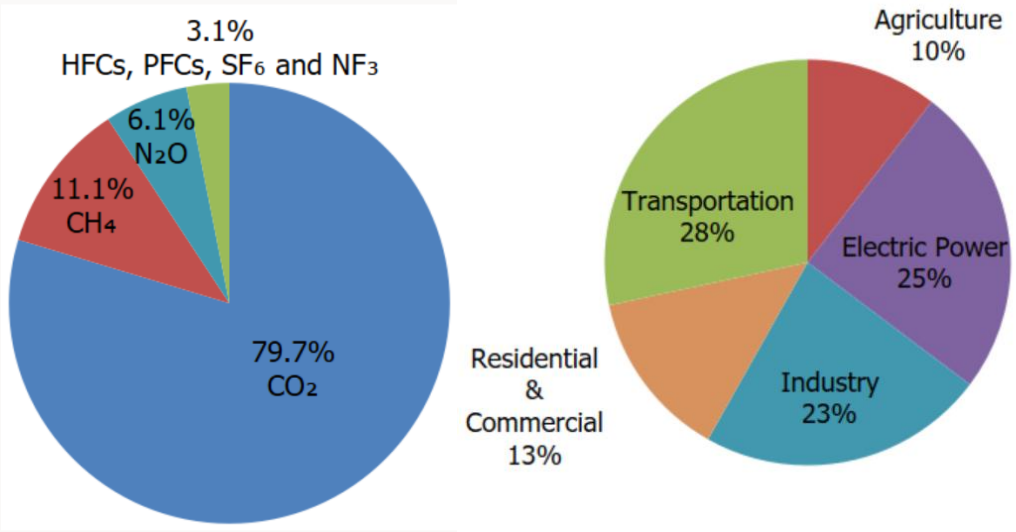
A GHG emissions inventory estimates the amount of GHGs discharged into the atmosphere by specific sources over a period of time. Tracking annual GHG emissions allows countries, states, and smaller jurisdictions to understand how emissions are changing and what actions may be needed to attain emission 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. Cities and other local jurisdictions may

also conduct local GHG inventories to inform their GHG reduction or climate action plans.

National GHG Inventory

The annual GHG inventory submitted by the U.S. EPA to the United Nations provides a comprehensive accounting of all human-produced sources of GHGs in the United States. Total national GHG emissions from all sectors in 2022 were 5,489.0 million metric tons (MMT), factoring in deductions for carbon sequestration in the land sector. Land Use, Land-Use Change, and Forestry provide a carbon sink equivalent to 15 percent of total U.S. emissions in 2022 (U.S. Environmental Protection Agency, 2024). While total GHG emissions in 2022 were 17 percent below 2005 levels, they increased by 1 percent over 2021 levels. Of these, 80 percent were CO_2, 11 percent were CH_4, and 6 percent were N_2O; the balance consisted of fluorinated gases. From 1990 to 2022, CO_2 emissions decreased by only 2 percent (U.S. Environmental Protection Agency, 2024).

The transportation sector's share of total GHG emissions remained at 28 percent in 2022 and remains the largest contributing sector (Figure 3.4-1). Transportation activities accounted for 37 percent of U.S. CO_2 emissions from fossil fuel combustion in 2022. This is a decrease of 0.5 percent from 2021 (U.S. Environmental Protection Agency, 2024).

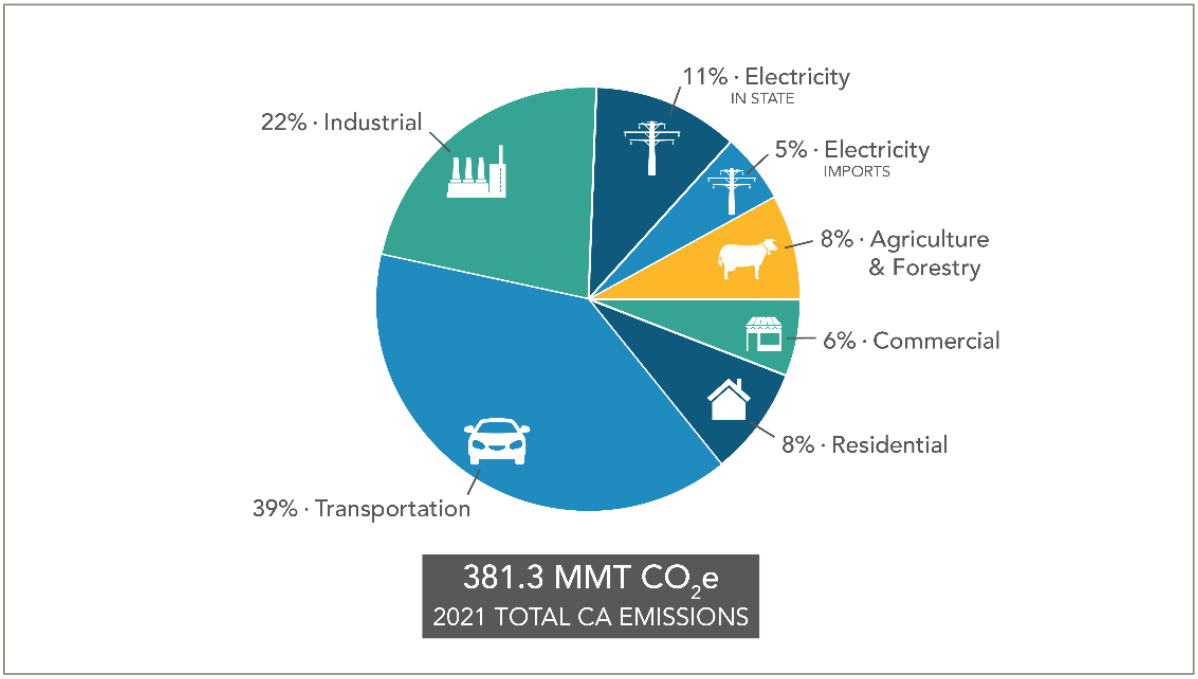


Source: (U.S. Environmental Protection Agency, 2024)

Figure 3.4-1. United States 2022 Greenhouse Gas Emissions

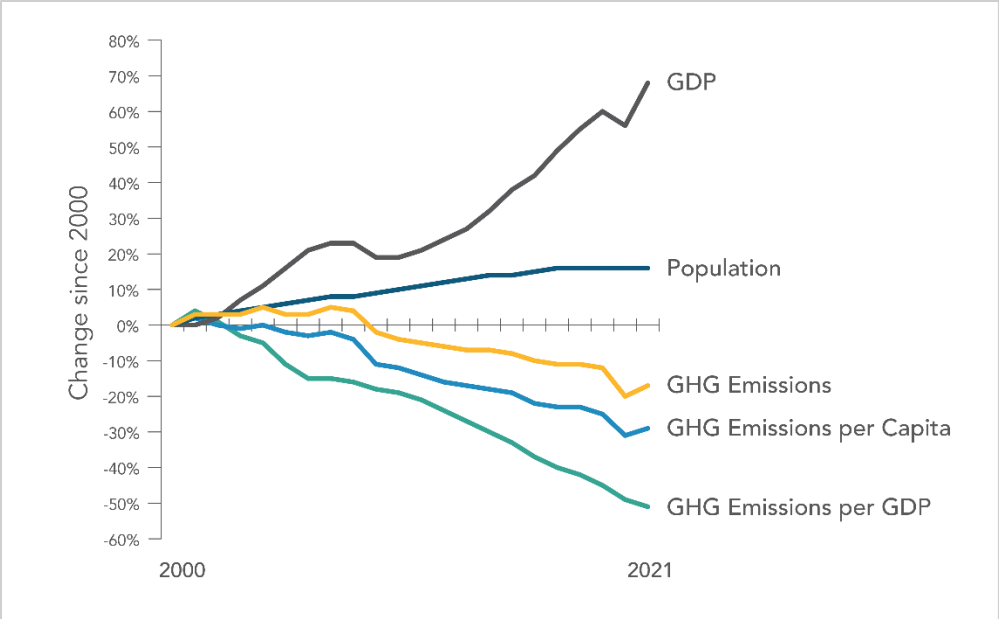
State GHG Inventory

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. Overall statewide GHG emissions declined from 2000 to 2021 despite growth in population and state economic output (Figure 3.4-2) (California Air Resources Board, 2023)



Source: (California Air Resources Board, 2023) (California Air Resources Board, 2022a)

Figure 3.4-2. California 2021 Greenhouse Gas Emissions by Economic Sector



Source: (California Air Resources Board, 2023) (California Air Resources Board, 2022a)

Figure 3.4-3. Change in California GDP, Population, and GHG Emissions since 2000

Assembly Bill (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. The AB 32 Scoping Plan and the subsequent updates contain the main strategies California will use to reduce GHG emissions. 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 *2022 Scoping Plan for Achieving Carbon Neutrality*, adopted September 2022, assesses progress toward the statutory 2030 reduction goal and defines a path to reduce human-caused emissions to 85 percent below 1990 levels and achieve carbon neutrality no later than 2045, in accordance with AB 1279 (California Air Resources Board, 2022a).

3.4.2.2 Regional Plans

As required by *The Sustainable Communities and Climate Protection Act of* 2008, CARB sets regional GHG reduction targets for California's 18 metropolitan planning organizations (MPOs) to achieve through planning future projects that will cumulatively achieve those goals, and reporting how they will be met in the RTP/SCS. Targets are set at a percent reduction of passenger vehicle GHG emissions per person from 2005 levels. The Project is included in *Plan Bay Area 2050*, the RTP/SCS for the nine-county San Francisco Bay Area region. The regional reduction target for MTC/ABAG is 19 percent by 2035 (California Air Resources Board, 2022c).

Table 3.4.2-1 provides a summary of GHG reduction policies or strategies from the RTP/SCS and other regional and local climate action plans in the Project area.

Table 3.4.2-1. Regional and Local Greenhouse Gas Reduction Plans

Title	GHG Reduction Policies or Strategies
Plan Bay Area 2050, adopted in October 2021 (Association of Bay Area Governments and Metropolitan Transportation Commission, 2021)	*Plan Bay Area 2050* would meet the state mandate of a 19 percent reduction in per capita emissions by 2035. The RTP/SCS includes the following transportation strategies that would help reduce GHG emissions: • T1. Restore, operate, and maintain the existing system. • T2. Support community-led transportation enhancements in Equity Priority Communities. • T3. Enable a seamless mobility experience. • T4. Reform regional transit fare policy. • T5. Implement per-mile tolling on congested freeways with transit alternatives. • T6. Improve interchanges and address highway bottlenecks. • T7. Advance other regional programs and local priorities. • T8. Build a Complete Streets network. • T9. Advance regional Vision Zero policy through street design and reduced speeds. • T10. Enhance local transit frequency, capacity, and reliability. • T11. Expand and modernize the regional rail network. • T12. Build integrated regional express lanes and an express bus network.
Bay Area Air Quality Management District's *Spare the Air, Cool the Climate (Clean Air Plan)*, adopted in April 2017 (Bay Area Air Quality Management District, 2017)	The BAAQMD's *Clean Air Plan* defines a multi-pollutant control strategy to reduce emissions, including GHG. The control strategy encompasses 85 individual control measures that describes specific actions to reduce air and climate pollutant emissions. Consistent with the GHG reduction targets adopted by the state of California, the plan would reduce Bay Area GHG emissions 40 percent below 1990 levels by 2030 and 80 percent below 1990 levels by 2050.
Contra Costa County Municipal Climate Action Plan, adopted in December 2008 (Contra Costa County, 2008)	The 2008 *Climate Action Plan* presents a GHG reduction target of 50 percent below baseline levels by 2030 for County municipal operations that would keep the County on track toward the long-term target of 80 percent by 2050. Contra Costa County has already implemented many measures that have reduced its municipal GHG emissions. The Plan suggests potential GHG reduction measures to further reduce GHG emissions.
Contra Costa County Climate Action Plan, adopted in December 2015 (Contra Costa County , 2015)	The 2015 *Climate Action Plan* presents a 2020 GHG reduction target consistent with AB 32 and the AB 32 Scoping Plan, which is to reduce community-wide emissions 15 percent below 2005 levels by 2020. The Plan provides a set of GHG reduction measures to achieve the 2020 reduction target.
City of Martinez 2035 General Plan, adopted in November 2022 (City of Martinez, 2022)	The *City of Martinez 2035 General Plan* includes the following measures that would help reduce GHG emissions to exceed or meet the requirements of AB 32 and SB 375:

Title	GHG Reduction Policies or Strategies
	• Measure NA-I-9.1a: Review and adjust City policies to be consistent with the Climate Action Plan (CAP). • Measure NA-I-9.1b: Update the CAP to address the following: (a) quantify base year GHG emissions levels in Martinez; (b) establish GHG reduction targets that meet the targets established by SB 32; (c) adopt policies and programs to achieve the GHG targets; and (d) establish an implementation and monitoring program to track effectiveness. • Measure NA-I-9.1c: Continue to work with local agencies to reduce emissions. • Measure NA-9.1d: Review state goals for GHG reductions and provide a report to City Council every 5 years or as deemed necessary. • Measure NA-9.1e: Continue to monitor federal, State, and local activities related to climate change activities. • Measure NA-9.1f: To the extent practical, require new development projects to comply with the GHG reduction strategies and programs of the City's *Climate Action Plan*.
City of Martinez Climate Action Plan, adopted in June 2009 (City of Martinez, 2009)	The *City of Martinez Climate Action Plan* includes the following transportation-related strategies that would help reduce GHG emissions: • Program T1: Safe Route to Schools • Program T2: Zone and Code for Neighborhoods Serving Commercial Areas • Program T3: Community-Based Carpool and Ride Share Program • Program T4: Pursue Alternative Mass Transit Options • Program T5: Implement the Downtown Martinez Community-Based Transportation Plan • Program T6: Improve Vehicle Fuel Efficiency through Community Education • Program T7: Find Funding to Replace City Vehicles with Low-Emissions Alternatives • Program T8: Replace City Tools and Equipment with More Energy-Efficient Alternatives • Program T9: Upgrade Signal Timers • Program T10: Designated Motorcycle and Scooter Parking Downtown • Program T11: Develop Alternative and Flexible-Fuel Vehicle Power/Fuel Sources
City of Concord 2030 General Plan, adopted in October 2007 (City of Concord, 2007)	The *City of Concord General Plan* includes the following policies that would help reduce GHG emissions: • Policy S-1.4.1: Prepare and implement climate action plans for the Concord Reuse Project site and for the city as a whole

Title	GHG Reduction Policies or Strategies
	to reduce GHG emissions associated with future development and existing urban activities. • Policy T-1.1.2: Maintain and upgrade transportation systems to provide smooth traffic flow, minimize vehicle emissions, and save energy.
City of Concord Citywide Climate Action Plan, adopted in July 2013 (City of Concord, 2013)	The *City of Concord Citywide Climate Action Plan* established a 2005 baseline of 928,497 metric tons of carbon dioxide equivalent ($MTCO_2e$) and includes 26 transportation systems and land use strategies to meet the City's 2020, 2030, and 2035 GHG reduction targets. These strategies are centered on the following concepts: • Creating complete streets that serve all people traveling in Concord • Priority for active modes and public transit in funding and use of streets • Support for carsharing (an alternative to owning a car) • Roadway safety enhancements through education and law enforcement • Cleaner-burning buses • More efficient bus service • Density and mix of land uses, especially in targeted areas of Concord • Walk-friendly design (including reduced street-front parking lots and smaller block sizes) • End-of-trip amenities for preferred travel modes (like showers for active commuters, and preferred carpool parking spots at job locations)
City of Pleasant Hill General Plan 2003, adopted in July 2003 (City of Pleasant Hill, 2003)	The *City of Pleasant Hill General Plan* includes the following policies that would help reduce GHG emissions: • Safety and Noise Program 8.3. Synchronize traffic signals on roads susceptible to high emission levels from idling vehicles. • Safety and Noise Program 8.4. Utilize alternative-fuel vehicles in the City fleet. • Safety and Noise Program 8.5. Give preference to firms using reduced-emission equipment for City contracts, including for services such as trash collection.
City of Walnut Creek General Plan 2025, adopted in April 2006 (City of Walnut Creek, 2006)	The *City of Walnut Creek General Plan* includes the following actions that would help reduce GHG emissions: • Action 31.1.1: Support local transportation control measures (TCM) and other ideas in the latest *Bay Area Clean Air Plan*. • Action 31.1.2: Develop a local, voluntary *Clean Air Plan*. • Action 31.1.3: Participate in the BAAQMD Spare the Air program.

Title	GHG Reduction Policies or Strategies
City of Walnut Creek Climate Action Plan, adopted in April 2012 (City of Walnut Creek, 2012)	The *City of Walnut Creek Climate Action Plan* established a GHG reduction target of 15 percent below the baseline 2005 GHG emissions levels by 2020. The Plan presents goals and measures related to energy, transportation, and waste reduction, which have the potential to reduce GHG emissions by 104,747 $MTCO_2e$ by 2020. With the incorporation of State-mandated initiatives, the City would meet the 2020 GHG reduction target.
Town of Danville 2030 General Plan, adopted in March 2013 (Town of Danville, 2013)	The *Town of Danville General Plan* includes the following transportation-related policies that would help reduce GHG emissions: • 33.01: Make land use and transportation decisions that promote walking and bicycling and help to sustain public transportation. • 33.02: Encourage reductions in the number of residents commuting in and out of Danville by car. This can be achieved in part by providing a better balance between jobs and housing and providing housing that is responsive to the types of jobs that exist in Danville. • 33.03: Support programs by local employers that encourage employees to carpool, use public transportation, telecommute, or pursue other alternatives to driving alone to work.
Town of Danville Climate Action Plan, adopted in May 2009 (Town of Danville, 2009)	The *Town of Danville Climate Action Plan* established a goal of reducing the City's 2009 level of GHG emissions by 15 percent by the year 2020. The plan includes the following transportation-related goals that would help reduce GHG emissions: • Implement transportation planning processes that enhance an efficient transportation system in the Town and region. • Improve infrastructure and Transportation Systems Management (TSM). • Promote alternatives to single occupant auto commuting.
City of San Ramon General Plan 2035, adopted in April 2015, last amended in October 2019 (City of San Ramon, 2019)	The *City of San Ramon General Plan* includes the following transportation-related policies that would help reduce GHG emissions: • 12.7-G-1: Invest in more efficient and effective transportation infrastructure, City fleet management, and support for trip reduction programs to reduce traffic congestion, vehicle trips, and the need for costly new or expanded roadways. • 12.7-I-4: Provide information to encourage the use of transportation modes that minimize motor vehicle use and the resulting air pollution and GHG emissions. • 12.7-I-5: Construct and promote infrastructure and facilities that support and encourage the use of low-emission transportation and alternative modes of travel, including a safe and comprehensive bicycle and pedestrian system that connects all parts of the city.

Title	GHG Reduction Policies or Strategies
City of San Ramon Climate Action Plan, adopted in August 2011 (City of San Ramon, 2011)	The *City of San Ramon Climate Action Plan* would achieve an overall GHG reduction of 27.6 percent, which includes the benefits from new development and statewide measures compared with business as usual in 2020. This demonstrates consistency with the *CARB Climate Change Scoping Plan* target for development related sources of 26.2 percent in 2020. The project reductions would be achieved through land use related measures, such as increased density (e.g., multi-story buildings, multi-family housing, and small lot single family), pedestrian and transit-oriented development, support for alternative transportation modes, and measures that reduce energy consumption through improved energy efficiency in buildings, water conservation, and waste reduction.

3.4.3 Project Analysis

GHG emissions from transportation projects can be divided into those produced during operation and use of the State Highway System (operational emissions) and those produced during construction. The primary GHGs produced by the transportation sector are CO_2, CH_4, N_2O, and HFCs. CO_2 emissions are a product of burning gasoline or diesel fuel in internal combustion engines, along with relatively small amounts of CH_4 and N_2O. A small amount of HFC emissions related to refrigeration is also included in the transportation sector. GHGs differ in how much heat each traps in the atmosphere, called global warming potential, or GWP. CO_2 is the most important GHG, so amounts of other gases are expressed relative to CO_2, using a metric called "carbon dioxide equivalent," or CO_2e. The global warming potential of CO_2 is assigned a value of 1, and the GWP of other gases is assessed as multiples of CO_2.

The California Environmental Quality Act (CEQA) Guidelines generally address GHG emissions as a cumulative impact due to the global nature of climate change (Public Resources Code Section 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).

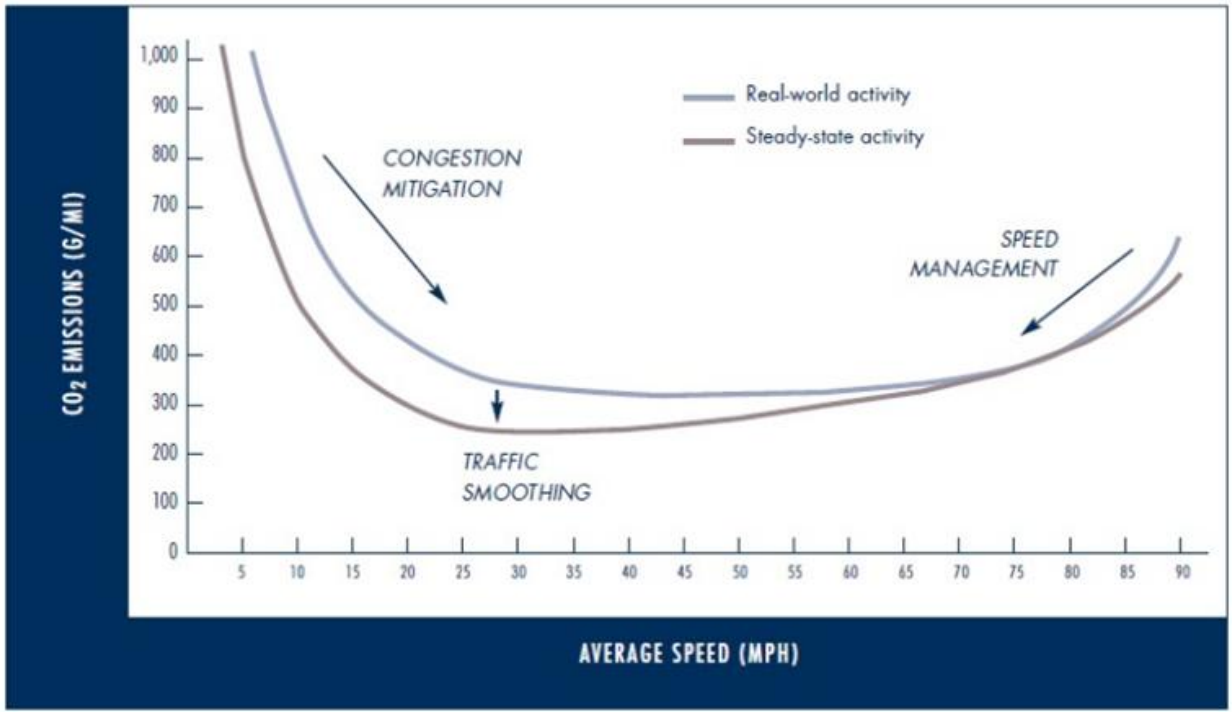
To make this determination, the incremental impacts of the project must be compared with the effects of past, current, and probable future projects. Although climate change is ultimately a cumulative impact, not every individual project that emits GHGs must necessarily be found to contribute to a significant cumulative impact on the environment.

3.4.3.1 Operational Emissions

The National GHG Inventory for 2022 reported that 80 percent of all U.S. GHG emissions in 2022 consisted of CO_2, and fossil fuel combustion for transportation accounted for 35 percent of those CO_2 emissions. Most (37 percent) transportation-related CO_2 was from operating light-duty vehicles, 23 percent was from medium- and heavy-duty trucks and buses, and 20 percent was from passenger cars. The remainder of emissions came from other modes and off-road sources (U.S. Environmental Protection Agency, 2024). Because CO_2 emissions represent the greatest percentage of GHG emissions, it has been selected as a proxy for the following analysis for potential climate change impacts.

The highest levels of CO_2 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 3.4-4). To the extent that a project enhances operational efficiency and improves travel times in high-congestion travel corridors, GHG emissions, particularly CO_2, may be reduced, provided that improved travel times do not induce additional vehicle miles traveled (VMT).

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 and efficiency. To be most effective, all four strategies should be pursued concurrently.



Source: (Barth, Matthew and Kanok Boriboonsomsin, 2010)

Figure 3.4-4. Possible Use of Traffic Operation Strategies in Reducing On-Road CO_2 Emissions

Plan Bay Area, the 2013 RTP for the nine-county Bay Area, called for a 550-mile regional network of express lanes to be completed by 2035. The plan includes express lanes on I-680 in the project corridor (Association of Bay Area Governments and Metropolitan Transportation Commission, 2013). The goals of the regional express lane network include using express lane toll revenue to close gaps within the HOV lane system and to increase travel-time savings for carpools and buses and optimizing throughput on freeway corridors to better meet current and future traffic demands.

The Project is listed in the *Plan Bay Area 2050* financially constrained RTP as project 21-T12-116 (Express Lanes – Regional). The Project is also included MTC's financially constrained 2025 Transportation Improvement Program (TIP) and Transportation-Air Quality Conformity Analysis as project TIP ID CC-170017 (I-680 Northbound Express Lane Completion). MTC forwarded the 2025 TIP to Caltrans to be included in the 2023 Federal-Statewide Transportation Improvement Program (FSTIP) by reference. The State approved the 2025 FSTIP on November 15, 2024. FHWA and FTA approved the 2025 FSTIP in December 2024..

The Project is part of CCTA's INNOVATE 680 Program, which includes a strategy to improve transit service and freeway operations with technology and infrastructure investments to enhance mobility. In 2004, Contra Costa voters approved Measure J, which provided for the continuation of the half-cent transportation sales tax. The proposed Project is an element within the voter-approved expenditure plan for Measure J.

The purpose of the Project is to reduce peak-period congestion and delay on northbound I-680, reduce travel time and improve travel time reliability for travelers in the corridor, encourage use of HOV and transit service, optimize use of the existing HOV lane capacity in the I-680 corridor to better meet current and future traffic demands, and offer non-carpool eligible drivers a reliable travel time option.

The Project is needed to address existing transportation deficiencies within the Project Study Limits related to congestion, system continuity, and operational improvements. There is a 7.5-mile gap in the existing northbound I-680 managed lane system between Livorna Road and SR-242. System continuity is lacking through this area, diminishing the effectiveness of the managed lane system, and increasing travel time for all users. There is also weaving movement between Lawrence Way and Treat Boulevard that creates a bottleneck on I-680 and a traffic queue as far back as Livorna Road during the peak traffic period. The situation is compounded by the gap in the managed lane system.

Chapter 1 describes the development of the alternative planning process for the Project. Transit-only alternatives were eliminated from consideration because they would not meet the Project's purpose and need. As described in Section 1.4.1.7, *Transportation System Management, Transportation Demand Management, and Mass Transit Alternatives*, although these strategies alone would not meet the purpose and need, Transportation Systems Management (TSM), Transportation Demand Management (TDM), and mass transit strategies are being incorporated into the Build Alternatives

directly or as mitigation. For example, all Build Alternatives would include the following TSM measures: monitor traffic speed, density, and enforcement; incident management; and other subsystems to maintain acceptable traffic flow in the express lane.

Quantitative Analysis

CARB developed the EMission FACtors (EMFAC) model to facilitate preparation of statewide and regional mobile source emissions inventories. The model generates emissions rates that can be multiplied by vehicle activity data from all motor vehicles, from passenger cars to heavy-duty trucks operating on highways, freeways, and local roads in California. EMFAC has a rigorous scientific foundation, has been approved by U.S. EPA, and has been vetted through multiple stakeholder reviews. Caltrans developed CT-EMFAC to apply project-specific factors to CARB's model.

EMFAC's GHG emission rates are based on tailpipe emissions test data and the model does not account for factors such as the rate of acceleration and vehicle aerodynamics, which influence the amount of emissions generated by a vehicle. GHG emissions quantified using CT-EMFAC are therefore estimates and may not reflect actual on-road emissions. Furthermore, the model does not account for induced travel. Modeling GHG estimates with EMFAC or CT-EMFAC nevertheless remains the most precise means of estimating future GHG emissions. While CT-EMFAC is currently the best available tool for calculating GHG emissions from mobile sources, it is important to note that the GHG results are only useful for a comparison of alternatives.

The VMT analysis, as described in Section 3.2.17, *Transportation*, found that the project would induce demand in the opening year and design year for Alternatives 1C, 2, and 3 (Table 3.4.3-1). Alternative 5 was not required to undergo VMT analysis after being screened from SB 743 compliance; however, GHG emissions were calculated for the purpose of climate change analysis. GHG emissions impacts for the No-Build and Build Alternatives were computed using CT-EMFAC2021 for the existing year and future years (Table 3.4.3-1) based on the VMT forecasts and speed data provided (without mitigation). This travel forecast was generated using the Contra Costa Countywide travel model. Revisions were made to the Countywide Model to ensure that the most important travel behavior changes would be represented, which included express lane modeling, HOV modeling, and induced demand adjustments. Additional details regarding the VMT forecast methodology are summarized in Section 2.1.8, *Traffic and Transportation/Pedestrian and Bicycle Facilities*, and the Project's *Travel Forecast Report*, completed in February 2022 (Kittelson & Associates and DKS Associates, 2022).

The comparison of design year to existing year emissions is the basis of a CEQA significance determination. For NEPA, the 2024 CEQ Implementing Regulations Revisions Phase 2 provides additional ways of communicating project effects related to GHG emissions and climate change, such as quantifying reasonably foreseeable GHG emissions, where feasible; monetizing climate change effects; explaining how the proposed action and alternatives would help meet or detract from achieving relevant climate action goals and commitments; summarizing scientific literature to help explain

the real-world effects associated with an increase in GHG emissions; or providing accessible comparisons or equivalents.

All of the Build Alternatives would have lower overall GHG emissions when compared to baseline conditions. Over time, with or without implementation of the Project, mobile source GHG emissions in the region are forecast to decrease due to the improvements in vehicle technology and reformulation of fuels (Table 3.4.3-1).

Table 3.4.3-1. Modeled Annual CO_2e Emissions and Vehicle Miles Traveled by Alternative

Alternative	Modeled CO_2e Emissions (metric tons/year)	Difference Build vs. No Build (metric tons/year)	Change from Existing/ Baseline + or - (metric tons/year)	Annual Vehicle Miles Traveled [a]
Existing/Baseline 2020	14,761,127	-	-	33,553,289,170
Open to Traffic – Opening Year 2027				
No-Build	13,168,965	-	-1,592,162	35,692,277,106 [b]
Build Alternative 1C	13,180,049	11,084	-1,581,079	35,714,090,255
Build Alternative 2	13,180,715	11,749	-1,580,413	35,712,053,293
Build Alternative 3	13,177,600	8,634	-1,583,528	35,715,074,196
Build Alternative 5	13,011,002	-157,964	-1,750,126	35,692,277,106
20-Year Horizon – Design Year 2047				
No-Build	11,488,202	-	-3,272,925	39,940,377,641
Build Alternative 1C	11,494,827	6,625	-3,266,301	39,975,814,099
Build Alternative 2	11,491,448	3,247	-3,269,679	39,969,663,653
Build Alternative 3	11,495,633	7,431	-3,265,495	39,976,113,312
Build Alternative 5	11,358,537	-129,665	-3,402,591	39,945,052,618

Alternative	Modeled CO_2e Emissions (metric tons/year)	Difference Build vs. No Build (metric tons/year)	Change from Existing/ Baseline + or - (metric tons/year)	Annual Vehicle Miles Traveled [a]

Source: (Illingworth & Rodkin, Inc., 2023). Table 21 - Modeled Annual CO_2e Emissions and Vehicle Miles Traveled, Air Quality Report. Calculations use CT-EMFAC 2021 version 1.0.2.0, 2023
Notes: CO_2e = carbon dioxide equivalent including carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and hydrofluorocarbons (HFCs) adjusted by their global warming potentials in IPCC's 4th Assessment Report.
[a] Annual vehicle miles traveled (VMT) values derived from Daily VMT values multiplied by 347, per CARB methodology (Illingworth & Rodkin, Inc., 2023). VMT estimate is unmitigated.
[b] Daily VMT data were provided by Kittelson & Associates on February 16, 2022. Kittelson subsequently reduced the VMT for the No-Build Opening Year (2027) from 102,859,588 to 102,853,478 due to a correction in the workbook that was used for air quality analysis (see Section 3.2.17, *Transportation*). For emission estimates, this difference would be statistically insignificant and would not change the findings in the Air Quality Report given the uncertainties of the travel demand model and emissions model or the CEQA determinations.

When compared to the No-Build Alternative (Design Year), Alternatives 1C, 2, and 3 would have slightly higher (i.e., less than a 1 percent increase) GHG emissions for all analysis years due to the slight (i.e., less than 0.1 percent) increase in VMT associated with each Build Alternative (Table 3.4.3-1). Alternative 5, which would not increase highway capacity, would result in lower (1 percent less) GHG emissions than the No-Build Alternative (Table 3.4.3-1). None of the proposed Build Alternatives would change the percentage of truck traffic in the region.

3.4.3.2 Construction Emissions

Construction GHG emissions would result from material processing and transportation, on-site construction equipment, and traffic delays due to construction. These emissions would 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. While construction GHG emissions are only produced for a short time, they have long-term effects in the atmosphere, so cannot be considered "temporary" in the same way as criteria pollutants that subside after construction is completed.

Use of long-life pavement, improved traffic management plans, and changes in materials can also help offset GHG emissions produced during construction by allowing longer intervals between maintenance and rehabilitation activities.

Construction GHG emissions were calculated using Caltrans Construction Emissions Tool (Cal-CET) (Illingworth & Rodkin, Inc., 2023). Total construction GHG emissions would be approximately 9,640 $MTCO_2e$ over the course of 528 workdays, which includes 5,637 $MTCO_2e$ from roadway construction and 4,003 $MTCO_2e$ from structures construction.

All construction contracts include Caltrans Standard Specifications related to air quality. Section 7-1.02A and 7-1.02C, Emissions Reduction, requires 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. Section 14-9.02, Air Pollution Control, 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. These requirements are further discussed in Section 2.2.6, *Air Quality*.

3.4.3.3 CEQA Conclusion

Short-term construction and long-term operational GHG impacts were calculated using the Cal-CET and CT-EMFAC2021 emissions model (version 1.0.2.0). Operational emissions were computed for the existing conditions in 2020 and the No-Build and Build Alternatives for the Opening Year and Design Year. All of the Build Alternatives would have lower overall GHG emissions when compared to existing conditions. Therefore, the Project would have a less than significant impact on climate change under CEQA.

Project-specific mitigation measures are not required to reduce operational GHG emissions. However, Caltrans is committed to implementing measures to help reduce GHG emissions, which are outlined in the following section and are further discussed in Section 2.2.6, *Air Quality* and Section 2.2.8, *Energy*. In addition, as discussed in Section 3.2.17, *Transportation*, the Project would implement mitigation measures that would reduce the Project's VMT, which includes expanding the I-680 express bus service (**TRAN-MM-1**), constructing three new shared-mobility hubs along the corridor (**TRAN-MM-2**), and augmenting Contra Costa County's TDM Program (**TRAN-MM-3**).

3.4.4 Greenhouse Gas Reduction Strategies

3.4.4.1 Statewide Efforts

In response to AB 32, the Global Warming Solutions Act, California is implementing measures to achieve emission reductions of GHGs that cause climate change. Climate change programs in California are effectively reducing GHG emissions from all sectors of the economy. These programs include regulations, market programs, and incentives that will transform transportation, industry, fuels, and other sectors, to take California into a sustainable, cleaner, low-carbon future, while maintaining a robust economy (California Air Resources Board, 2022b).

Major sectors of the California economy, including transportation, will need to reduce emissions to meet 2030 and 2050 GHG emissions targets. The Governor's Office of Planning and Research identified five sustainability pillars in a 2015 report: (1) Increasing the share of renewable energy in the State's energy mix to at least 50 percent by 2030; (2) Reducing petroleum use by up to 50 percent by 2030; (3) increasing the energy efficiency of existing buildings by 50 percent by 2030; (4) Reducing emissions of short-lived climate pollutants; and (5) Stewarding natural resources, including forests, working lands, and wetlands, to ensure that they store

carbon, are resilient, and enhance other environmental benefits (California Governor's Office of Planning and Research, 2015).

The transportation sector is integral to the people and economy of California. To achieve GHG emission reduction goals, it is vital that the state build on past successes in reducing criteria and toxic air pollutants from transportation and goods movement. GHG emission reductions will come from cleaner vehicle technologies, lower-carbon fuels, and reduction of vehicle miles traveled (VMT). Reducing today's petroleum use in cars and trucks is a key state goal for reducing GHG emissions by 2030 (California Environmental Protection Agency, 2015).

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.

Subsequently, Governor Gavin Newsom issued EO N-82-20 to combat the crises in climate change and biodiversity. It instructs state agencies to use existing authorities and resources to identify and implement near- and long-term actions to accelerate natural removal of carbon and build climate resilience in our forests, wetlands, urban greenspaces, agricultural soils, and land conservation activities in ways that serve all communities and in particular low-income, disadvantaged, and vulnerable communities. To support this order, the California Natural Resources Agency released *Natural and Working Lands Climate Smart Strategy* (California Natural Resources Agency, 2022).

3.4.4.2 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 an 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.

Climate Action Plan for Transportation Infrastructure

The *California Action Plan for Transportation Infrastructure* (CAPTI) builds on executive orders signed by Governor Newsom in 2019 and 2020 targeted at reducing GHG emissions in transportation, which account for more than 40 percent of all polluting emissions, to reach the state's climate goals. Under CAPTI, where feasible and within existing funding program structures, the state will invest discretionary transportation funds in sustainable infrastructure projects that align with its climate, health, and social equity goals (California State Transportation Agency, 2021).

California Transportation Plan

The California Transportation Plan (CTP) is a statewide, long-range transportation plan to meet our future mobility needs and reduce GHG emissions. It serves as an umbrella

document for all the other statewide transportation planning documents. The CTP 2050 presents a vision of a safe, resilient, and universally accessible transportation system that supports vibrant communities, advances racial and economic justice, and improves public and environmental health. The plan's climate goal is to achieve statewide GHG emissions reduction targets and increase resilience to climate change. It demonstrates how GHG emissions from the transportation sector can be reduced through advancements in clean fuel technologies; continued shifts toward active travel, transit, and shared mobility; more efficient land use and development practices; and continued shifts to telework (California Department of Transportation, 2021a).

Caltrans Strategic Plan

The *Caltrans 2020–2024 Strategic Plan* includes goals of stewardship, climate action, and equity. Climate action strategies include developing and implementing a Caltrans Climate Action Plan; a robust program of climate action education, training, and outreach; partnership and collaboration; a VMT monitoring and reduction program; and engaging with the most vulnerable communities in developing and implementing Caltrans climate action activities (California Department of Transportation, 2021b).

Caltrans Policy Directives and Other Initiatives

Caltrans Director's Policy 30 (DP-30) Climate Change (June 22, 2012) established a policy to ensure coordinated efforts to incorporate climate change into Caltrans decisions and activities. Other Director's policies promote energy efficiency, conservation, and climate change, and commit Caltrans to sustainability practices in all planning, maintenance, and operations. *Caltrans Greenhouse Gas Emissions and Mitigation Report* (California Department of Transportation, 2020) provides a comprehensive overview of Caltrans' emissions and current Caltrans procedures and activities that track and reduce GHG emissions. It identifies additional opportunities for further reducing GHG emissions from Department-controlled emission sources, in support of Caltrans and State goals.

Project-Level GHG Reduction Strategies

In accordance with the memo *Significance and Mitigation under the California Environmental Quality Act* (November 2016), Caltrans is required to identify and list all feasible measures to reduce GHG emissions from operations and construction. The following measures would be implemented relevant to GHG emissions, which are described further in Section 2.2.6, *Air Quality,* Section 2.2.8, *Energy*, and Section 3.2.17, *Transportation*:

- **AQ-1**: Equipment Maintenance
- **AQ-3**: Compliance with Air Quality Regulations and Ordinances,
- **AQ-5**: Construction Best Practices for Exhaust
- **E-1**: Greenhouse Gas Reduction Efforts

- **E-2**: Construction Equipment Operation
- **TRAN-MM-1**: I-680 Express Bus Service
- **TRAN-MM-2**: Shared Mobility Hubs
- **TRAN MM-3**: TDM Program

3.4.5 Adaptation

Reducing GHG emissions is only one part of an approach to address 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, and storm surges combined with a rising sea level can inundate highways. Wildfire can directly burn facilities directly and indirectly cause damage when rain falls on denuded slopes that landslide after a fire. Effects would vary by location and may, in the most extreme cases, require that a facility be relocated or redesigned. Furthermore, the combined effects of transportation projects and climate change stressors can exacerbate the impacts of both on vulnerable communities in a project area. Accordingly, Caltrans must consider these types of climate stressors in how highways are planned, designed, built, operated, and maintained.

3.4.5.1 Federal Efforts

Under NEPA assignment, Caltrans is obligated to comply with all applicable federal environmental laws and FHWA NEPA regulations, policies, and guidance.

The *Fifth National Climate Assessment,* published in 2003, presents the most recent science and "analyzes the effects of global change on the natural environment, agriculture, energy production and use, land and water resources, transportation, human health and welfare, human social systems, and biological diversity; [It analyzes current trends in global climate change, both human-induced and natural, and projects major trends for the subsequent 25 to 100 years… to support informed decision-making across the United States." Building on previous assessments, it continued to advance "an inclusive, diverse, and sustained process for assessing and communicating scientific knowledge on the impacts, risks, and vulnerabilities associated with a changing global climate" (U.S. Global Change Reseearch Program, 2023).

The U.S. Department of Transportation recognizes the transportation sector's major contribution of GHGs that cause climate change and has made climate action one of the department's top priorities (U.S. Department of Transportation, 2023). FHWA's policy is 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 planning that fosters resilience to climate effects and sustainability at the federal, state, and local levels (Federal Highway Administration, 2022).

The National Oceanic and Atmospheric Administration provides sea level rise projections for all U.S. coastal waters to help communities and decision makers assess their risk from sea level rise. Updated projections through 2150 were released in 2022 in a report and online tool (NOAA, 2022).

3.4.5.2 State Efforts

Climate change adaptation for transportation infrastructure involves long-term planning and risk management to address vulnerabilities in the transportation system. A number of state policies and tools have been developed to guide adaptation efforts.

California's Fourth Climate Change Assessment (Fourth Assessment) (2018) provides information to help decision makers across sectors and at state, regional, and local scales protect and build the resilience of the state's people, infrastructure, natural systems, working lands, and waters. The Fourth Assessment reported that if no measures are taken to reduce GHG emissions by 2021 or sooner, the state is projected to experience an up to 8.8 degrees Fahrenheit increase in average annual maximum daily temperatures; a two-thirds decline in water supply from snowpack and water shortages; a 77 percent increase in average area burned by wildfire; and large-scale erosion of up to 67 percent of Southern California beaches due to sea level rise. These effects will have profound impacts on infrastructure, agriculture, energy demand, natural systems, communities, and public health (State of California, 2018).

Sea level rise is a particular concern for transportation infrastructure in the coastal zone. Major urban airports will be at risk of flooding from sea level rise combined with storm surge as early as 2040; San Francisco airport is already at risk. Miles of coastal highways vulnerable to flooding in a 100-year storm event will triple to 370 by 2100, and 3,750 miles will be exposed to temporary flooding. The Fourth Assessment's findings highlight the need for proactive action to address these current and future impacts of climate change.

To help actors throughout the state address the findings of California's Fourth Climate Change Assessment, AB 2800's multidisciplinary Climate-Safe Infrastructure Working Group published *Paying it Forward: The Path Toward Climate-Safe Infrastructure in California.* This report provides guidance on assessing risk in the face of inherent uncertainties still posed by the best available climate change science. It also examines how state agencies can use infrastructure planning, design, and implementation processes to respond to the observed and anticipated climate change impacts (Climate-Safe Infrastructure Working Group 2018).

EO S-13-08, issued in 2008, directed state agencies to consider sea level rise scenarios for 2050 and 2100 during planning to assess project vulnerabilities, reduce risks, and increase resilience to sea level rise. It gave rise to the 2009 *California Climate Adaptation Strategy*, the Safeguarding California Plan, and a series of technical reports

on statewide sea level rise projections and risks, including the *State of California Sea-Level Rise Guidance Update* in 2018. The reports addressed the full range of climate change impacts and recommended adaptation strategies. The current *California Climate Adaptation Strategy* incorporates key elements of the latest sector-specific plans such as the *Natural and Working Lands Climate Smart Strategy*, *Wildfire and Forest Resilience Action Plan*, *Water Resilience Portfolio*, and the CAPTI (described above). Priorities in the 2023 *California Climate Adaptation Strategy* include acting in partnership with California Native American Tribes, strengthening protections for climate-vulnerable communities that lack capacity and resources, implementing nature-based climate solutions, using best available climate science, and partnering and collaboration to best leverage resources (California Natural Resources Agency, 2023).

EO B-30-15 recognizes that effects of climate change threaten California's infrastructure and requires state agencies to factor climate change into all planning and investment decisions. Under this EO, the Office of Planning and Research published *Planning and Investing for a Resilient California: A Guidebook for State Agencies*, to encourage a uniform and systematic approach to building resilience.

SB 1 Coastal Resources: Sea Level Rise (Atkins 2021) established statewide goals to "anticipate, assess, plan for, and, to the extent feasible, avoid, minimize, and mitigate the adverse environmental and economic effects of sea level rise within the coastal zone". As the legislation directed, the Ocean Protection Council collaborated with 17 state planning and coastal management agencies to develop the *State Agency Sea-Level Rise Action Plan for California* in February 2022. This plan promotes coordinated actions by state agencies to enhance California's resilience to the impacts of sea level rise (California Ocean Protection Council, 2022)

3.4.5.3 Caltrans Adaptation Efforts

Caltrans Vulnerability Assessments

Caltrans completed climate change vulnerability assessments to identify segments of the State Highway System vulnerable to climate change effects of precipitation, temperature, wildfire, storm surge, and sea level rise.

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 guide analysis of at-risk assets and development of Adaptation Priority Reports as a method to make capital programming decisions to address identified risks.

Caltrans Sustainability Programs

The Director's Office of Equity, Sustainability, and Tribal Affairs supports implementation of sustainable practices at Caltrans. The Sustainability Roadmap is a periodic progress report and plan for meeting the Governor's sustainability goals related to EOs B-16-12, B-18-12, and B-30-15. The Roadmap includes designing new buildings

for climate change resilience and zero-net energy and replacing fleet vehicles with zero-emission vehicles (California Department of Transportation 2023).

Project Adaptation Analysis

The adaptation analysis is intended to demonstrate how the project would be adapted or resilient to climate change effects. EO B-30-15 requires that all projects consider future climate conditions in planning and design decisions.

As climate change continues, melting ice and other factors are causing sea levels worldwide to rise. In California, scientists, engineers, and legislative agencies have put together several guidance documents to inform policy and design of projects impacted by sea-level rise. The following subsections describe guidance documents relevant to the Project area that have been published by the State of California, Caltrans, or Regional Water Quality Control Board (RWQCB). The San Francisco Bay Conservation and Development Commission's (BCDC) policy guidance was also reviewed for possible analysis; however, the Project Study Limits are outside BCDC's jurisdictional area. Climate change risk analysis involves uncertainties as to the timing and intensity of potential risks, although the analysis below uses the best available science. The proposed Project is also outside the coastal zone and not in an area subject to sea level rise. Accordingly, direct impacts to transportation facilities due to projected sea level rise are not expected.

Sea Level Rise

The guiding document for the State of California, the *State of California Sea-Level Rise Guidance*, 2018 Update (California Natural Resources Agency and California Ocean Protection Council, 2018) provides scenario-based, sea level rise projections at local active tidal gauge locations. According to District 4's *Climate Change Vulnerability Assessment*, Contra Costa County will have 2.1 miles of state highway exposed to sea level rise in the 0.5 meter (1.64 feet) scenario from 2048–2100, 2.3 miles in the 1 meter (3.28 feet) scenario from 2064–2100, and 3.6 miles in the 1.75 meters case (5.74 ft) scenario from 2081–2100 (California Department of Transportation, 2018). Key sea level rise projection scenarios from this document for the nearest tidal gauge (San Francisco Bay) are shown in Table 3.4.5-1 and are included in the *Sea Level Rise Risk Assessment Memorandum* for the Project (WRECO, 2021). The medium-high scenario represents a 1-in-200 chance, or 0.5 percent probability, of occurring while the extreme risk scenario does not have a specific numerical probability associated with it but is based on the literature and research for regional factors along the U.S. coastline and Antarctic ice sheet instability.

Table 3.4.5-1. Sea Level Rise Projections for San Francisco (feet of sea level rise)

Year	Medium-High Risk Aversion (feet)	Extreme Risk Aversion (feet)
2030	0.8*	1.0

Year	Medium-High Risk Aversion (feet)	Extreme Risk Aversion (feet)
2050	1.9*	2.7
2070	3.1-3.5	5.2
2100	5.7-6.9	10.2

* Only the high emissions scenario is available for the years 2030 and 2050.

Although the Project does not have direct contact with the ocean, sea level rise can still pose a risk if not properly prepared for when looking out to the year 2050 and beyond. The main vulnerable area for the Project is south of the Waterford exit at PM 23.9, before the Benicia-Martinez Bridge toll plaza. The low elevation of the travel lanes at this location (approximately 11 feet NAVD 88) presents the potential risk of up to 1 foot of roadway inundation for the year 2050 during a 100-year extreme tide under extreme risk aversion sea level rise scenario. Under more common tide conditions, this risk would not present within the design life of the Project. Furthermore, all work areas have been moved to south of the preserve. There would be no work near the toll plaza, which would further reduce the risk of sea level rise. Generally, areas south of Pacheco Boulevard appear to be at minimal risk of direct inundation due to sea level rise; however, because all of the drainage in this area leads to Suisun Bay, flooding due to backwater is still an important consideration for future drainage design work.

California Department of Transportation

The most up-to-date document from Caltrans regarding sea level rise policy is *Guidance on Incorporating Sea Level Rise* (California Department of Transportation, 2011). Based upon the guidance on when to incorporate sea level rise into the project programming and design, the Project would lean toward incorporating sea level rise into the project design because of anticipated travel delays resulting from inundation, as well as I-680 being a critical route. For 2050, the average sea level rise estimate suggested was 1.2 feet, which would be considered a low estimate based on more recent studies discussed above.

In addition to this guidance document, Caltrans published a *Climate Change Vulnerability Assessment* for District 4 in January 2018 documenting potential climate change impacts to infrastructure in Sonoma, Napa, Marin, Solano, Contra Costa, Alameda, San Francisco, San Mateo, and Santa Clara Counties (California Department of Transportation, 2018). North of the Project Study Limits, the highway could experience flooding due to exposure to 1.64 feet of sea level rise and 100-year storm elevations as well as 3.28 feet of sea level rise (WRECO, 2021). As discussed in the previous section, these levels of sea level rise are predicted by the medium-high risk aversion scenario to occur by 2050 and 2070, respectively, and by the extreme risk aversion scenario by 2040 and 2060.

San Francisco Bay Regional Water Quality Board

The San Francisco Bay RWQCB helped develop the Adaptation Atlas (the Atlas)—a document by the San Francisco Estuary Institute that breaks down areas of the San Francisco Bay into 30 Operational Landscape Units (OLU) (San Francisco Estuary Institute and San Francisco Bay Area Planning and Urban Research Association, 2019). Within this framework, the Project area falls under OLU 12, Walnut, which stretches from the Benicia-Martinez Bridge in Concord to Pacheco Creek. Rather than discuss risks and policies, the Atlas defines each OLU by its geomorphic, hydrologic, and historical conditions and suggests appropriate widescale adaptation measures for each area. OLU 12 can be described as a wide alluvial valley with large areas of historic tidal marshes. The Atlas suggests polders, ecotone levees, and reconnection of Walnut Creek with its baylands as appropriate sea level rise mitigation measures. These measures may involve I-680 in the future but fall outside the scope of this analysis.

Precipitation and Flooding

With climate change, California is expected to experience increasing temperatures and changing precipitation events, due to an increase in energy and moisture in the atmosphere (California Department of Transportation, 2018). Increased precipitation levels, combined with other changes in land use and land cover, can increase the risk of damage or loss from flooding. The Caltrans Climate Change Vulnerability Assessment for District 4 mapped projected changes in 100-year storm precipitation under future climate change conditions. Mapping indicates that some portions of the Bay Area will likely experience a 15 percent increase in the precipitation depth coming from a 100-year storm by 2085.

According to the Sea Level Rise Risk Assessment Memorandum (WRECO, 2021) prepared for the Project, the Project passes through multiple flood zones, as designated by the Federal Emergency Management Agency (FEMA). From north to south, I-680 crosses the FEMA floodway Peyton Slough just south of the toll plaza. The nearest cross section lists the flooding at 11 feet of elevation. The portion of I-680 directly surrounding this crossing is in Zone AE, which represents areas subject to a 1 percent or greater annual chance of flooding in any given year. There is an area of Zone A, which represents the 100-year base flood, south of the Pacheco Boulevard freeway entrance at PM 22.7. Another Zone AE regulatory floodway crossing exists just south of the SR-4 Interchange at Grayson Creek. I-680 passes over the floodway between 18 and 19 feet of elevation. Areas directly surrounding this crossing are in Zone X, areas of 1 percent annual chance flood with annual depth less than 1 foot. I-680 also crosses the Las Trampas floodway in the City of Walnut Creek between 151 and 152 feet of elevation. Two other freeway undercrossings south of Las Trampas Creek are in Zone X, areas of 1 percent annual chance flood with annual depth less than 1 foot. The remaining areas are in Zone X, areas of minimal flood hazard.

According to the Water Quality Assessment Report (WRECO, 2022b) prepared for the Project, temporary water quality impacts can result from sediment discharge from disturbed soil areas and construction near water resources or drainage facilities that

discharge to water bodies. Temporary impacts would be addressed using temporary construction site BMPs, such as temporary sediment control, soil stabilization, tracking control, waste management and materials pollution control, job site management, and miscellaneous job site management. These measures would be identified in the temporary water pollution control plans developed during the design phase and comply with Section 13 of Caltrans' Standard Specifications.

According to the Drainage Impact Study prepared for the Project (WRECO, 2022a), all of the Build Alternatives would increase impervious surfaces, which would increase flows and impact existing drainage patterns to the local drainage systems. All Build Alternatives would include the installation of permanent BMPs to avoid the potential for Project-related stormwater discharges to substantially alter drainage patterns, violate water quality standards, or substantially degrade water quality. All Build Alternatives propose biofiltration swales, designed for bioretention, with either trash nets or gross solids removal devices to provide stormwater treatment and achieve trash capture. For bioretention swales, retention would be achieved through the use of an engineered soil mix and an underdrain system. The final location of permanent BMPs would be determined during the final design phase and in compliance with permit requirements from regulatory agencies. Given the proposed Project's water quality protection features that would minimize surface runoff impacts, Project facilities are not expected to be at risk from effects of future changes in storm precipitation and flooding.

Wildfire

Wildfire poses a risk to driver safety, system operations, and Caltrans infrastructure. According to the Caltrans Climate Change Vulnerability Assessment for District 4, the Project Study Limits are not within a very high, high, or moderate fire hazard severity zone (California Department of Transportation, 2018). There are no parts of the project classified as "exposed roadway" (California Department of Transportation, 2018). However, there are fire hazard severity zones in the surrounding hills, particularly within and adjacent to the Acalanes Ridge Open Space, Briones Regional Park, Mount Diablo State Park, and Las Trampas Regional Wilderness, as described in Section 2.1.7, *Utilities/Emergency Services*. Wildfire can contribute to potential landslides, flooding, and wildfire smoke. Construction contractors would be required to adhere to Caltrans Standard Specification for Fire Prevention. Wildfire is further discussed in Section 3.3, *Wildfire*.

Temperature

Temperature affects choice of pavement materials, design of foundations, and retaining walls in terms of ground moisture conditions and need for expansion/contraction of bridge joints. During operations and maintenance, higher temperatures may affect safety of employees working outdoors, survival of landscaping and vegetation in right-of-way, and pavement condition, which could require more frequent maintenance. The Caltrans Climate Change Vulnerability Assessment for District 4 analyzed the effect of temperature regarding pavement design. While the Bay Area and District 4 are generally cooler than the more inland districts, the Project Study Limits will still face

extreme heat events more frequently in the future, which would likely increase the frequency of maintenance activities, impact landscaping and vegetation choices, and would affect the safety conditions for employees working outdoors (California Department of Transportation, 2018). One way temperature impacts Caltrans is through the selection of pavement binder grade. The appropriate pavement binder grade is one that can withstand the mean of the annual lowest temperature expected over a pavement's design life and the mean of the highest mean seven consecutive day high temperatures expected during a pavement's design life (California Department of Transportation, 2018). The design life of asphalt pavement is typically 20–25 years or sooner if quality degrades more rapidly (California Department of Transportation, 2018). As the Project would be operational in 2027, the scenario years in the Vulnerability Assessment for 2025 and 2055 are appropriate for this analysis. Within the Project Study Limits, the greatest change in average minimum temperature is 2.0 to 3.9 degrees Fahrenheit in 2025 and 4.0 to 5.9 in 2055. The greatest change in average 7-day maximum temperature is 2.0 to 3.9 degrees Fahrenheit in 2025 and 6.0 to 7.9 in 2055 (California Department of Transportation, 2018). These temperature variations should be considered in pavement material and maintenance decisions.

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3.5 CUMULATIVE IMPACTS

This section on cumulative impacts has been copied from the main body of the document to the CEQA Cumulative Impacts section because CEQ regulations that were contained in 40 Code of Federal Regulations (CFR), which included cumulative impacts, have been removed; and the CEQA cumulative impact analysis cross-referenced this text in the Draft Environmental Document.

3.5.1 Regulatory Setting

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 on resources in the project area may result from residential, commercial, industrial, and highway development, as well as from agricultural development and the conversion to more intensive agricultural cultivation. These land use activities can degrade habitat and species diversity through consequences such as displacement and fragmentation of habitats and populations, alteration of hydrology, contamination, erosion, sedimentation, disruption of migration corridors, changes in water quality, and introduction or promotion of predators. They can also contribute to potential community impacts identified for the project, such as changes in community character, traffic patterns, housing availability, and employment.

The California Environmental Quality Act (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 the National Environmental Policy Act (NEPA) can be found in 40 CFR Section 1508.1.

3.5.2 Cumulative Impacts Analysis

3.5.2.1 Methodology

The cumulative impacts analysis determines whether the Build Alternatives, in combination with other past, present, or reasonably foreseeable projects, would result in a cumulative effect, and if so, whether the Build Alternatives' contribution to the cumulative impact would be considerable. Present and reasonably foreseeable future projects include land use developments, infrastructure, and other transportation improvements that are planned and funded and would be near the proposed Build Alternatives' improvements.

A proposed project would not contribute to a cumulative impact of a resource if that project does not result in any direct or indirect impact on a resource (California Department of Transportation, 2005). Council on Environmental Quality (CEQ) regulations require cumulative impact analyses to focus on actions "that are likely or probable, rather than those that are merely possible" (Federal Highway Administration, 2003).

A cumulative impacts analysis is required for resources with significant impacts under CEQA (see Chapter 3, *California Environmental Quality Act Evaluation*). In addition, a cumulative analysis is required for resources with a less than significant impact if the resource is in poor health, declining health, or at risk (California Department of Transportation, 2005).

The approach for analyzing cumulative impacts followed the California Department of Transportation's (Caltrans) 8-step process, as described in *Guidance for Preparers of Cumulative Impact Analysis Approach and Guidance*, which is as follows:

1. Identify resources to consider in the cumulative impacts analysis.
2. Define the Resource Study Area (RSA), or geographic boundary, for each cumulative impact analysis.
3. Describe the current health of each resource.
4. Identify any direct and/or indirect impacts the Build Alternative may contribute to a cumulative impact on the identified resources.
5. Identify a set of active projects to include in the cumulative impacts analysis.
6. Assess cumulative impacts.
7. Report the results of the cumulative impacts analysis.
8. Assess the need for additional avoidance, minimization, or mitigation measures to address any cumulative impacts (California Department of Transportation, 2005).

For Caltrans projects, each resource has a separate RSA rather than a single study area for all resources combined. The RSA boundaries for cumulative impacts analysis are also often broader than the boundaries used for analyzing a project's direct impacts.

The No-Build Alternative would maintain the current configurations of Interstate 680 (I-680). Under the No-Build Alternative, the proposed Project would not be constructed, and no cumulative environmental effects in combination with other projects would occur. Therefore, the No-Build Alternative is not discussed further in this section.

3.5.2.2 Cumulative Projects

The following tables list transportation corridor projects near the Project Study Limits, as well as projects specific to Caltrans District 4. They also include projects in cities near the Project Study Limits. These projects are in various stages of development.

Table 3.5.2-1. Proposed Planned Projects (CEQANet)

Project Name	Project Description	County	Sponsor
Oakland Alameda Access Project	Alameda County Transportation Commission (CTC) and Caltrans propose roadway improvements to increase mobility for travelers between Interstate 880 (I-880), the Posey and Webster Tubes, and the cities of Oakland and Alameda. Freeway-bound congestion would be reduced on local roadways. Existing interstate ramps would be reconstructed, local streets in downtown Oakland would be reconfigured, and bicycle and pedestrian connectivity would be improved within and between both cities.	Alameda	Caltrans District 4
Oak Park Properties Specific Plan	The Oak Park Properties Specific Plan contemplates two development projects (the Civic Project and the Residential Project) within the Specific Plan area (plan area) boundaries. The Civic Project includes construction of library facilities, a park, vehicular parking, roadway improvements, the creation of a new floodplain system with water detention basins, upgrading three existing outfalls to Grayson Creek, and the creation of a new pedestrian trail immediately west of the Grayson Creek Corridor. The Residential Project includes demolition of the vacant administrative offices; the County library building; and the paved parking lot, trees, and landscaping for development of 34 single family dwelling units, 7 accessory dwelling units, and a new pocket park.	Contra Costa	City of Pleasant Hill

Table 3.5.2-2. Proposed Planned Projects (Caltrans District 4 Specific Projects)

Project Name	Project Description	County	Sponsor
SR-4 Capital Preventative Maintenance Project	Caltrans proposes to resurface existing pavement, upgrade metal beam guard rails, improve drainage, and replace/upgrade curb ramps to meet Americans with Disabilities Act (ADA) standards. The purpose is to preserve and extend the service life of pavement structures, improve motorist safety, and meet ADA standards. This project is needed because the existing roadway exhibits pavement distress and will lead to further deterioration that will require major rehabilitation if left uncorrected. The existing guard rails and curb ramps do not meet current design standards.	Contra Costa	Caltrans District 4
I-680 Roadway Repair	Roadway repairs will occur at six locations along I-680 from PM 22.19 to PM 24.25.	Contra Costa	Caltrans District 4
RESTORE PAVEMENT – 4W900-0422000209	Restore uneven pavement, cold planning, and hot mix asphalt (HMA) repaving at PM 8.6 on Route 680 in the town of Danville, Contra Costa County.	Contra Costa	Caltrans District 4
Bridge Preservation Project – 3W750/0422000032	Work will include placing polyester concrete deck overlay, treating bridge deck with methacrylate, applying polyurethane under slabs to remove offset, repairing spalls, repairing asphalt concrete (AC) approaches, replacing joint seals, and upgrading drainage systems.	Contra Costa	Caltrans District 4
Bridge Preservation Project – 3W530/042100038	Work will include overlaying polyester on bridge decks and removing and replacing rail work at six bridges (Bridge Nos. 28-0221, 28-0222, 28-0199, 28-0200, 28-0166, and 28-0162). All removed delineation will be replaced.	Contra Costa	Caltrans District 4
Bridge Preservation 3Q520/0419000220	Cleaning and placing methacrylate on the deck of bridge 28-0274 on I-580. Paint bridge ID at both approaches/abutments. Methacrylate will also be placed on the deck of Bridge 28-0128R on I-680.	Contra Costa	Caltrans District 4
PAVEMENT SETTLEMENT 3W480/0421000373	Repair pavement settlement at Bollinger Canyon Road overpass toward southbound I-680, PM 2.89 in San Ramon, Contra Costa County.	Contra Costa	Caltrans District 4

Project Name	Project Description	County	Sponsor
Interstate 680 Roadway Rehabilitation Project	Caltrans proposes to rehabilitate the mainline roadway and ramp pavement on I-680 from the Koopman Road Undercrossing in the town of Sunol to the Alcosta Boulevard Overcrossing in the city of Dublin. The project also proposes to repair or replace drainage systems, replace or upgrade guardrails, replace and upgrade the concrete median barrier in Segments 4–6, replace all signs, and implement ADA curb ramp requirements. The roadway will be rehabilitated within the same alignment, and all work will be done within the State right-of-way. There will be no increase in lane capacity, and no temporary or permanent acquisition of new right-of-way.	Contra Costa	Caltrans District 4
I-680 Ramp Metering (04-1Q720K)	Caltrans State Highway Operation and Protection Program (SHOPP) project to install ramp metering along I-680 from I-580 through Contra Costa County. The project is currently in the Plans, Specifications, and Estimates (PS&E) phase with completion planned for the end of 2024. Construction completion is anticipated in 2028.	Contra Costa	Caltrans District 4
Northbound SR-242 Rehabilitation Project Concord (04-26980)	Caltrans Bay Area will replace 3,500 linear feet of concrete paving in both lanes #2 and #3 of northbound State Route (SR) 242 in Concord.	Contra Costa County	Caltrans District 4

Table 3.5.2-3. Plan Bay Area 2050 Proposed Projects

Project Name	Project ID (RTP ID)	County	Sponsor
Corridor and Interchange Improvements SR-4 Contra Costa County	21-T06-031	Contra Costa	CCTA
Corridor and Interchange Improvements SR-24 Contra Costa County	21-T06-033	Contra Costa	CCTA

Source: (Association of Bay Area Governments and Metropolitan Transportation Commission, 2013)
Notes: CCTA = Contra Costa Transportation Authority; RTP = Regional Transportation Plan

Table 3.5.2-4. Other Proposed Projects

Project Name	Project Description	County	Sponsor
West County High-Capacity Transit Study: Express Bus Implementation Phase 1	The Transit Study evaluated public transportation options and identified funding opportunities to expand high-capacity transit service and access for residents in West County. It also examined how to encourage transit use and improve service in underserved communities. Freeway-flyer express service on I-80 operating from the Hercules Transit Center south to Berkeley, Emeryville, and Oakland.	Contra Costa	WCCTAC
15-Minute BART Feeder Network	Make County Connection services a viable alternative to driving a car. The system needs to consider increasing frequency during the peak commute periods.	Contra Costa	CCCTA
Downtown Concord Circulator	Implementation of a downtown circulator/trolley service that is similar to the Downtown Walnut Creek Trolley.	Contra Costa	CCCTA
I-680 Corridor Service Improvements	Enhanced transit service within the I-680 corridor, which includes new park and ride facilities constructed near I-680, more direct and local bus services between park and ride facilities and BART stations, the addition of auxiliary lanes on I-680 to allow buses to operate along the shoulders and bypass peak period congestion, and increased school bus service.	Contra Costa	CCCTA
Express Bus/Bus Rapid Transit (BRT) – Phase 2	Deployment of Livermore Amador Valley Transit Authority's (LAVTA) Route 10 Rapid Bus Program; phase 2 includes upgrades to and expansion of the initial Rapid Project.	Alameda	City of Dublin
I-680 Express Bus Service	Provide connections to other transit services; potential for electric buses or hydrogen fuel cell buses to be implemented in the future.	Alameda and Contra Costa	CCTA and LAVTA

Project Name	Project Description	County	Sponsor
Lamorinda Bicycle and Pedestrian Connectivity Program	Sidewalk gap closures, bicycle connection to transit locations.	Contra Costa	SWAT
Martinez Intermodal Station – Crockett Bay Trail Gap Closure Project	This project will construct a Class 1, shared-used path from Berrellesa Street along the railroad track to the Nejedly Staging Area at Carquinez Strait Regional Shoreline.	Contra Costa	East Bay Regional Park District
Iron Horse/BART Connector South	Trail to transit connection.	Contra Costa	Walnut Creek
Iron Horse Trail to Walnut Creek BART North	Trail to transit connection.	Contra Costa	Walnut Creek
Open Road Tolling Conversion Northern Bridges (04-2W520)	Convert the Antioch Bridge, Benicia-Martinez Bridge, and Carquinez Bridge toll plazas to open road tolling. The project is currently in PA/ED phase. Construction is anticipated to begin in 2026.	Contra Costa	BATA
Coordinated Adaptive Ramp Metering (CARM) Project (04-0Q960)	CARM project will implement an adaptive ramp metering system on northbound I-680 between Alcosta Boulevard and Olympic Boulevard initially, and a future phase will expand that to both directions of I-680 in Contra Costa County. The project is currently in the PS&E phase. Construction is anticipated to begin in 2026.	Contra Costa	CCTA
I-680/SR-4 Interchange Improvement Project (04-22914)	The I-680/SR-4 Interchange Improvement Project will widen approximately 4 miles of SR-4 in both directions between Morello Avenue in Martinez and SR-242 by adding an additional lane in the eastbound and westbound directions to improve on-ramp and off-ramp merging. Construction for Phases 1, 2a, and 4 is anticipated to begin in 2025. Phase 3 was completed in 2021.	Contra Costa	CCTA

Project Name	Project Description	County	Sponsor
I-680 Express Lanes Project, Sunol to Alcosta Boulevard in San Ramon (04-0Q3000)	The I-680 Express Lanes from SR-84 to Alcosta Boulevard Project will close the gap between existing and in-progress high-occupancy vehicle (HOV)/express lane projects directly to the north and south. The project extends for approximately 9 miles on northbound and southbound I-680 through Sunol, Pleasanton, Dublin, and San Ramon. Phase 1 started construction in 2023. Phase 2 would focus on northbound.	Alameda and Contra Costa County	Alameda CTC
Alameda I-680 Roadway Rehabilitation Project (04-0J620)	Caltrans and the Alameda CTC will begin construction on several projects on I-680 in Alameda County in the cities of Fremont and Pleasanton and the town of Sunol	Alameda	Alameda CTC
Bayview Residential Project	This project proposes 144 single-family homes and associated internal roadways on an approximately 78-acre project site in the Vine Hill/Pacheco Boulevard area	Contra Costa	Developer
Oak Road Townhouse Condominiums	This 5.94-acre project site consists of eight parcels and is located at 2740 Jones Road.	Contra Costa	Developer
Tassajara Parks Housing Development	This project would consist of the construction of 125 single-family homes with substantial park, recreation, and open space components in the Tassajara Valley area of unincorporated Contra Costa County	Contra Costa	Developer

BART = Bay Area Rapid Transit; BATA = Bay Area Toll Authority; Alameda CTC = Alameda County Transportation Commission; CCCTA = Central Contra Costa Transit Authority; CCTA = Contra Costa Transportation Authority; LAVTA = Livermore Amador Valley Transit Authority; PA/ED = Project Approval and Environmental Document; PS&E = Plans, Specifications and Estimate; WCCTAC = West Contra Costa Transportation Advisory Committee; SWAT = Southwest Area Transportation Committee

3.5.2.3 Resource Topics with No Contribution to Cumulative Impacts

The resources considered in the cumulative impacts analysis follow Caltrans' 8-step process for identifying and assessing cumulative impacts (California Department of Transportation, 2005). For resource areas that would have no adverse impacts from the proposed Project, incremental impacts would not be cumulatively considerable. Therefore, cumulative impacts are not anticipated for the following topic areas:

- Existing and Future Land Use (Section 2.1.1)
- Consistency with State, Regional, and Local Plans and Programs (Section 2.1.2)
- Parks and Recreational Facilities (Section 2.1.3)
- Growth (Section 2.1.4)
- Community Character and Cohesion (Section 2.1.5)
- Environmental Justice (Section 2.1.6)
- Utilities/Emergency Services (Section 2.1.7)
- Cultural Resources (Section 2.1.10)
- Hydrology and Floodplain (Section 2.2.1)
- Water Quality and Stormwater Runoff (Section 2.2.2)
- Geology/Soils/Seismic/Topography (Section 2.2.3)
- Paleontology (Section 2.2.4)
- Hazardous Waste/Materials (Section 2.2.5)
- Noise and Vibration (Section 2.2.7)
- Energy (Section 2.2.8)

3.5.2.4 Resources Considered for Cumulative Impact Analysis

Visual/Aesthetics

The I-680 corridor is an officially designated state scenic highway between SR-24 in the city of Walnut Creek and Mission Boulevard in the city of Fremont. Additionally, there are sections of the I-680 corridor that are classified as landscaped freeway for Contra Costa County. The project area is also surrounded by numerous mountain features, which include Mount Diablo. Multiple signs currently overlap views of scenic resources

along I-680, including Mount Diablo and foothills. In addition, I-680 was, and continues to be in many sections, a tree-lined highway. The mature trees, originally planted in response to citizen demands for highway screening, are being removed as the highway continues to be widened. With the addition of travel lanes, the remaining space between the shoulder edge and right-of-way line is often too narrow to accommodate replacement tree planting.

Several of the projects listed in Section 3.5.2.2, *Cumulative Projects*, are anticipated to introduce additional pavement, lighting, signage, traffic signals, ramp metering systems, soundwalls, retaining walls, bridge widening, and interchange ramps, as well as remove trees and vegetation along I-680 (Haygood & Associates, 2022). This includes:

- Alameda I-680 Roadway Rehabilitation Project (04-0J620)
- Contra Costa Transportation Authority (CCTA) Coordinated Adaptive Ramp Metering Project (04-0Q960)
- Civil Infrastructure for Open Road Tolling (ORT) Conversion (04-2W520)
- I-680 Express Lanes Project, Sunol to Alcosta Boulevard in San Ramon (04-0Q3000; 4 miles south of the Project)
- I-680 Ramp Metering (04-1Q720K)
- Northbound SR-242 Rehabilitation Project Concord (04-26980)
- I-680/SR-4 Interchange Improvement Project (04-22914)

None of the Build Alternatives would directly impact the scenic resources mentioned above. However, all Build Alternatives would introduce new visual elements on I-680, including high-occupancy vehicle (HOV)/express lane signs, trestle gantries, and lights; additional pavement along the median and outside edges for the new HOV/express lanes; new retaining walls and (potentially) sound walls; bridge widening at the Rudgear Road Undercrossing (Alternatives 1C, 2, and 3); reconstruction of the Olympic Boulevard off-ramp (Alternatives 1C and 3); new Eastbound SR-24 Connector Undercrossing (Alternatives 1C and 3); new Mount Diablo Boulevard Undercrossing (Alternatives 1C and 3); new Lawrence Way Northbound On-ramp Undercrossing (Alternatives 2, 3, and 5); widening of the Contra Costa Canal Undercrossing (Alternatives 2, 3, and 5); and column modification on the Ygnacio Valley Road off-ramp (Alternatives 1C and 3).

Caltrans and the Federal Highway Administration (FHWA) mandate that a qualitative/aesthetic approach should be taken to address visual quality loss in a project area. This approach fulfills the letter and the spirit of FHWA requirements because it addresses and minimizes the actual cumulative loss of visual quality due to a project. In addition, measures would be implemented that would further minimize or avoid adverse impacts on visual/aesthetic resources, as described in Section 2.1.9, Visual/Aesthetics,

Visual/Aesthetics. Therefore, the Project would not result in a cumulatively considerable adverse effect on visual/aesthetic resources, because it would blend in with elements already existing along the I-680 corridor and would be consistent with existing roadway features. Additionally, Project construction activities would be temporary, and the implementation of project measures would further reduce any adverse effect on the Project area's scenic views.

Air Quality

An analysis of the regional emissions resulting from the Build Alternatives was conducted using CT-EMFAC2017 (Version 1.0.2), regional traffic projections, and network speeds provided via the CCTA travel demand model to compute an emission "burden" (Illingworth & Rodkin, Inc., 2023). The analysis, presented in Section 2.2.6, *Air Quality*, includes the Project's cumulative and indirect travel demand impacts and shows that Build Alternatives 1C, 2, and 3 would have comparable vehicle miles traveled (VMT)—less than 0.1 percent difference—to the No-Build Alternative and lower emissions than the existing conditions. Build Alternative 5 would have almost the same VMT (i.e., less than 0.01 percent difference) and lower emissions than existing conditions.

The carbon monoxide (CO) qualitative assessment and mobile source air toxics (MSAT) quantitative assessment can be considered indirect effect analyses because they look at air quality impacts (attributable to the Project) that could occur at a time in the future. Those assessments indicate that the potential for indirect effects associated with the Project would not be considerable. They demonstrate that in the future: (1) air quality impacts from CO would not cause or contribute to violations of the CO National Ambient Air Quality Standards (NAAQS); and (2) MSAT emissions from Build Alternatives 1C, 2, and 3 would be similar (i.e., less than 0.1 percent difference) to the No-Build Alternative and lower than existing conditions. Alternative 5 is similar to the No-Build Alternative also but would slightly increase MSAT emissions (by approximately 1 percent, on average).

Ozone (O_3) and secondary particulate matter are regional, cumulative issues because they are formed by photochemical and chemical reactions over time in the atmosphere, unlike primary sources of particulate matter that emit pollutants directly into the airshed. The Final EIR for *Plan Bay Area 2050* (Metropolitan Transportation Commission, 2021) and the *Bay Area 2017 Clean Air Plan* (Bay Area Air Quality Management District, 2017) address the regional and cumulative impacts from growth and transportation in the airshed, which include impacts from regional pollutants from existing transportation infrastructure. Alternative 2 was selected as the preferred alternative, and the final determination on project-level conformity is included in Appendix F, *Consultation and Coordination*.

The regional emissions analyses are based on a calibrated and validated regional travel demand model that estimated the cumulative and indirect impacts on the region. Likewise, this analysis used the CCTA travel demand model to estimate the cumulative and indirect impacts associated with the No-Build and Build Alternatives. In addition, project construction would be temporary, and the implementation of project measures

would further reduce any adverse effect on the Project area's air quality. Construction emissions are expected to be offset by emissions reductions during project operation. Therefore, the Project would not result in a cumulatively considerable adverse effect on air quality.

Greenhouse Gas Emissions

Under Executive Order (EO) 13990, CEQ issued *National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change* provided interim guidance to assist agencies in analyzing greenhouse gas (GHG) emissions and the climate change effects of their proposed actions under NEPA on January 9, 2023. EO 14154, *Unleashing American Energy*, revoked EO 13990 on January 20, 2025.

An analysis of project-generated GHG emissions is required under CEQA. This includes an additional analysis of GHG emissions as a cumulative impact due to the global nature of climate change (Pub. Resources Code, Section 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 project's incremental impacts 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 GHG must necessarily be found to contribute to a significant cumulative impact on the environment. For further discussion of the Project's GHG emissions, please see Section 3.2.8, *Greenhouse Gas Emissions*, and Section 3.4, *Climate Change*.

Biological Resources

Potential cumulative impacts associated with the proposed Project have been evaluated with other nearby, past, present, and proposed transportation and non-transportation projects in Contra Costa and Alameda Counties (HDR Engineering, Inc., 2023b). Projects and actions in the vicinity of the proposed Project may collectively produce impacts that require consideration as a whole.

There are several highway projects planned or completed in the I-680 corridor, which include:

- **I-680/SR-4 Interchange Improvement Project**. This project proposes to construct improvements at the I-680/SR-4 interchange. Informal consultation was completed with the U.S. Fish and Wildlife Service (USFWS) regarding potential impacts on the California red-legged frog (*Rana draytonii*). USFWS concurrence was received with the conclusion that the project would not likely adversely affect the frog (Caltrans 2008).

- **SR-4 Operational Improvements (I-680 to Bailey Road)**. The SR-4 Operational Improvements Project includes a continuation of an HOV lane on eastbound SR-4 from the Northbound I-680 on-ramp to the start of the existing HOV lane just east of SR-242, as well as the addition of several sections of mixed flow lanes on eastbound and westbound SR-4, between SR-242 and Bailey Road.

- **Iron Horse Trail Pedestrian Overcrossing Project**. The City of San Ramon, in cooperation with CCTA and Caltrans, constructed a pedestrian and cyclist overcrossing along the existing Iron Horse Trail alignment at Bollinger Canyon Road. The project will improve safety and air quality by reducing at-grade crossing conflicts between pedestrians, cyclists, and motorists and improve motor vehicle traffic by reducing idling at the intersection. The overcrossing consists of a cable-stayed main span with a central support and removed the left turn lane on the side of Bollinger Canyon Road where the trail crossing is located. The Iron Horse Trail Bicycle and Pedestrian Overcrossing at Bollinger Canyon Road officially opened to the public on Saturday, July 19, 2025.

Several land development projects are also planned in proximity to the Biological Study Area (BSA), including:

- **Bayview Residential Project**. This project proposes 144 single-family homes and associated internal roadways on an approximately 78-acre project site in the Vine Hill/Pacheco Boulevard area. The project also proposes four open space parcels, one of which is proposed as a park. The project site contains potential aquatic habitat for California red-legged frog. Measures are proposed to reduce potential impacts on California red-legged frog to a less-than-significant level.

- **Oak Road Townhouse Condominiums**. This 5.94-acre project site consists of eight parcels and is located at 2740 Jones Road, southeast of the I-680 and Treat Boulevard Intersection, within unincorporated Contra Costa County and adjacent to the city of Walnut Creek. This project will have no effect on California red-legged frog.

- **Tassajara Parks Housing Development**. This project would consist of the construction of 125 single-family homes with substantial park, recreation, and open space components in the Tassajara Valley area of unincorporated Contra Costa County. This project area is within designated critical habitat for California red-legged frog and Alameda whipsnake. There is no aquatic breeding habitat for California red-legged frog in the proposed project area, but there is potential upland migration/dispersal and over-summering habitat for California red-legged frog. The applicant will enter Section 7 consultation with USFWS and is proposing to mitigate for project-related impacts on this habitat at a 3:1 ratio.

All of the projects above went through, or are required to undergo, an environmental review to identify and account for or mitigate potential adverse effects. Those projects will preserve on-site upland habitat and restore affected on-site aquatic habitat. In the case of the Tassajara Parks Housing Development project, the applicant is proposing to mitigate off-site for project-related impacts on California red-legged frog habitat at a 3:1 ratio. Minimization and mitigation measures required for those projects and measures required for the proposed Project would ensure no cumulative impacts occur on biological resources. Therefore, the Project would not result in a cumulatively considerable adverse effect on biological resources.

Transportation

As described in Section 2.1.8, *Traffic and Transportation/Pedestrian and Bicycle Facilities*, all Build Alternatives would result in operational improvements on northbound I-680. The travel demand models used to analyze the Project's effectiveness estimated the cumulative and indirect impacts on the corridor. Implementation of the proposed Project, together with the other transportation projects associated with INNOVATE 680, would accommodate future traffic demand during peak periods, resulting in the reduction of traffic congestion conditions at various segments and interchanges. Transportation projects associated with INNOVATE 680 include part-time transit lanes, mobility as a service, automated driving systems, and advanced technologies and would provide alternative transportation modes, thereby resulting in additional beneficial congestion impacts. For all Build Alternatives, the impacts on circulation and access systems are beneficial on a cumulative basis under NEPA. (HDR Engineering, Inc., 2023a)

However, for transportation impacts under CEQA, Caltrans' guidance defines a cumulative impact as a "project's potential, when combined with other projects in an area or region, to significantly increase VMT" (California Department of Transportation, 2025). As described in Section 3.2.17, *Transportation*, Alternatives 1C, 2, and 3 would result in a significant cumulative impact on transportation, because when combined with other past, current, and probable future projects in the region, each of these alternatives would increase VMT within the metropolitan statistical area. Alternative 5 would not induce capacity and was screened from VMT analysis and mitigation. Although mitigation measures are proposed to reduce VMT under Alternatives 1C, 2, and 3, Caltrans has determined that the impact would remain significant and unavoidable. Therefore, Alternatives 1C, 2, and 3 would result in a cumulatively considerable impact on transportation under CEQA. These impacts are discussed further in Section 3.2.17, *Transportation*.

Chapter 4 Comments and Coordination

Early and continuing coordination with the general public and public agencies is an essential part of the environmental process. It helps planners 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 and tribal consultation and public participation for this Project have been accomplished through a variety of formal and informal methods, including interagency coordination meetings, public meetings, public notices, and Project Development Team (PDT) meetings. This chapter summarizes the results of the California Department of Transportation's (Caltrans or Department) efforts to fully identify, address, and resolve project-related issues through early and continuing coordination.

The PDT was formed at the initiation of the Project. The PDT includes representatives from Caltrans, Contra Costa Transportation Authority (CCTA; Project Sponsor), Metropolitan Transportation Commission (MTC), and consultants. Throughout the development of the Project, the Project Team met with numerous stakeholders, including United States (U.S.) Environmental Protection Agency (EPA), Bay Area Rapid Transit (BART), California Highway Patrol (CHP), and local agencies along the corridor.

4.1 PUBLIC SCOPING PROCESS

The Project scoping period for the Project began on June 15 and extended 45 days through July 29, 2020. The Project's scoping process was initiated with the preparation and distribution of a Notice of Preparation (NOP). The NOP is available in Appendix E, *Scoping Summary Report*. The NOP was posted at the State Clearinghouse (SCH #2020060297) on June 15, 2020. Public Notice was circulated electronically to public agencies and other key stakeholders on June 17, 2020, in compliance with Section 15082 of the California Environmental Quality Act (CEQA) Guidelines.

A dynamic public awareness and education program was implemented leading up to and throughout the 45-day scoping period in an effort to engage the diverse interested and affected members of the public regarding the Project and the public scoping meeting. At the time, large gatherings were not permitted in Contra Costa County due to the COVID-19 pandemic. Caltrans, in partnership with CCTA and MTC, determined that given the circumstances, a virtual public scoping meeting would meet the requirements of the scoping meeting. For the public's convenience, and to allow participation in a safe environment while social distancing, a virtual public meeting (open-house) was available throughout the public scoping period from June 15 through July 29, 2020, at innovate680.com in addition to the INNOVATE 680 Program website at ccta.net/projects/innovate-680. The virtual public meeting provided a Project overview and allowed attendees to navigate through important project information easily. Both websites were Americans with Disabilities Act compliant and could be viewed in attendees' desired language through use of Google Translate.

Public notices for the scoping comment period were published in the *East Bay Times* on June 12 and June 30, 2020. Copies of the public notice advertisements are included in Appendix E, *Scoping Summary Report*. A postcard mailer announcing the virtual public open house was mailed on June 12, 2020, to 7,067 homeowners within 1,000 feet of the I-680 corridor from Marina Vista Road/Waterfront Road in Martinez (northern boundary) to Stone Valley Road in Alamo (southern boundary). Invitations were also mailed to elected officials who represent the project area. Copies of the postcard mailer and database methodology are included in Appendix E, *Scoping Summary Report*.

Throughout the scoping period, Caltrans, CCTA, and partner agencies posted information on their respective social media platforms, including Facebook, Twitter, and LinkedIn.

On July 8, 2020, at 6:00 p.m., a stakeholder presentation was given via Zoom meeting to CCTA's INNOVATE 680 Policy Advisory Committee (PAC). CCTA and its consultants provided an update on public engagement/outreach activities occurring on the INNOVATE 680 Program, as well as some individual projects, including the Project.

On July 10, 2020, Contra Costa County Supervisor, Candace Andersen, included information about the Project in her weekly e-newsletter to her constituents.

A total of 15 written comments were received during the scoping period, which included 11 comments from the public (email or comment form). Four comments were received from agencies (one via email and three via SCH), which included the City of Walnut Creek, California Department of Fish and Wildlife (CDFW), CHP, and the Native American Heritage Commission (NAHC). No comments were received via phone. Comments received during the public scoping period were reviewed and are provided in Appendix E, *Scoping Summary Report*.

Public comments included the following topics: support of or opposition to the Project; website for NOP; purpose and need for the Project; alternatives and project features; developing an express bus system and other mass transit systems; and suggestions for technical topic discussions, including addressing vehicle miles travelled, equity, greenhouse gas (GHG) emissions, air quality impacts, noise impacts, and installing soundwalls in the environmental document.

4.2 CONSULTATION AND COORDINATION WITH PUBLIC AGENCIES

4.2.1 Federal Highway Administration

Following public circulation of the Draft Environmental Impact Report/ Environmental Assessment (EIR/EA), the proposed Project's air quality studies were submitted to the Federal Highway Administration (FHWA) for a project-level conformity determination. The FHWA's concurrence is included in Appendix F, *Consultation and Coordination*.

4.2.2 Metropolitan Transportation Commission

CCTA initiated consultation with MTC's Air Quality Conformity Task Force by submitting Project Assessment Forms for fine particulate matter ($PM_{2.5}$) impacts. At the Task Force's consultation meeting on March 24, 2022, the Task Force found that neither Alternatives 1C, 2, nor 3 would be a project of air quality concern (POAQC). The Task Force found that Alternative 5 would not be a POAQC on February 24, 2023, and concurred that the Project would not be a POAQC on December 19, 2023.

Public comment was requested regarding the information in the Project Assessment Summary for $PM_{2.5}$ Interagency Consultation and the Task Force's determination (see Appendix F, Consultations and Coordination) during circulation of the Draft EIR/EA. Following the close of the public review and comment period for the Draft EIR/EA, all comments received on air quality conformity were included in an Air Quality Conformity Application, which was submitted to FHWA. FHWA makes the final determination on project-level conformity. The FHWA's concurrence is included in Appendix F, *Consultation and Coordination*.

4.2.3 United States Army Corps of Engineers

The proposed Project has been designed to minimize impacts to wetlands and other waters of the United States, but the various alternatives under consideration would affect these resources as described in this EIR/EA. A preliminary jurisdictional delineation was submitted to the U.S. Army Corps of Engineers (USACE) for concurrence on October 12, 2023, which was received, dated September 12, 2024, and is included in Appendix F, *Consultations and Coordination*. It is anticipated that the Project would qualify for Nationwide Permit 14, which would be verified during the final design phase.

4.2.4 United States Fish and Wildlife Service and National Marine Fisheries Service

Endangered species consultation with the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) is necessary when a project has the potential to affect a federally listed species (i.e., threatened or endangered) and/or destroy or adversely modify designated critical habitat. Through the NEPA Assignment

Memorandum of Agreement with FHWA, Caltrans is authorized to handle FHWA's responsibilities under NEPA and other federal environmental laws, such as the Federal Endangered Species Act (FESA). USFWS and NMFS species lists can be found in Appendix F, *Consultation and Coordination*.

Caltrans prepared a Biological Assessment for the Project and informally consulted with USFWS under Section 7 of the FESA. Caltrans determined that the Project "may affect, but is not likely to adversely affect," the California red-legged frog (*Rana draytonii*), Alameda whipsnake (*Masticophis lateralis euryxanthus*), and the northwestern pond turtle (*Actinemys marmorata*). USFWS provided a Letter of Concurrence for the California red-legged frog and Alameda whipsnake, which has been included in Appendix F, *Consultations and Coordination*. Reinitiation of consultation could be required should the northwestern pond turtle be listed as threatened or endangered under the FESA prior to construction or other project changes occur.

Caltrans has determined that the Project would have no effect on aquatic species and consultation with NMFS is not required.

4.2.5 California Department of Fish and Wildlife

CDFW responded to the NOP via SCH in a letter dated July 21, 2020. California Endangered Species Act (CESA) consultation protects species listed as threatened or endangered from take, unless authorized through an incidental take permit. Caltrans has determined that the Project would not result in a take of the Alameda whipsnake or any other currently listed species on the CESA.

4.2.6 Regional Water Quality Control Board

Project construction could affect waters of the State. Pursuant to Section 401 of the Clean Water Act, a Notice of Intent would be submitted to the Regional Water Quality Control Board (RWQCB) during the final design phase. The proposed Project would implement any general Waste Discharge Requirements issued by RWQCB.

4.2.7 State Historic Preservation Officer

The Project's cultural resources studies were submitted to the State Historic Preservation Officer (SHPO) for concurrence regarding resources that are or are not eligible for the National Register of Historic Places (NRHP). Pursuant to 36 Code of Federal Regulations 800.5(c) and Stipulation X.B.2 of the *First Amended Programmatic Agreement Among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California Department of Transportation Regarding Compliance with Section 106 of the National Historic Preservation Act, as it pertains to the Administration of the Federal Aid Highway Program in California*, Caltrans determined that the Section 106 finding for the Project is a Finding of No Adverse Effect without Standard Conditions. A SHPO concurrence letter was received, dated April 17, 2024. This documentation has been included in Appendix F, *Consultations and Coordination*.

4.2.8 California Transportation Commission

The Project would seek California Transportation Commission approval following publication of the Notice of Determination for the final environmental document (FED).

4.3 TRIBAL ENTITIES

NAHC responded to the Project's NOP via SCH in a letter dated June 16, 2020. A request for a search of the Sacred Lands File and a list of interested individuals was sent to NAHC on August 3, 2020. NAHC responded on August 18, 2020, with negative results for sacred lands in the vicinity of the Area of Potential Effects and provided a list of 12 interested individuals. CCTA, with the assistance of its consultants, conducted consultation with each of the representatives on the list. Letters were sent to individuals on August 31, 2020, with a second letter following on August 17, 2021. The latter detailed Project changes and provided a new map set. A follow-up email was sent to all interested party contacts on September 10, 2021, and no responses were received at that time.

In support of an extended phase I archaeological survey that was conducted for the Project, emails (with attached letters and maps) were issued to all parties on April 12, 2023. Follow-up phone calls were conducted on May 12, 2023, and additional phone-calls and email correspondence were initiated by CCTA (in coordination with Caltrans) later the same month. All further correspondence was conducted by CCTA and Caltrans, and documentation is on file with the agencies. Coordination with the Native American tribes would continue throughout the duration of the Project. Please see Table 4-1 for additional information.

Table 4-1. Native American Consultation Efforts

Name	Tribal Affiliation	Letter Sent (2020/2021)	Email Sent (2021)	Email Sent (2023)
Irenne Zwierlein	Amah Matsun Tribal Band of Mission San Juan Bautista	8/03/2020; 8/17/2021	9/10/2021	4/12/2023
Corrina Gould	The Confederated Villages of Lisjan	8/03/2020; 8/17/2021	9/10/2021	4/12/2023
Merlene Sanchez	Guidiville Indian Rancheria	8/03/2020; 8/17/2021	9/10/2021	4/12/2023
Anne Marie Sayers	Indian Canyon Mutsun Band of Costanoan	8/03/2020; 8/17/2021	9/10/2021	4/12/2023
Monica Arellano	Muwekma Ohlone Indian Tribe of the San Francisco Bay Area	8/03/2020; 8/17/2021	9/10/2021	4/12/2023
Katherine Perez	North Valley Yokuts Tribe	8/03/2020; 8/17/2021	9/10/2021	4/12/2023

Name	Tribal Affiliation	Letter Sent (2020/2021)	Email Sent (2021)	Email Sent (2023)
Timothy Perez	North Valley Yokuts Tribe	8/03/2020; 8/17/2021	9/10/2021	4/12/2023
Andrew Galvan	The Ohlone Indian Tribe	8/03/2020; 8/17/2021	9/10/2021	4/12/2023
Dahlton Brown	Wilton Rancheria	8/03/2020; 8/17/2021	9/10/2021	4/12/2023
Jesus Tarango	Wilton Rancheria	8/03/2020; 8/17/2021	9/10/2021	4/12/2023
Antonio Ruiz	Wilton Rancheria	8/03/2020; 8/17/2021	9/10/2021	4/12/2023
Ralph Hatch	Wilton Rancheria	8/03/2020; 8/17/2021	9/10/2021	4/12/2023; 4/13/2023

Source: Far Western Anthropological Research Group, 2023

4.4 ADDITIONAL PUBLIC OUTREACH

This section discusses additional public outreach for the Project that occurred beyond the requirements of NEPA or CEQA, as well as outreach that occurred related to Measure J, Countywide Transportation Plan, and the INNOVATE 680 Program. While the feedback received is more general in nature to Measure J, INNOVATE 680 Program, and CCTA's *Action Plan* and *Countywide Transportation Plan*, this feedback helped inform Project planning and provided useful context for how the public would respond to the Project.

4.4.1 General Public Involvement

During the proposed Project's initiation phase, the INNOVATE 680 Program, CCTA, and Caltrans solicited public input through several methods, including the following:

- Multi-Media and Website (https://ccta.net/projects/innovate-680/)
    - Social Media, Project eBlasts
    - INNOVATE 680 eNewsletter
    - Ongoing INNOVATE 680 Website Updates
    - Brochure
    - Fact Sheets
    - Newsletters

- PowerPoint Presentations
- Hotline: (925) 278-5978

- Project/Public/Stakeholder Meetings
  - Environmental Meetings (Public Scoping)
  - Public Update Meeting (additional meeting)

This section briefly describes the methods used for and feedback received from the first round of public outreach conducted by CCTA and its consultants between March and April 2022 for INNOVATE 680.

4.4.1.1 Outreach Methods

Outreach was conducted to the general Contra Costa County community. Feedback was collected both in-person and virtually to provide a variety of feedback channels, including:

- 11 In-Person Pop-Up Events
- 5 Virtual Workshops
- Countywide Online Community Forum Survey
- 421 Project Flyers Distributed

4.4.1.2 In-Person Pop-Up Events and Virtual Workshops

In-person pop-up events included interactive poster boards, surveys, and project flyers, while the virtual workshops included a PowerPoint presentation and group discussion. Regardless of the event, participants were asked the same set of questions regarding transportation topics in the County (though additional feedback was welcomed and encouraged):

- What do you think transportation should look like in the future?
- What can we do to help you with your transportation needs?
- What is your bright idea for improving transportation in the County?

4.4.1.3 Comments and Frequently Mentioned Topics

From the pop-up events, virtual workshops, and online community forum survey, a total of 704 comments were collected prior to circulation of the Draft EIR/EA. Of these comments, 151 were made on the online community forum survey and the remaining 553 comments were collected during the pop-up and workshop events.

The most frequently mentioned topics in the comments received include the following (note these are not listed in priority order):

- Increase walkability and explore pedestrian-only areas
- Increase bikeability, number of bike lanes, and bike lane convenience and safety
- Ensure bicyclists and pedestrians feel safe
- Conduct safety presentations for pedestrians, cyclists, and drivers
- Bike and scooter share
- Improve last mile connections to public transit
- Bus express lanes or bus-only lanes on freeways and arterials
- Public transit improvements to frequency, hours of service, reliability, and cleanliness
- Ensure public transportation is accessible for all socioeconomic groups
- Improve paratransit and other accessible transportation options and solutions
- Safety improvements on BART and buses
- Improved parking options at major transit stations
- Plan for regional connections throughout the county and beyond
- Electrify the transportation system (public and private) and improve infrastructure
- Explore autonomous vehicles
- Decrease number of potholes on freeways and major roadways
- Decrease traffic congestion
- Improve the timing of traffic lights

4.4.2 Measure J

The Project is partially funded by Measure J. In November 2004, Contra Costa voters approved Measure J with a 71 percent vote. For over 2 years, CCTA, local governments, organizations, and residents worked to develop the *Expenditure Plan*, which specifies how the funds will be spent (Contra Costa Transportation Authority,

2011). The *Expenditure Plan*, which received the support of every Contra Costa city and town, as well as the County Board of Supervisors, includes funding for Interstate 680 (I-680) carpool lane gap closure/transit corridor improvements.

Measure J funds both capital projects and programs. Measure J also contains a Growth Management Program that is designed to help Contra Costa County plan for and accommodate the continued increases in population, households, and jobs that are expected to occur within the County through the year 2035 (Contra Costa Transportation Authority, 2021). The adoption of Senate Bill (SB) 743 shifted the transportation planning focus from performance-based analyses to transportation, land use, and planning decisions that encourage infill development, promote public health through active transportation, and reduce GHG emissions. Therefore, in 2020, CCTA reoriented the *Measure J Growth Management Plan* to focus not only on regional roadways, but also on the transportation networks serving bicycles, pedestrians, and transit.

4.4.3 Countywide Transportation Plan

CCTA's *Countywide Transportation Plan* provides the overall direction for achieving and maintaining a balanced and functional transportation system within Contra Costa County while strengthening links between land use decisions and transportation (Contra Costa Transportation Authority, 2017). This plan outlines CCTA's vision for future transportation and establishes goals, strategies, projects, and actions for achieving that vision. The *Countywide Transportation Plan* is also the detailed plan that helps inform and direct transportation funding allocated throughout Contra Costa County. On September 20, 2017, CCTA certified the Final EIR for the plan.

As part of the 2017 update of the *Countywide Transportation Plan*, the Regional Transportation Planning Committees updated their Action Plans for Routes of Regional Significance. The completion of express lanes on I-680 is included in the *Central County Action Plan* (Transportation Partnership and Cooperation , 2017). Updates to the Action Plans and the *Countywide Transportation Plan* are currently ongoing. CCTA and its consultants conducted outreach in March and April 2022, which included 11 in-person pop-up events, 5 virtual workshops, online community forum survey, and distributing flyers (Contra Costa Transportation Authority, 2022).

4.4.4 INNOVATE 680 Program

The Project is part of the INNOVATE 680 Program. The INNOVATE 680 Program was conceived as an innovative approach to improve mobility along the I-680 corridor (Contra Costa Transportation Authority, 2017). CCTA conducted a study in 2015 on potential transportation investments in the I-680 corridor that could relieve congestion and improve transit. The study was conducted collaboratively between CCTA staff and consultants, the INNOVATE 680 PAC, and a Technical Advisory Committee. The recommended investment strategy focused on improved transit service and freeway operations, with technology and infrastructure investments to enhance mobility.

4.4.4.1 Public Survey (Wave 1)

From November 2020 through January 2021, CCTA conducted a survey of corridor residents about their transportation habits (referred to as "Wave 1") (INNOVATE 680, 2021). Overall, 50,000 residents were contacted during Wave 1 and 1,533 provided complete responses by January 4, 2021, representing an approximate 3.1 percent response rate. This survey was designed specifically to provide helpful information to the INNOVATE 680 Program and its suite of projects. The responses to this survey also helped identify transportation habits along the corridor.

4.4.4.2 Public Survey (Wave 2)

A second wave of the survey was conducted to understand current transportation behaviors, mode use and frequency, and perceived barriers and benefits for mode shift (referred to as "Wave 2"). The survey was open from November 1, 2022, to December 17, 2022. Out of the 1,533 residents who took the survey in Wave 1, 1,131 opted in to be contacted for future research (458 did not). In late 2022, the 1,311 who opted in were invited to participate in a follow-up survey via email and text. In total, 403 residents submitted complete responses for Wave 2, representing an approximate 26.2 percent response rate from the original sample and 35.6 percent of those that were invited to participate in Wave 2. A $10 gift card was provided as incentive for taking the survey.

4.5 CIRCULATION, REVIEW, AND COMMENT ON THE DRAFT ENVIRONMENTAL DOCUMENT

4.5.1 Circulation of the Draft Environmental Document

The Draft EIR/EA was available for public review from May 8, 2024, through June 24, 2024 (47-day review period). The Project website (ccta.net/expresslane) was updated with copies of the Notice of Completion (NOC), Notice of Availability (NOA), and an electronic version of the Draft EIR/EA. A link to the Project Website was also available on Caltrans District 4 website (https://dot.ca.gov/caltrans-near-me/district-4/d4-popular-links/d4-environmental-docs).

The NOC, NOA, and an electronic copy of the Draft EIR/EA were also posted on the State Clearinghouse's CEQAnet on May 7, 2024. The NOC and NOA were also posted at the Contra Costa County Clerk's office. In addition, NOAs were sent via email and postal mail to project stakeholders (see Chapter 6.0, *Distribution List*).

Hard copies of the Draft EIR/EA were available for public review at Contra Costa Transportation Authority, 2999 Oak Road #100, Walnut Creek, CA 94597; Caltrans District 4, 111 Grand Avenue #300, Oakland, CA 94612; and the following libraries: Martinez Library, Concord Library, Pleasant Hill Library, Walnut Creek Library, Lafayette Library, Ygnacio Valley Library, Danville Library, San Ramon Library, Dougherty Station Library, and Moraga Library.

Technical studies were made available by contacting Caltrans District 4 upon request. Individuals with sensory disabilities were provided the opportunity to request the Draft EIR/EA and technical studies in braille, in large print, on audiocassette, or on computer disk during the public comment period.

Notifications of the Draft EIR/EA and the public meetings/hearings were published in the *East Bay Times* (English; May 8 and June 3, 2024), *Sing Tao* (Chinese; May 8 and June 3, 2024), *El Observador* (Spanish; May 8 and June 3, 2024), and *Mercury News* (online; May 8 and May 28, 2024). A postcard mailer announcing the public meetings/ hearings and the beginning of the public comment period was mailed on May 8, 2024, to 484 stakeholders and 7,256 properties along the Project corridor.

Just prior to and during the release of Draft EIR/EA, the Project Team conducted grassroots outreach in three local communities impacted by the Project with the intention of further educating the public and promoting the opportunity to provide feedback on the Project. Materials, such as fact sheets, mailers, and comment cards, were made available at the following events: Martinez Farmers' Market (May 5, 2024), Danville Farmers' Market (May 11, 2024), Martinez King of the County Barbeque & Music Festival (June 15, 2024), and Concord Farmers' Market (June 18, 2024).

See Appendix M, *Outreach Summary Report,* for additional details, including copies of the NOA, NOC, and advertisements.

4.5.2 Public Meetings/Hearings

Caltrans, in partnership with CCTA, held two public meetings/hearings during the public comment period for the Draft EIR/EA. An in-person public meeting/hearing was held on June 5, 2024, from 6:00 to 8:00 p.m., and a virtual public meeting/hearing was held on June 6, 2024, from 6:00 to 8:00 p.m. via Zoom. Spanish and Mandarin interpreters were available at both meetings/hearings. See Appendix M, *Outreach Summary Report*, for additional details.

4.5.3 Federal, State, and Local Agency Coordination

NOAs were sent via email and postal mail to federal, State, and local agencies (see Chapter 6.0, *Distribution List*). Before and throughout the public comment period for the Draft EIR/EA, the Project Team presented to federal, State, and local agencies to provide a brief Project update and to remind them to submit comments during the formal comment period, which included the following:

- INNOVATE 680 PAC: February 8, 2023
- INNOVATE 680 PAC: October 11, 2023 (virtual)
- Transportation Partnership and Cooperation (TRANSPAC) Technical Advisory Committee: October 26, 2023 (virtual)

- TRANSPAC Board: November 9, 2023 (virtual)
- Southwest Area Transportation Committee (SWAT) Technical Advisory Committee: November 15, 2023 (virtual)
- SWAT Board: December 4, 2023 (in-person)
- INNOVATE 680 PAC: April 10, 2024 (in-person)
- East Bay Regional Parks District: May 13, 2024 (virtual)
- MTC: June 6, 2024 (virtual)
- City of Walnut Creek: June 12, 2024 (virtual)
- U.S. EPA: June 20, 2024 (virtual)

4.5.4 Comments Received on the Draft Environmental Document

Table 4-2 contains a list of the individuals, organizations, and agencies that submitted comments on the Draft EIR/EA during the public comment period. Comment letters are provided in Appendix G, *Comment Letters and Responses*.

Table 4-2. Comments Received During Public Comment Period for Draft EIR/EA

Date Received	Commenter	Format of Comment (e.g. email, comment card)
Agencies		
5/13/2024	California Air Resources Board	email
5/15/2024	California Air Resources Board	email
6/11/2024	Contra Costa County Public Works Department	email
6/12/2024	Bay Area Air Quality Management District	voicemail
6/21/2024	City of Walnut Creek	letter
6/24/2024	City of Concord	letter
6/24/2024	Bay Area Air Quality Management District	letter
5/29/2024	California Department of Transportation	email
6/24/2024	U.S. Environmental Protection Agency	Letter
Elected Officials		
7/14/2024	Newell Arnerich, Town of Danville	website form

Date Received	Commenter	Format of Comment (e.g. email, comment card)
7/24/2024	Chris Kelley, City of Hercules	website form
Public		
5/8/2024	Alphe Springer	website form
5/17/2024	Bhumil Shah	website form
5/20/2024	Daniel Rivera	website form
5/20/2024	Natalie Miles	email
5/21/2024	Yuliana Tjeng	website form
5/21/2024	Nick L	email
5/21/2024	Tina Segrove	email
5/21/2024	Trevor Butler	website form
5/22/2024	Chris Land	email
5/22/2024	Rosa Esquivel	email
5/25/2024	Dorette English	email
6/5/2024	NJ	website form
6/5/2024	Matt Dussing	email
6/5/2024	Anonymous	comment card
6/6/2024	Eddie Bursan	voicemail
6/6/2024	Suzanne Murray	email
6/8/2024	Cara DeJong	email
6/8/2024	Gerald Cauthen, Bay Area Transportation Working Group	email
6/12/2024	Dani Lanis, Bike East Bay	email
6/12/2024	Christopher Sanders	website form
6/13/2024	Eric Ardell	website form
6/12/2024	Erik J Owens	website form
6/13/2024	Patrick J Kelly	website form
6/13/2024	Elizabeth Harvey Roberts	website form
6/13/2024	Ron Elsdon	website form
6/13/2024	Mark Oney	website form

Date Received	Commenter	Format of Comment (e.g. email, comment card)
6/13/2024	Jody Naas	website form
6/13/2024	Brian K Walker	website form
6/13/2024	Laura Ferree	website form
6/13/2024	Tracy Farhad	email
6/14/2024	Jackie Ammon	website form
6/13/2024	Tamara Struminger	email
6/14/2024	Adam Falcon	website form
6/14/2024	Janis	website form
6/14/2024	Julia Drake	website form
6/13/2024	Burton Feldstein	website form
6/14/2024	Mark Isola	website form
6/14/2024	Newell Arnerich	website form
6/14/2024	Janis Lavine Arnerich	website form
6/14/2024	Anthony Newell	website form
6/14/2024	Jim Stewart	email
6/14/2024	Julie Riele	website form
6/14/2024	Hisham Noeimi	website form
6/14/2024	Linda Quick	website form
6/15/2024	Todd Laird	website form
6/15/2024	Alex Hill	website form
6/16/2024	Roya Brake	website form
6/17/2024	Em Kay	website form
6/17/2024	Pauline W	website form
6/17/2024	Jenn Bible	website form
6/17/2024	Robin Taylor	website form
6/17/2024	Len Sauer	website form
6/17/2024	Chalotte Westbrook	website form
6/17/2024	April M Graham	website form
6/17/2024	James Muzzini	website form

Date Received	Commenter	Format of Comment (e.g. email, comment card)
6/17/2024	Sordini Jeannine	website form
6/18/2024	George	website form
6/18/2024	Ishai Crane	website form
6/19/2024	Jackie Simone	website form
6/20/2024	Jackson Hurst	email
6/20/2024	Jeff Gibson	website form
6/22/2024	Robert Sanguedolce	website form
6/22/2024	Jay S McCoy	website form
6/22/2024	Curtis Olliff	website form
6/23/2024	Anonymous	website form
6/24/2024	Suzanne	email
6/24/2024	Jason A Bezis	letter
6/24/2024	Elizabeth Reid-Wainscoat, Center for Biological Diversity	letter
6/24/2024	David Schonbrunn, TRANSDEF	letter
6/24/2024	Zack Deutsch-Gross, TRANSFORM	letter

4.5.5 Response to Comments

All comment letters received during the comment period for the Draft EIR/EA and responses are provided in Appendix G, *Comment Letters and Responses*. The comment letters are included in the order shown in Table 4-2.

Master responses have been prepared to address similar comment issues raised by multiple commenters. When an individual comment raises an issue discussed in a master response, the response to that individual comment includes a cross-reference to the appropriate master response (e.g., “see Master Response A”).

The Master Responses address the following topics:

- Master Response A: Selection of Preferred Alternative
- Master Response B: Induced Travel Demand and Vehicle Miles Traveled Mitigation
- Master Response C: Environmental Justice and Equity

Pursuant to Public Resources Code Section 21092.5(a), responses to agency comments will be provided at least 10 days prior to Project approval.

4.5.5.1 Master Response A: Selection of Preferred Alternative

Commenters expressed the desire for the selection of a specific Build Alternative or the No-Build Alternative. Section 1.4.5.1, *Identification of a Preferred Alternative*, provides additional information regarding the factors the PDT considered in the selection of the preferred alternative.

The Draft EIR/EA evaluated four Build Alternatives (Alternatives 1C, 2, 3, and 5) and the No-Build Alternative. The PDT formally selected Alternative 2 (Reduce the Gap Plus Braided Ramps) as the preferred alternative for the Project on September 10, 2024. All comment letters received during scoping and the circulation of the Draft EIR/EA were considered in the selection of the preferred alternative.

Alternative 2 would add an express lane on northbound I-680 from Livorna Road to State Route (SR) 242 with a 2-mile gap through the SR-24 Interchange, construct braided ramps between the Lawrence Way on-ramp and Treat Boulevard off-ramp, and convert the existing high-occupancy vehicle (HOV) lane to an express lane from SR-242 to the Arthur Road on-ramp.

As described in more detail in Section 1.4.5.1, *Identification of a Preferred Alternative*, the PDT determined that Alternative 2 would best accomplish the Project's stated purpose and need. Table S-1 in the *Summary* provides a summary comparing the major environmental effects of each Build Alternative to the No-Build Alternative. Section 1.4.4, *Comparison of Alternatives*, which was included in the Draft EIR/EA, provides a brief summary comparing the operational benefits of each evaluated alternative. Additional information can be found in Section 2.1.8, *Traffic and Transportation/Bicycle and Pedestrian Facilities*, and the Project's Traffic Operations Analysis Report (TOAR) (DKS Associates, 2023), including the TOAR's supporting documentation. Figure 4-1 and Figure 4-2 (i.e., heat maps) have been provided below. These figures compare the projected operational speeds for each alternative on I-680 (general purpose and managed lanes) and SR-24 for the Opening Year and Design Year.

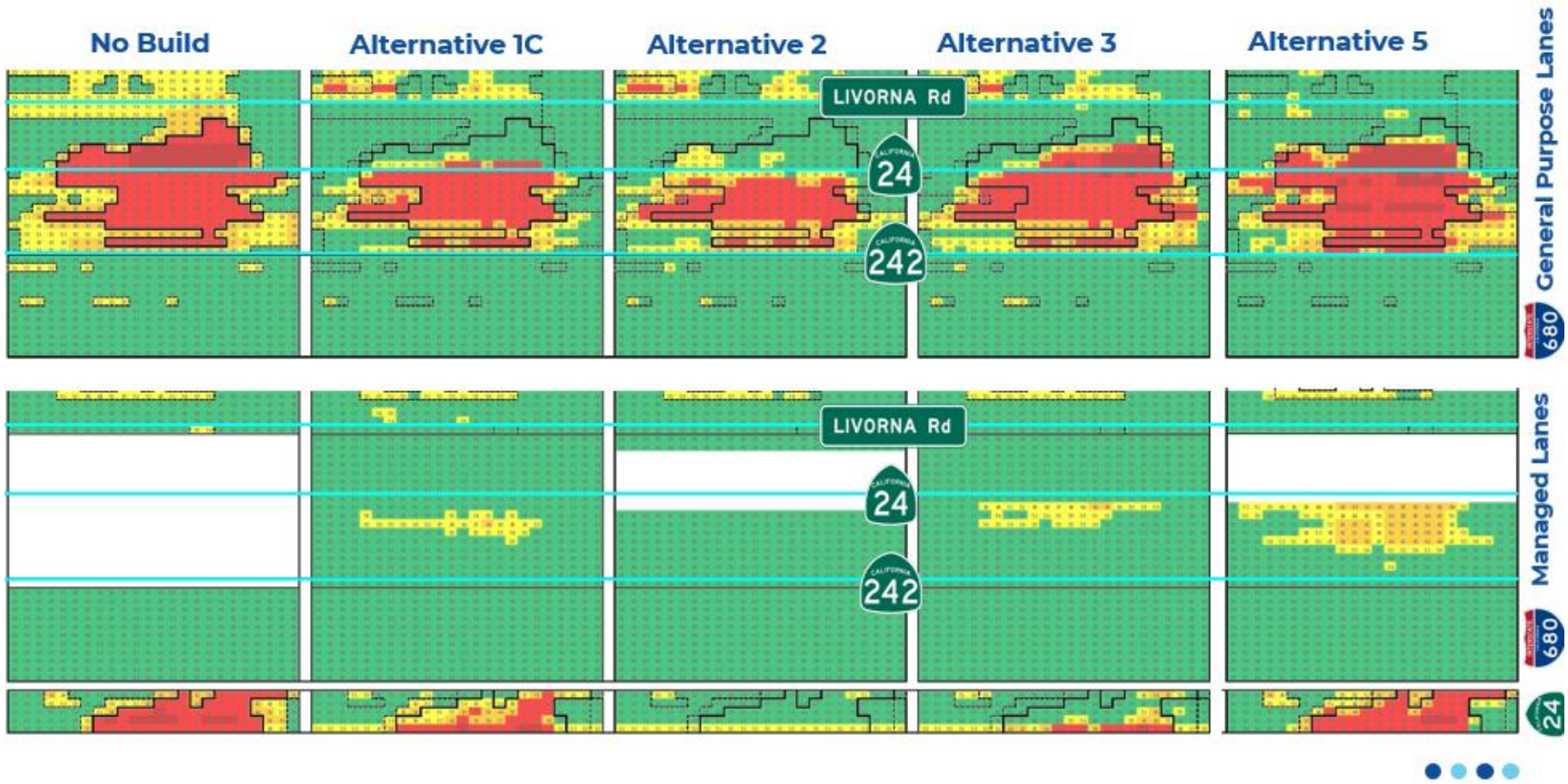


Figure 4-1. Operational Speed Heat Map of the Build Alternatives for the Opening Year (2027)

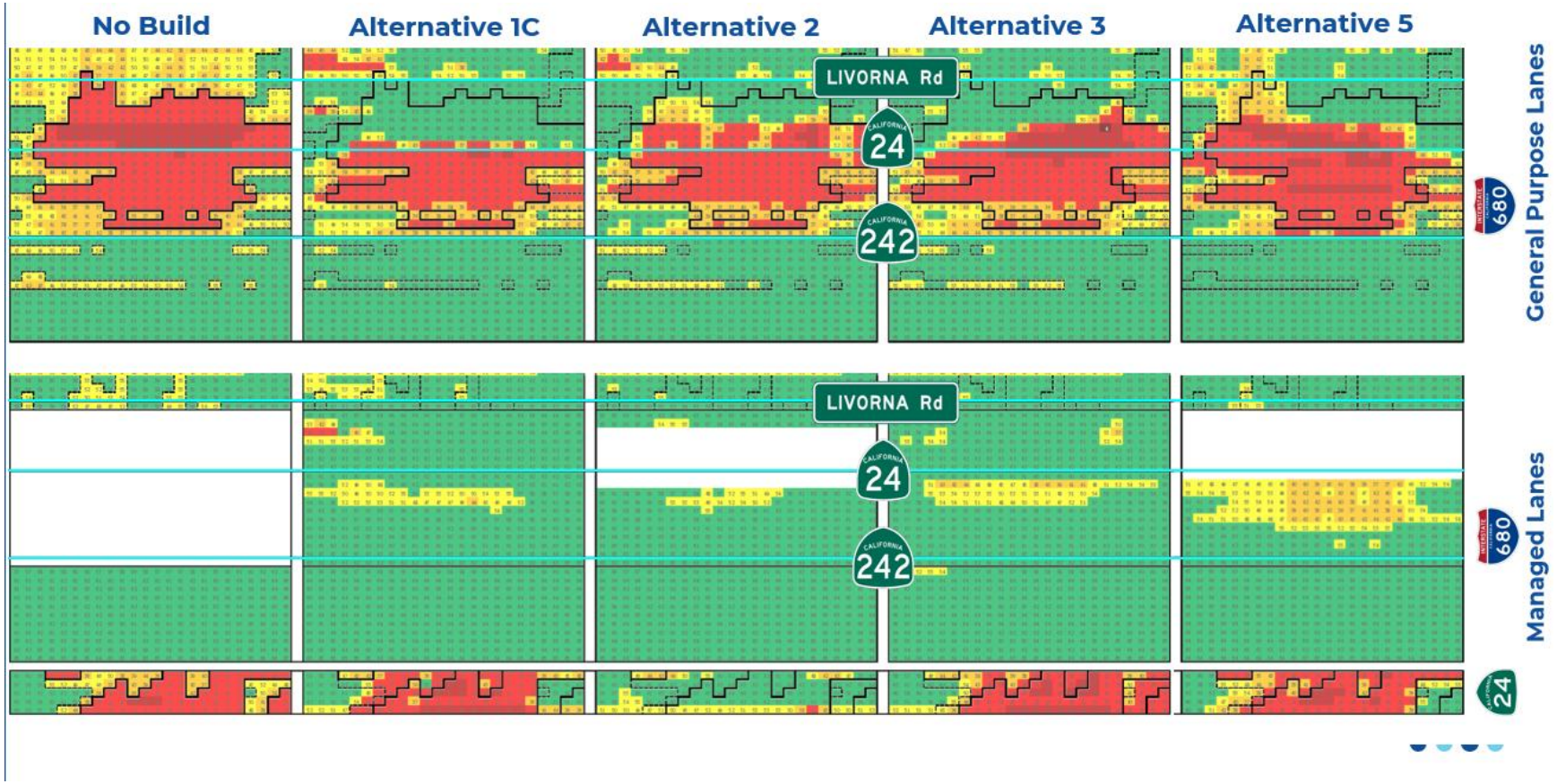


Figure 4-2. Operational Speed Heat Map of the Build Alternatives for the Design Year (2047)

4.5.5.2 Master Response B: Induced Travel Demand and Vehicle Miles Traveled Mitigation

Comments were received regarding the travel demand model used and the vehicle miles traveled (VMT) mitigation measures selected. VMT is an essential traffic metric that calculates vehicle travel within a certain area. As described in Caltrans, Transportation Analysis under CEQA (TAC) (California Department of Transportation, 2025), any "project that results in an increase in VMT when comparing the future build alternative to the future no-build alternative (i.e., the VMT is higher under the future build scenario) will generally be considered significant, and mitigation will be required" under Senate Bill (SB) 743.

VMT Analysis Tools and Methodology

Several commenters provided feedback, questions, and opinions related to the induced VMT calculation methodologies and tools used to evaluate alternatives. The Project's induced travel impacts were analyzed using travel forecasting and modeling techniques conforming to existing standards, guidance, policies, and best practices.

As described in Section 2.1.8, *Traffic and Transportation/Pedestrian and Bicycle Facilities*, the traffic analysis applied a model benchmarking approach to provide VMT analysis. The benchmarking methodology included the following steps:

- Apply the National Center for Sustainable Transportation (NCST) Induced Travel Calculator (NCST Calculator) for a hypothetical general-purpose lane addition in the same location as the Project and identify induced VMT.
- Add the same hypothetical general-purpose lane to the Countywide Model (CCTA) and identify the trips that would benefit from the lane addition.
- Apply factors within the travel model to increase the trips that would benefit from the lane addition at an order of magnitude equal to the VMT increase estimated by the NCST Calculator.
- Make the factors proportional to travel time savings (between the No-Build scenario and the express lane addition scenario) so that the trip and VMT increases can be scaled to alternatives that provide different amounts of travel time savings.
- Apply the travel model, with the induced VMT factor formulas, to the Project alternatives.

The NCST Calculator was used only as a measure of potential induced VMT associated with the addition of a general-purpose lane compared to the travel model's estimate of induced VMT with the addition of a general-purpose lane (Kittelson & Associates, 2020). The NCST Calculator was applied to estimate the induced VMT for a lane addition of 6.41 miles in the San Francisco-Oakland-Hayward Metropolitan Statistical Area (MSA).

The estimated induced VMT is 49.6 million annual VMT. Dividing by 365 days per year resulted in an estimate of 135,890 induced VMT per day.

This increment of additional VMT is within 1.9 percent of the additional VMT predicted by the NCST Calculator for the addition of a general-purpose lane. The Caltrans Transportation Analysis Framework (California Department of Transportation, 2020c) allows a difference of up to 20 percent when comparing a travel model estimate with the NCST Calculator. Therefore, Caltrans determined that this adjustment factor was considered to be calibrated sufficiently (Kittelson & Associates, 2020). The calibrated model adjustments closely replicate the induced VMT estimated by the NCST Calculator for the "benchmark" scenario. The application of the methodology to an express lane alternative resulted in reasonable differences in travel times and induced VMT relative to the No-Build and "benchmark" scenarios.

The NCST Calculator does not automatically exclude heavy duty trucks from the induced travel estimates. *NCST Calculator Truck Adjustment* (California Department of Transportation, 2023) further details reduction adjustments to NCST-generated elasticity values for Class 1 facilities by 29 percent and Class 2 and 3 facilities by 22 percent, as per the research supporting the NCST Calculator. The Contra Costa Countywide travel model assigns trucks as a separate vehicle type on each road segment; therefore, VMT associated specifically with trucks was able to be tabulated for the Project.

The travel model estimates that truck VMT would account for approximately 3.2 percent of total Opening Year (2027) VMT and 3.2 percent of total Design Year (2047) VMT in the MSA for all Build Alternatives. However, truck VMT would account for different amounts of the induced VMT increment between the No-Build Alternative and each of Build Alternatives. Excluding truck VMT would reduce the induced VMT in the Opening Year (2027) by 3.8 percent for Alternative 1C, 2.7 percent for Alternative 2, and 3.9 percent for Alternative 3. Excluding truck VMT would reduce the induced VMT in the Design Year (2047) by 2.7 percent for Alternative 1C, 2.4 percent for Alternative 2, and 2.9 percent for Alternative 3. These truck VMT reductions are much smaller than the 29 percent reduction permitted when induced VMT is calculated using the NCST Calculator. Please note that the traffic information provided for the air quality analysis was based on the more complete and higher tabulation of VMT (Kittelson & Associates, 2023).

Caltrans has determined that the travel forecasting and modeling techniques used in the TOAR (DKS Associates, 2023) and its supporting documents conform to existing standards, guidance, policies, and best practices. In addition, Caltrans has determined that the level of detail in the EIR/EA complies with CEQA and NEPA. No changes to the EIR/EA were required.

VMT Mitigation under CEQA

According to Caltrans' *SB 743 Program Mitigation Playbook* (Draft), "Caltrans seeks to avoid inducing new traffic, as measured in VMT, as it manages and evolves the State

Highway System" (California Department of Transportation, 2022). Caltrans has determined that the potential for a project to induce VMT is the basis for a significant impact determination under SB 743 (i.e., CEQA) (California Department of Transportation, 2020a). In addition, Caltrans guidance requires that potential VMT impacts be addressed with mitigation before a final significance determination is made (California Department of Transportation, 2021).

Caltrans guidance, *SB 743, Environmental Essentials in Project Development and Delivery* (California Department of Transportation, 2021), includes suggested steps that should be taken before a FED is circulated in order to demonstrate that all feasible mitigation strategies have been exhausted and there are no further options available. This includes the development of risk assessments and collaboration with Caltrans' SB 743 Management Team. "For mitigation measures to be considered adequate, they need to be reasonable, feasible, effective, and [Caltrans'] commitment to their implementation needs to be assured" (California Department of Transportation, 2021). Caltrans' *SB 743 Program Mitigation Playbook* (Draft) (California Department of Transportation, 2022) provides guidance regarding mitigation methods for VMT induced by projects that increase highway capacity.

Prior to the public comment period for the Draft EIR/EA, the PDT worked with local jurisdictions and other stakeholders to identify potential transit, active transportation, and land use development projects that could be used to offset the Project's induced VMT as well as other mitigation options, including incentives to reduce vehicle trips and increase transit use. Following this solicitation process, a list of mitigation projects was evaluated for highest VMT reduction and analyzed further for feasibility and implementation ability. The results of the solicitation effort yielded the following CEQA mitigation measures for Alternatives 1C, 2, and 3:

- *I-680 Express Bus Service* (**TRAN-MM-1**): The I-680 corridor currently does not have a train or bus service that connects the Tri-Valley area to Martinez. This measure would provide a new I-680 express bus service and funding to rebrand, refurbish, and upgrade six existing buses for interim service (before hydrogen fuel-cell buses are available) and acquire six hydrogen fuel-cell buses (and 1 spare) when they are available for purchase.

- *Shared Mobility Hubs* (**TRAN-MM-2**): Shared mobility hubs would enhance the operations of the I-680 Express Bus Service and provide connections to additional services. Hubs will have services and amenities that will make it easier for travelers to connect to transit, micromobility, and car share options. The Project would pursue funds and ensure the implementation of the following mobility hubs: Bollinger Canyon Road, Walnut Creek BART Station, and Martinez Amtrak Station.

- *Transportation Demand Management (TDM) Program Augmentation* (**TRAN-MM-3**): The Project would provide additional funding to the County's existing TDM program (511 Contra Costa) to incentivize the use of alternatives to single-occupant vehicles within Contra Costa County.

Section 3.2.17, *Transportation*, has been revised to include additional information regarding the process. In addition, Caltrans added Alternative 5 as a mitigation alternative to be studied in the Draft EIR/EA. Alternative 5 is similar to Alternative 2 (preferred alternative) but would not add a new lane on northbound I-680 south of SR-242. Instead, Alternative 5 would convert a general-purpose lane to an express lane south of the SR-242 Interchange. Caltrans screened Alternative 5 from requiring VMT analysis and mitigation in accordance with the TAC (California Department of Transportation, 2020b; 2025).

As discussed in Master Response A, the PDT selected Alternative 2 as the preferred alternative for the Project following the Draft EIR/EA public comment period. Alternative 2 would generate approximately 82,353 VMT by the Design Year (2047). CEQA Mitigation Measures **TRAN-MM-1**, **TRAN-MM-2**, and **TRAN-MM-3** would seek to collectively offset the Project's average daily VMT impacts for a period of 20 years and could result in a mode shift that would continue beyond 20 years. The proposed 20-year implementation period is consistent with Caltrans' standard design period for a project's traffic analysis. However, there is some uncertainty as to whether 20 years would be deemed sufficient, considering the full life cycle of the Project. While a constructed project may be viewed to be in place indefinitely, implementing VMT mitigation strategies in perpetuity that involve ongoing operation and maintenance costs was not feasible for this Project due to the uncertainty of indefinite stable funding.

Sections 1.4.1.8, *Project Funding*; Section 1.4.2, *Unique Features of Build Alternatives*; and Section 3.2.17, *Transportation*, have been revised to include more up-to-date information regarding the Project's current budget and funding. VMT mitigation is not currently fully funded. CCTA is committed to continuing to work with the express lane operator (Bay Area Infrastructure Financing Authority) to seek funding these mitigation measures for a 20-year period. Caltrans has determined that a Statement of Overriding Consideration is required for the Project because full mitigation funding has not been secured, and indefinite ongoing mitigation funding is not assured.

4.5.5.3 Master Response C: Environmental Justice and Equity

Comments were received regarding Caltrans' environmental justice determination and the Project's equity impacts. Some comments suggested that express lanes would not be equitable for all users, specifically low-income users. Several commenters expressed concern with Alternative 5, in particular, because this alternative would convert an existing general-purpose lane to an express lane.

Environmental justice and equity are not required topics under CEQA. Under NEPA, Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (1994) has been rescinded pursuant to EO 14173, *Ending Illegal Discrimination and Restoring Merit-Based Opportunity* (2025), and EO 14096, *Revitalizing Our Nation's Commitment to Environmental Justice for All* (2023) has been rescinded pursuant to EO 14148, *Initial Rescissions of Harmful Executive Orders and Actions* (2025). In addition, EO 13985, *Advancing Racial Equity and Support for Underserved Communities Through the Federal Government* (2021)

has been rescinded pursuant to EO 14148. However, consideration of environmental justice was included in the analyses for the Draft EIR/EA, prior to the rescission of EOs 12898 and 14096, and therefore has been retained in the FED for informational purposes only (see Section 2.1.6, *Environmental Justice*). Consideration of equity was included in the Project's Community Impacts Assessment (HDR Engineering, Inc., 2023), prior to the rescission of EO 13985.

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The preparation of this environmental document and project design involved a team of California Department of Transportation and Contra Costa Transportation Authority (Project Sponsor) personnel and consultants.

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The following agencies, organizations, and individuals received printed or electronic copies of this environmental document. Agency names marked with an asterisk (*) received copies of the Draft EIR/EA through the State Clearinghouse. Comment letters on the Draft EIR/EA were received from agencies, organizations, and individuals whose names are bolded.

Pursuant to Public Resources Code Section 21092.5(a), responses to agency comments will be provided at least 10 days prior to certification.

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Walnut Creek City Council Mayor Cindy Silva 1666 North Main Street Walnut Creek, CA 94596	Walnut Creek City Council Councilmember Matt Francois 1666 North Main Street Walnut Creek, CA 94596	Pleasant Hill City Council Councilmember Zac Shess zshess@pleasanthillca.org 100 Gregory Lane Pleasant Hill, CA 94523
Pleasant Hill City Council Mayor Sue Noack 100 Gregory Lane Pleasant Hill, CA 94523	Pleasant Hill City Council Councilmember Amanda Szakats 100 Gregory Lane Pleasant Hill, CA 94523	Concord City Council, District 1 Councilmember Laura Hoffmeister laura.hoffmeister@cityofconcord.org 1950 Parkside Drive Concord, CA 94519
Concord City Council, District 2 Vice Mayor Carlyn Obringer carlyn.obringer@cityofconcord.org 1950 Parkside Drive Concord, CA 94519	Concord City Council, District 3 Councilmember Dominic Aliano dominic.aliano@cityofconcord.org 1950 Parkside Drive Concord, CA 94519	Concord City Council, District 4 Councilmember Pablo Benavente pablo.benavente@cityofconcord.org 1950 Parkside Drive Concord, CA 94519
Concord City Council, District 5 Vice Mayor Laura Nakamura laura.nakamura@cityofconcord.org 1950 Parkside Drive Concord, CA 94519	Martinez City Council Mayor Brianne Zorn bzorn@cityofmartinez.org 525 Henrietta Street Martinez, CA 94553-2395	Martinez City Council, District 1 Vice Mayor Jay Howard jhoward@cityofmartinez.org 525 Henrietta Street Martinez, CA 94553-2395
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San Ramon Transportation Advisory Committee Committee Member Joy Bhattacharya 7000 Bollinger Canyon Rd San Ramon, CA 94583	San Ramon Transportation Advisory Committee Committee Member Edward Carranza Jr 7000 Bollinger Canyon Rd San Ramon, CA 94583	San Ramon Transportation Advisory Committee Chamber of Commerce Representative Wade Luckhardt 7000 Bollinger Canyon Rd San Ramon, CA 94583
Alamo Municipal Advisory Council (MAC) Councilmember Sharon Burke 1025 Escobar Street Martinez, CA 94553	Alamo Municipal Advisory Council (MAC) Chair Heather Chaput 1025 Escobar Street Martinez, CA 94553	Alamo Municipal Advisory Council (MAC) Councilmember Anne Struthers 1025 Escobar Street Martinez, CA 94553
Alamo Municipal Advisory Council (MAC) Councilmember Cecily Barclay 1025 Escobar Street Martinez, CA 94553	Alamo Municipal Advisory Council (MAC) Councilmember Robert Brannan 1025 Escobar Street Martinez, CA 94553	Alamo Municipal Advisory Council (MAC) Michelle Parkinson, Alternate 1025 Escobar Street Martinez, CA 94553
Alamo Municipal Advisory Council (MAC) Councilmember Robert Mowat 1025 Escobar Street Martinez, CA 94553	Alamo Municipal Advisory Council (MAC) Vice Chair Michaela Straznicka MD, FACS 1025 Escobar Street Martinez, CA 94553	-

6.5 UTILITIES

Central Contra Costa Sanitary District Attn: Roger S. Bailey, General Manager 5019 Imhoff Place Martinez, CA 94553	Contra Costa Water District Attn: Rachel Murphy, General Manager P.O. Box H20 Concord, CA 94524	Pacific Gas & Electric Company P.O. Box 997300 Sacramento, CA 95899-7300
AT&T 5001 Executive Pkwy San Ramon, CA 94583	Verizon Corporate Headquarters 1095 Avenue of the Americas New York, NY 10036	Bay Area Infrastructure Financing Authority Bay Area Metro Center 375 Beale Street, Suite 800 San Francisco, CA 94105-2066
East Bay Municipal Utility District Attn: Clifford C. Chan, General Manager P.O. Box 24055 MS 42 Oakland, CA 94623-1055	Comcast 3011 Triad Dr, Livermore, CA 94551	Kinder-Morgan 1100 Town & Country Road #600 Orange, CA 92868
Wave Broadband 3700 Monte Villa Parkway Bothell, WA 98021	-	-

6.6 REGIONAL TRANSPORTATION PLANNING COMMITTEES

Tri-Valley Transportation Council, Attn: Sai Midididdi - TVTC Administrator Associate Civil Engineer (Traffic) City of Dublin sai.midididdi@dublin.ca.gov 100 Civic Plaza Dublin, CA 94568	TRANSPAC Attn: Matt Todd, Managing Director matt@graybowenscott.com 1211 Newell Avenue, Suite 200 Walnut Creek, CA 94596	Southwest Area Transportation Committee Attn: Chris Weeks, Division Manager 7000 Bollinger Canyon Road San Ramon, CA 94583-

6.7 MEDIA

East Bay Times Attn: Judith Prieve, Contra Costa County Editor 2121 N. California Blvd. Suite 290 Walnut Creek, Ca 94596	Tri-Valley East Bay Times Attn: Cecily Burt, Bay Area Focus Editor cburt@bayareanewsgroup.com 2121 N. California Blvd. Suite 290 Walnut Creek, Ca 94596	92.1 KKDV Radio (Diablo Valley) Attn: Jim Hampton, Content Director 7901 Stoneridge Dr Pleasanton, CA 94588
Martinez News-Gazette Attn: Rick Jones, Editor 802 Alhambra Ave Martinez, CA 94553	Concord Transcript 175 Lennon Lane, Suite 100 Walnut Creek CA 94598	-

6.8 ADVOCACY GROUPS

Save Mount Diablo Attn: Edward Sortwell Clement, Jr., Executive Director tclement@savemountdiablo.org 201 N. Civic Drive, Suite 190 Walnut Creek, CA 94596	Sierra Club, San Francisco Bay Chapter (Mount Diablo Group) Attn: Martha Kreeger, Chair; Mark Van Landuyt, Contra Costa Green New Deal Committee Chair/Interim Secretary P.O. Box 2663 Berkeley, CA 94702	**Transform** **Attn: Zack Deutsch-Gross, Policy Director** **560 14th Street, Suite 400** **Oakland, CA 94612**
Greenbelt Alliance Attn: Amanda Brown-Stevens, Executive Director abrownstevens@greenbelt.org P.O. Box 170159 San Francisco, CA 94117	Concord Family Service Center / Catholic Charities of East Bay Region Attn: Mary Kuhn, Deputy Chief of Communications 2120 Diamond Boulevard, #220 Concord, CA 94520	North Richmond Municipal Advisory Committee Attn: Tania Pulido, Staff Administrator 515 Silver Avenue North Richmond, CA 94801
Council of Business and Industry West Contra Costa County Attn: Rauly Butler, Executive Director rauly@councilofindustries.com P.O. Box 70088 PT. Richmond, CA 94807	Men and Women of Valor Attn: Pamela Saucer-Bilbo, Director 1350 Kelsey St. Richmond, CA 94804	Healthy Richmond Attn: Roxanne Carrillo Garza, Senior Director 1015 Nevin Avenue, Suite 101 Richmond, CA 94801

Contra Costa County Racial Justice Coalition Attn: Patricia Aguiar, Contra Costa Community Outreach Coordinator paguiar@calorganize.org 322 Harbour Way, #5 Richmond, CA 94801	Contra Costa Taxpayers Association Attn: James Pezzaglia, 1st Vice President P.O. Box 27 Martinez, CA 94553-0000	Contra Costa Society of Saint Vincent de Paul Attn: Barbara Hunt, Development Director b.hunt@svdp-cc.org 2210 Gladstone Drive Pittsburg, CA 94565
East Bay Housing Organizations Attn: Lindsay Haddix, Executive Director 538 9th Street, Suite 200 Oakland, CA 94607	East Oakland Collective Attn: Candice Elder, Founder and Executive Director P.O. Box 5382 Richmond, CA 94801	First 5 Contra Costa Children and Families Commission Attn: Brian Kelley, Communications Specialist I bkelley@first5coco.org 4005 Port Chicago Hwy Suite 120 Concord, CA 94520
La Clínica Monument Attn: Jane Garcia, CEO info@laclinica.org 2000 Sierra Rd, Concord, CA 94518	Monument Impact Attn: Tony Bravo, Community Engagement Director 1760 Clayton Road Concord, CA 94520-2700	Multi-Faith ACTION Coalition Attn: Melody Howe Weintraub, Chair/Cochair-Advocacy 3260 Blume Drive, Suite 110 Richmond, CA 94806
Neighborhood House of North Richmond Attn: Lloyd Madden, Board President and CEO 3065 Richmond Parkway, Suite 113 Richmond, CA 94806-1904	Neighborhood House of Richmond Attn: Rev. Andre Shumake P.O. Box 2261 Richmond, CA 94802-1261	Pittsburg Youth Action pittsburgyouthaction@gmail.com
Rich City Rides Bike Shop 1500 C MacDonald Avenue Richmond, CA 94801	Richmond Annex Neighborhood Council Attn: Garland Ellis P.O. Box 5436 Richmond, CA 94805-0000	Richmond Community Foundation Attn: Iris Podschun, Senior Director of Coaching and Collaboration 3260 Blume Drive, Suite 110, Richmond, CA 94806
Y&H Soda Foundation Attn: Luis Arteaga, Chief Executive Officer 1635 School Street Moraga, CA 94556-0000	Richmond Main Street Attn: Andrea Portillo-Knowles, Executive Director 1600 Nevin Plaza Richmond, CA 94801	Saffron Strand, Inc. Attn: Chysandra Nair, Secretary and Treasurer 147 W. Richmond Avenue, Suite E Richmond, CA 94801
Salvation Army of Concord Attn: Ann Marguerite Jones, Corps Officer 3950 Clayton Road Concord, CA 94521	San Ramon Valley Horsemen's Association Attn: Danielle Coburn, President P.O. Box 403 Danville, CA 94526-0403	Chronicle Season of Sharing Contra Costa County Attn: Elaine Lo, Treasurer & Secretary P.O. Box 7844 San Francisco, CA 94120
The Watershed Project Attn: Juliana Gonzalez, Executive Director 1327 South 46th Street, Bldg. 155 Richmond, CA 94804	Bay Area Transportation Working Group Attn: Gerald Cauthen, President	**Bike East Bay** **Attn: Dani Lanis, Advocacy Manager** **Mailing address: PO Box 1736** **Oakland, CA 94604**

Center for Biological Diversity **Attn: Elizabeth Reid-Wainscoat, Center for Biological Diversity**	**Transportation Solutions Defense and Education Fund** **Attn: David Schonbrunn** **PO Box 151439** **San Rafale, CA 94915**	

6.9 LARGE BUSINESSES

Sunvalley Shopping Center 1 Sunvalley Blvd Concord, CA 94520	The Veranda Attn: Izamar Hook, Media Relations General Manager 2001 Diamond Blvd #2003 Concord, CA 94520	John Muir Health, Walnut Creek Medical Center Attn: Ben Drew, Communications Chief 1601 Ygnacio Valley Road Walnut Creek, CA 94598
Kaiser Permanente Attn: Deniene Erickson, Issues Manager deniene.x.erickson@kp.org	Kaiser Permanente Attn: Linda Krystof linda.krystof@kp.org	Kaiser Permanente Facility, Walnut Creek 1425 S Main St Walnut Creek, CA 94596

6.10 SMALL BUSINESSES

Econo Storage 375 Arthur Rd Martinez, CA 94553	UCI Construction Inc 261 Arthur Rd Martinez, CA 94553	Myrant Glass Co 187 Arthur Rd B Martinez, CA 94553
Farrington Kennels 170 Nardi Lane Martinez, CA 94553	Blum Road Storage Center 4450 Blum Rd Martinez, CA 94553	Buchanan Fields Golf Club 1091 Concord Ave Concord, CA 94520
International Food Market 1106 Meadow Ln Concord, CA 94520	Mercado del Valle 1651 Monument Blvd Concord, CA 94520	Los Rancheros Supermarket 1099 Reganti Dr, A Concord, CA 94518
Tacos El Patron 2290 Monument Blvd Pleasant Hill, CA 94523	Back Forty Texas BBQ 100 Coggins Dr Pleasant Hill, CA 94523	Pho Huynh Hiep 6 – Kevin's Noodle House 2034 N Main St Walnut Creek, CA 94506
Lettuce Restaurant & Catering 1632 Locust St Walnut Creek, CA 94596	Teleferic Barcelona 1500 Mt Diablo Blvd Walnut Creek, CA 94596	Lavoro Laser 43 Quail Ct, Unit 107 Walnut Creek, CA 94596
Elks Lodge 1475 Creekside Dr Walnut Creek, CA 94596	Marta's Flowers 11 Rudgear Dr Walnut Creek, CA 94596	-

6.11 BUSINESS ORGANIZATIONS

Walnut Creek Chamber of Commerce & Visitors Bureau Attn: Audrey Gee, Chair of the Board 1280 Civic Drive, Suite 100 Walnut Creek, CA 94596	Concord Chamber of Commerce Attn: Jennifer Jimenez, Chair of the Board 2280 Diamond Blvd. #200 Concord, CA 94520	Martinez Chamber of Commerce Attn: Adam Hoffert, Chair of the Board 603 Marina Vista Martinez, CA 94553

Contra Costa Small Business Development Center Attn: Al Gohary, Director 1 Harpst St, House 71 Arcata, CA 95521 East Bay Small Business Development Center 25800 Carlos Bee Boulevard, VBT 346, Hayward, CA 94542	East Bay Works 4071 Port Chicago Hwy, Suite 250 Concord, CA 94520	Women's Business Center Attn: Aldo Reyes, Manager (East Bay) areyes@anewamerica.org 1470 Fruitvale Avenue, Suite 5, Oakland, CA 94601
Law Offices of Jason A Bezis Attn: Jason A. Bezis 3661-B Mosswood Drive Lafayette, CA 94549	-	-

6.12 RESIDENTIAL ORGANIZATIONS

Del Rio Homeowners' Association 1428 Del Rio Circle Concord, CA 94518	The Keys Condominium Owners Association Attn: Delaina Horner, Assistant General Manager 312 N Civic Dr Walnut Creek, CA 94596	Walnut Country Crossings Homeowners' Association Attn: Mike Kindorf, President 4498 Lawson Court Concord, CA 94521
Countrywood Homeowners Association 1706 Countrywood Court Walnut Creek, CA 94598-1012	-	-

6.13 FAITH BASED GROUPS

Landmark Missionary Baptist Church 391 Arthur Blvd Martinez, CA 94553	First Light Christian Center 4769 Pacheco Blvd Martinez, CA 94553	Iglesia Fuente de Salvacion 1628 Broadway Avenue San Pablo, CA 94806
Interfaith Council of Contra Costa Attn: Charlotte Gin, Office Manager 404 Gregory Lane Pleasant Hill, CA 94523	-	-

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