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

The chapter discusses potential environmental impacts of the Yolo 80 Corridor Improvements Project (project) and recommended avoidance and minimization measures (AMMs), and mitigation measures (MMs). The proposed AMMs and MMs are also summarized in Appendix C. A list of references is available in Appendix D, a list of Standard Measures is included in Appendix E, a list of abbreviations used in this document is available in Appendix F, and the list of technical studies prepared for this project is available in Appendix H. This chapter also addresses issues of concern pursuant to the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). Please see Chapter 3 for the CEQA analysis.

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 the following issues in this document.

- **Coastal Zone** – The project is not located within the California Coastal Zone. As such, no coastal resources would be affected by construction or operation of the project.
- **Timberlands** – The project area is not located near timberlands. Therefore, the project would not convert timberlands to a non-timberland use or otherwise affect timberlands.
- **Wild and Scenic Rivers** – The project area does not traverse any rivers designated as part of the National Wild and Scenic Rivers System. As such, no wild or scenic rivers would be affected by construction or operation of the project.
- **Relocations and Real Property Acquisition –** The project would be constructed primarily within the existing Caltrans right-of-way. No property acquisitions are needed, and no residents or businesses would be relocated.

2.1 Human Environment

2.1.1 Existing and Future Land Use

Information in this section is based on the Community Impact Assessment (CIA) prepared for the project (Caltrans 2023a).

The project is in Solano, Yolo, and Sacramento counties on the I-80/US-50 corridor, with a total project length of approximately 20.8 miles. To evaluate effects on land use, the Land Use Study Area is defined as the physical areas directly surrounding I-80/US-50 in the project area that have the potential to experience direct effects associated with the project. The Land Use Study

Area includes the project area, plus a 1,000-foot buffer. The Land Use Study Area includes the population most likely to experience direct effects associated with the project's direct physical improvements.

2.1.1.1 Affected Environment

The Land Use Study Area extends through multiple jurisdictions; therefore, there are various plans that guide development, land use, and transportation policies within the Land Use Study Area. Figure 2.1-1 shows designated land uses within the Land Use Study Area.

The western segment of the Land Use Study Area is located within unincorporated Solano County and is surrounded by agricultural and commercial land use designations. These agricultural areas are also mapped by Solano County with an Agricultural Reserve Overlay.

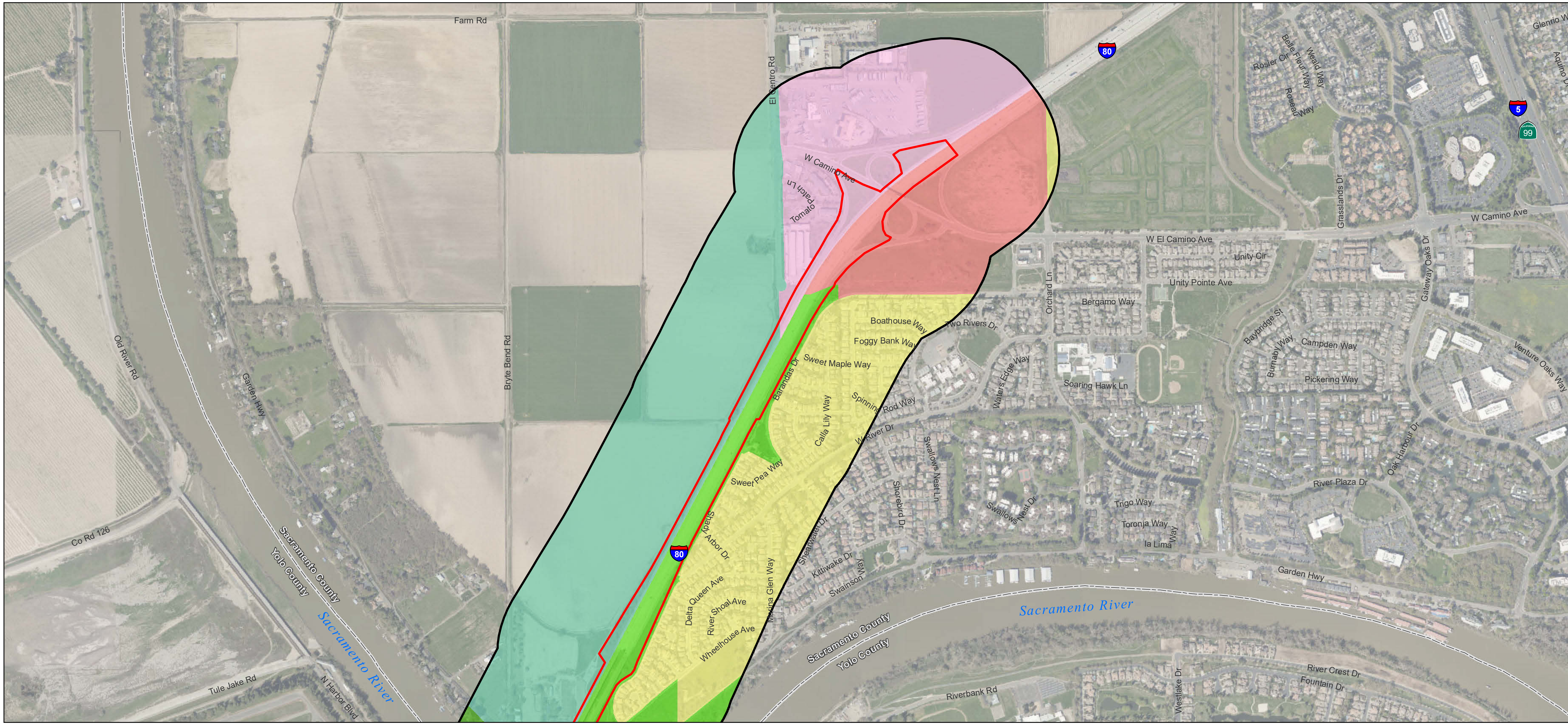
Once I-80 crosses into Yolo County, it is surrounded by the UC Davis campus, with land uses designated as public/quasi-public and agriculture. East of UC Davis, the Land Use Study Area passes through a mix of residential, industrial, open space, parks and recreation, mixed use, and commercial land uses in the city of Davis. It also passes through the City of Davis' Gateway Olive Drive Specific Plan (City of Davis 2018), which guides development in a 165-acre area north of I-80 near the Richards Boulevard Interchange.

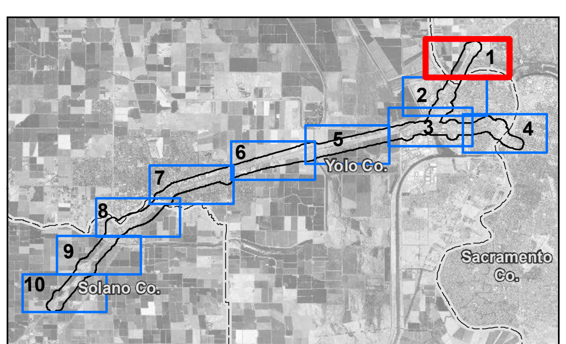
East of the city of Davis, I-80 crosses the Yolo Causeway and links the cities of Davis and West Sacramento across the Yolo Bypass floodway. These portions of the Land Use Study Area are designated by Yolo County as agriculture and open space.

In West Sacramento, I-80 passes through mostly commercial and industrial land uses, with some residential and public/quasi-public areas. After I-80 crosses the Sacramento River, the northeastern portion of the Land Use Study Area includes agricultural land uses within unincorporated Sacramento County, and residential, mixed use, and commercial areas within the city of Sacramento.

East of Harbor Boulevard, US-50 passes through residential, commercial, and mixed-use areas in the city of West Sacramento, including the Bridge District Specific Plan area, which provides the framework for mixed-use urban redevelopment areas along the Sacramento River. After crossing the Pioneer Bridge over the Sacramento River, US-50 enters the city of Sacramento, with land uses designated as parks and recreation, commercial/employment, public/quasi-public, and residential.

In addition to existing land uses, there are projects and developments within the existing and future I-80/US-50 travelshed and a large geographic catchment. The baseline transportation and development improvement projects that are planned and proposed for locations within the project area are listed in Chapter 1.





Land Use Study Area
ESL
County Line

Land Use

- Agriculture
- Commercial/Employment
- Industrial
- Mixed Use
- Open Space
- Parks and Recreation
- Public/Quasi-Public
- Residential - Low Density
- Residential - Medium Density
- Residential - High Density

0 2,000
Feet

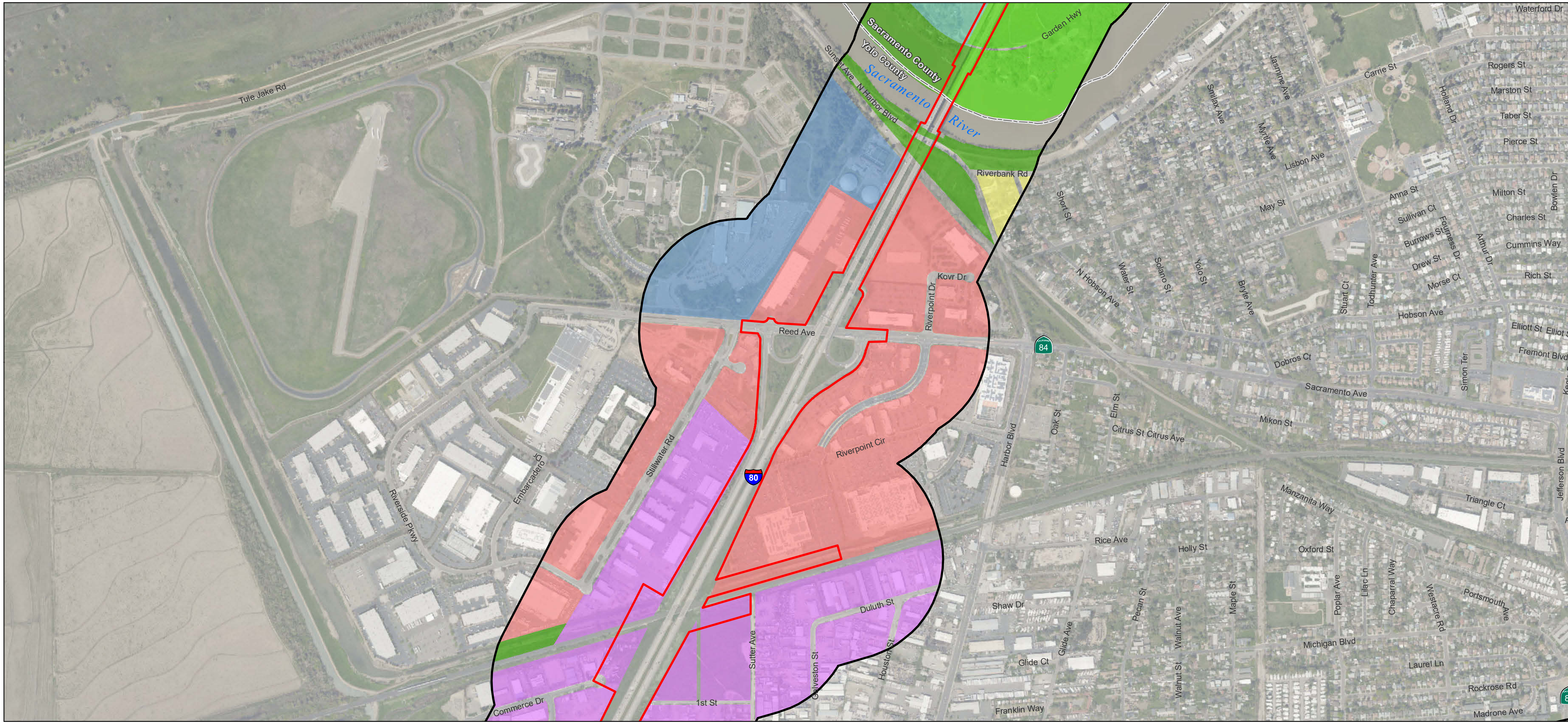
N

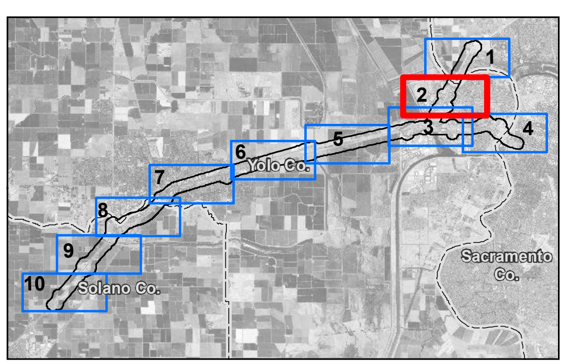
Caltrans

Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2021
3. Background: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\Figures\Fig_2.1-1_LandUse.mxd Revised: 2021-10-21 By: pglendening

Figure 2.1-1
Land Uses in the Land Use Study Area
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California





Land Use Study Area
ESL
County Line

Land Use

- Agriculture
- Commercial/Employment
- Industrial
- Mixed Use
- Open Space
- Parks and Recreation
- Public/Quasi-Public
- Residential - Low Density
- Residential - Medium Density
- Residential - High Density

N

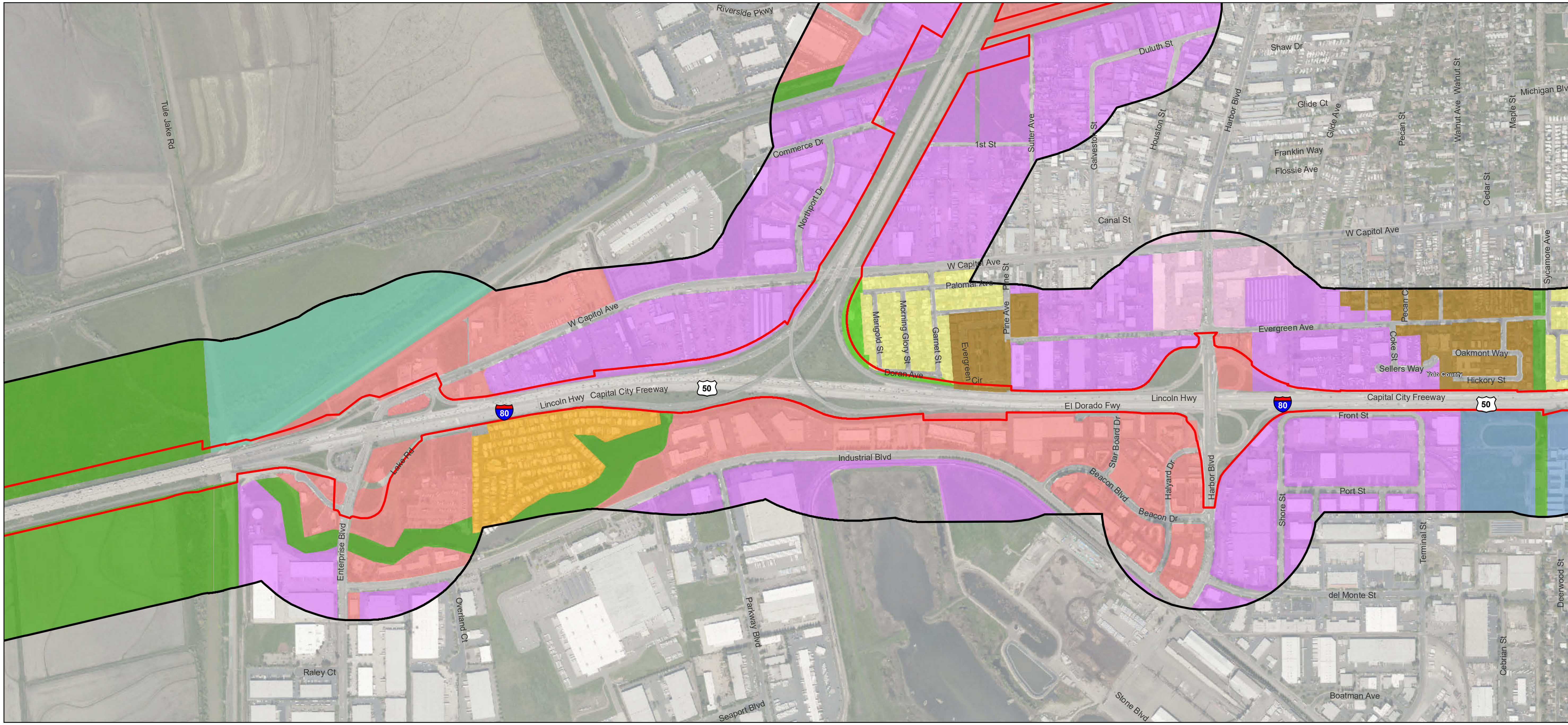
0 2,000
Feet

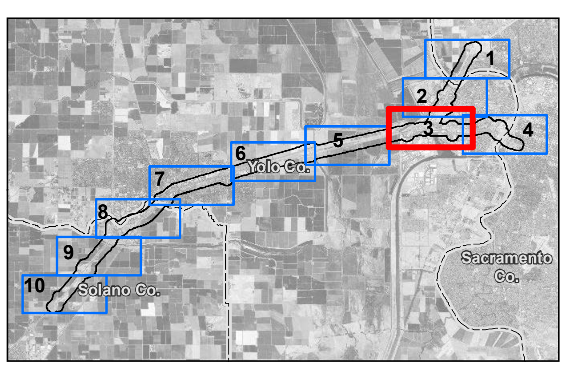
Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2021
3. Background: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Caltrans

Figure 2.1-1
Land Uses in the Land Use Study Area
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\Figures\Fig_2.1-1_LandUse.mxd Revised: 2021-10-21 By: pglendening





Land Use Study Area
ESL

Land Use
- Agriculture
- Commercial/Employment
- Industrial
- Mixed Use
- Open Space
- Parks and Recreation
- Public/Quasi-Public
- Residential - Low Density
- Residential - Medium Density
- Residential - High Density

N

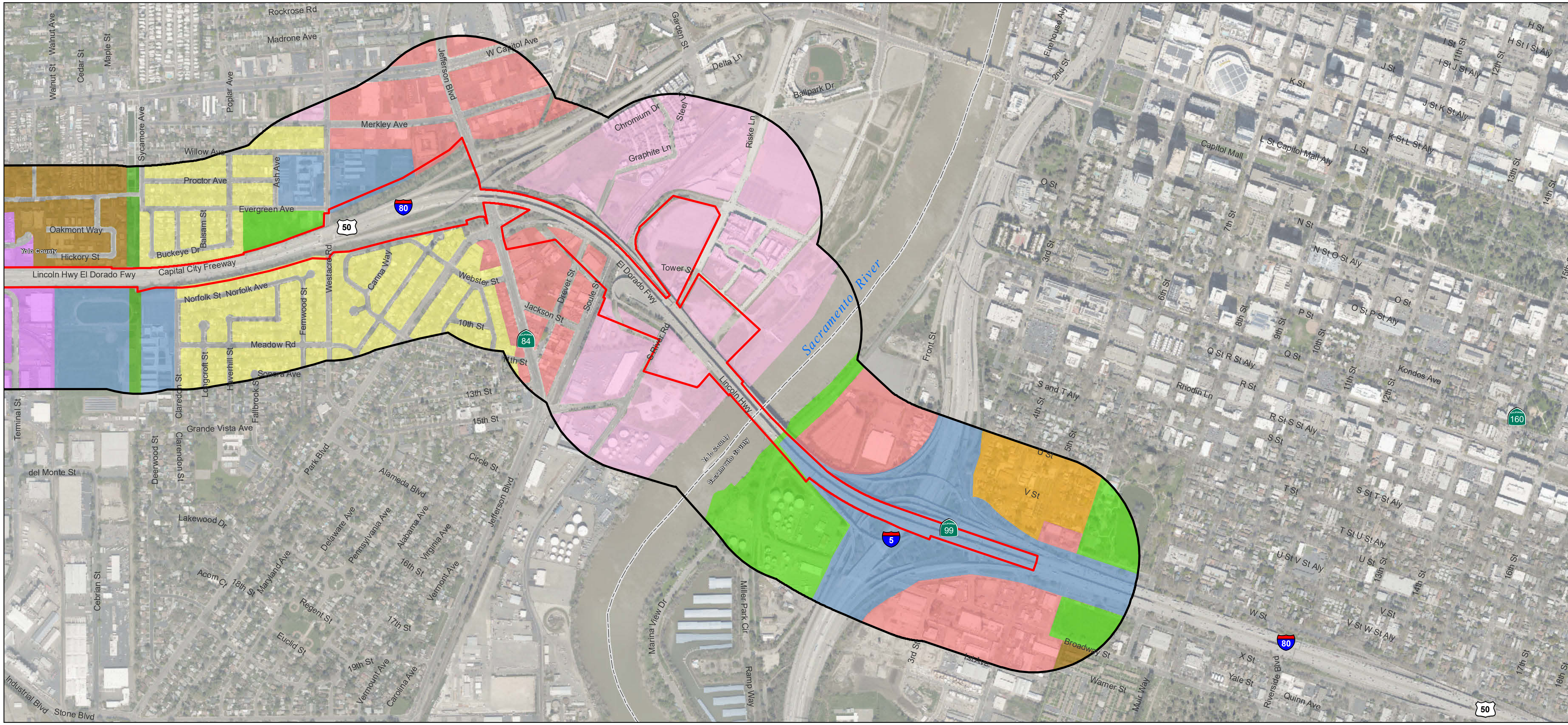
0 2,000
Feet

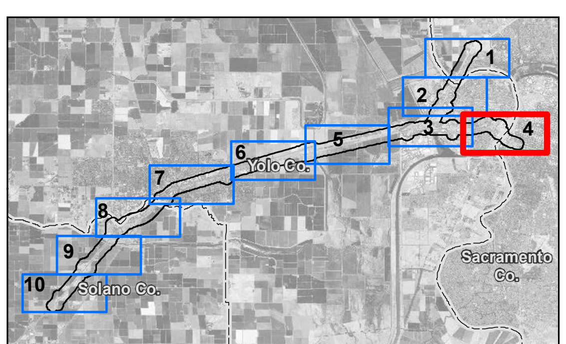
Caltrans

Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2021
3. Background: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\Figures\Fig_2.1-1_LandUse.mxd Revised: 2021-10-21 By: pglendening

Figure 2.1-1
Land Uses in the Land Use Study Area
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California





Land Use Study Area
ESL
County Line

Land Use

- Agriculture
- Commercial/Employment
- Industrial
- Mixed Use
- Open Space
- Parks and Recreation
- Public/Quasi-Public
- Residential - Low Density
- Residential - Medium Density
- Residential - High Density

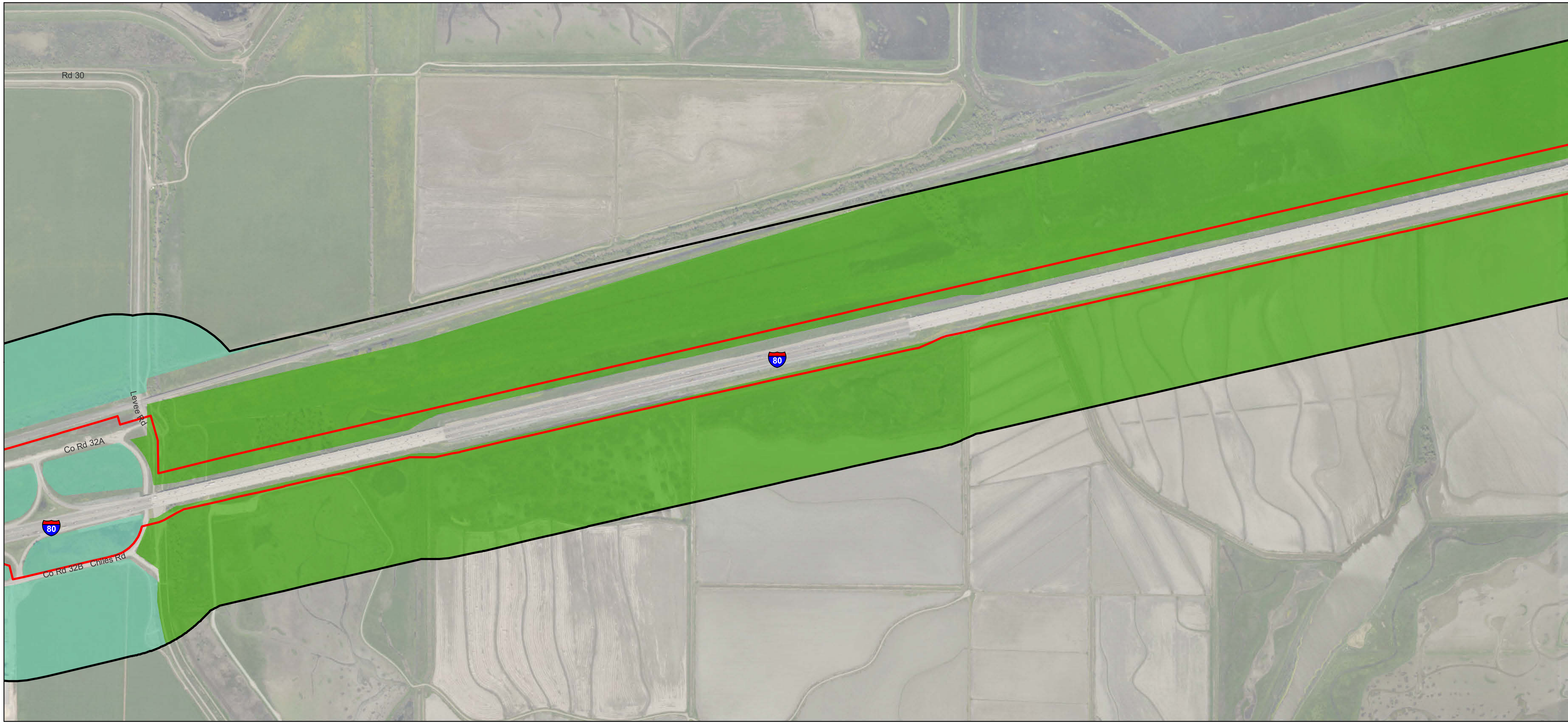
0 2,000
Feet
N

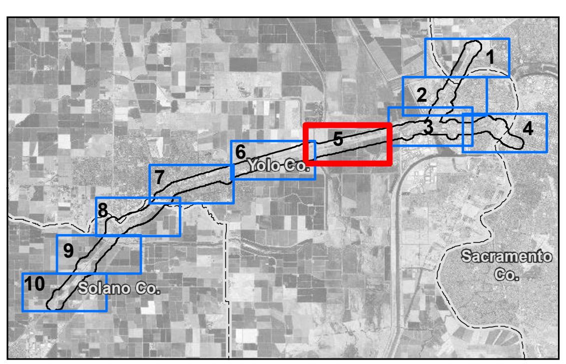
Caltrans

Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2021
3. Background: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Figure 2.1-1
Land Uses in the Land Use Study Area
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\Figures\Fig_2.1-1_LandUse.mxd Revised: 2021-10-21 By: pglendening





Land Use Study Area
ESL

Land Use
- Agriculture
- Commercial/Employment
- Industrial
- Mixed Use
- Open Space
- Parks and Recreation
- Public/Quasi-Public
- Residential - Low Density
- Residential - Medium Density
- Residential - High Density

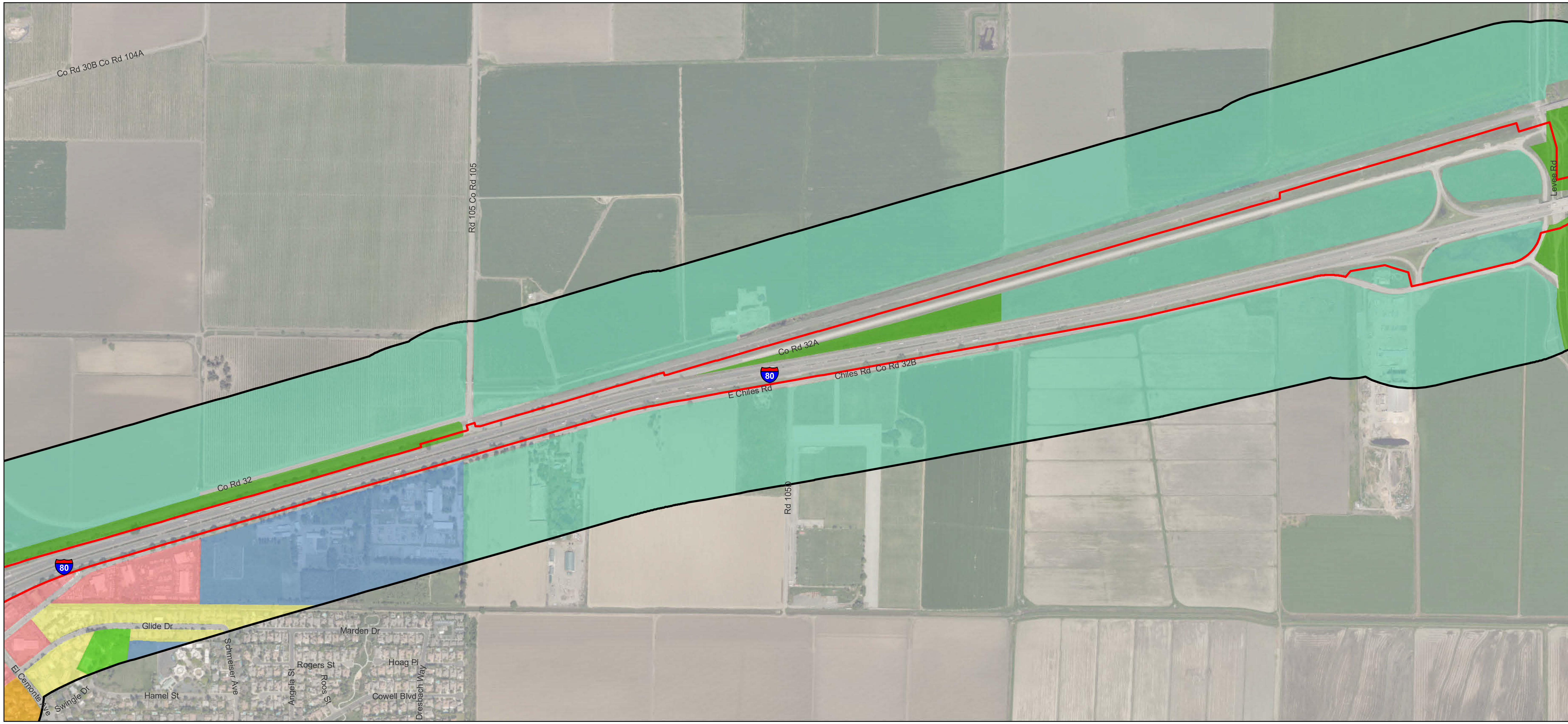
N
0 2,000
Feet

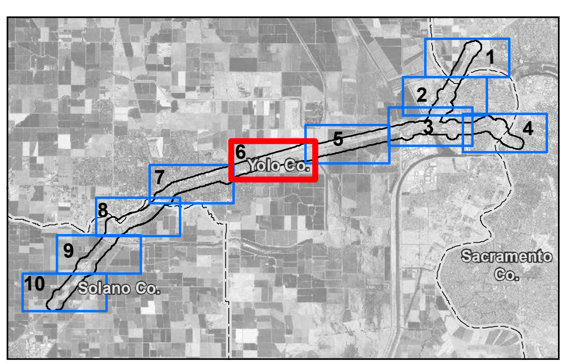
Caltrans

Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2021
3. Background: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Figure 2.1-1
Land Uses in the Land Use Study Area
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\Figures\Fig_2.1-1_LandUse.mxd Revised: 2021-10-21 By: pglendening





Land Use Study Area
ESL

Land Use

- Agriculture
- Commercial/Employment
- Industrial
- Mixed Use
- Open Space
- Parks and Recreation
- Public/Quasi-Public
- Residential - Low Density
- Residential - Medium Density
- Residential - High Density

N

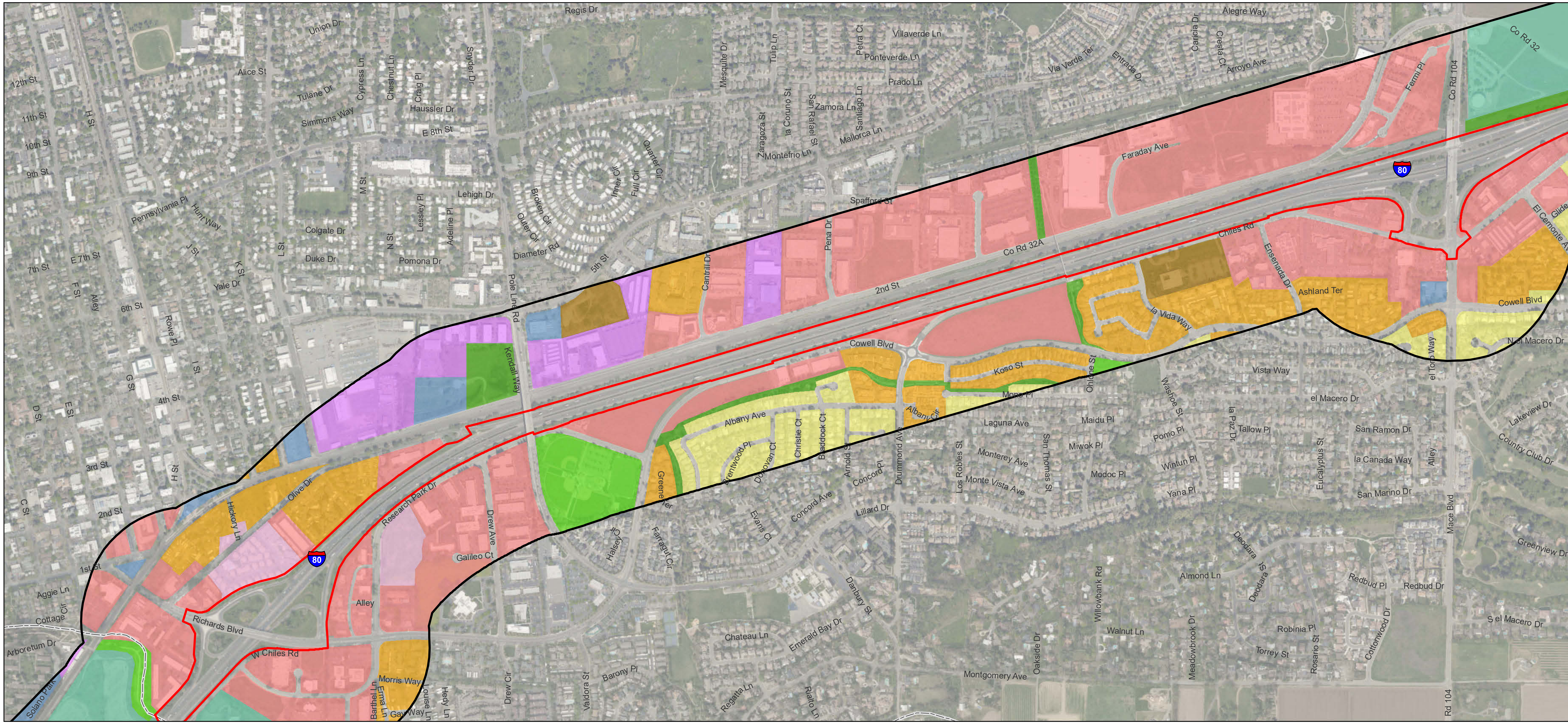
0 2,000
Feet

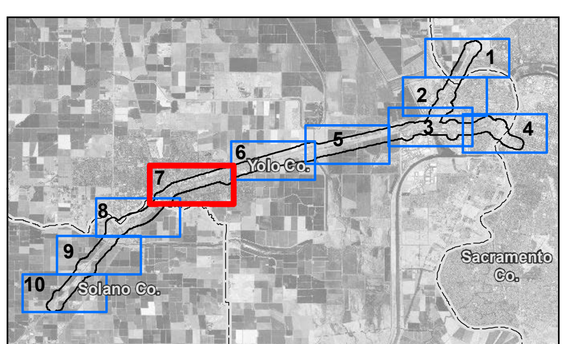
Caltrans

Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2021
3. Background: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Figure 2.1-1
Land Uses in the Land Use Study Area
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\Figures\Fig_2.1-1_LandUse.mxd Revised: 2021-10-21 By: pglendening





Land Use Study Area
ESL
County Line

Land Use

- Agriculture
- Commercial/Employment
- Industrial
- Mixed Use
- Open Space
- Parks and Recreation
- Public/Quasi-Public
- Residential - Low Density
- Residential - Medium Density
- Residential - High Density

N

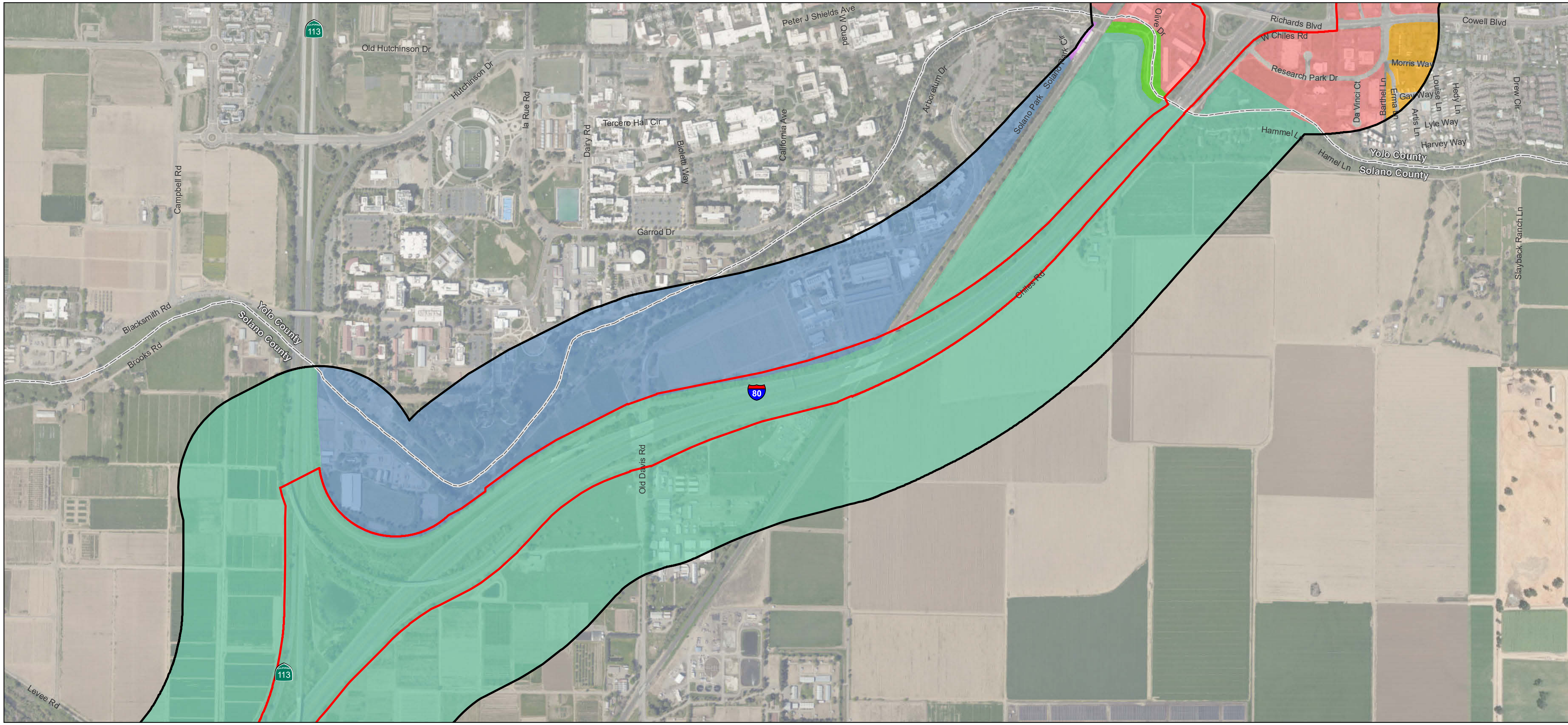
0 2,000
Feet

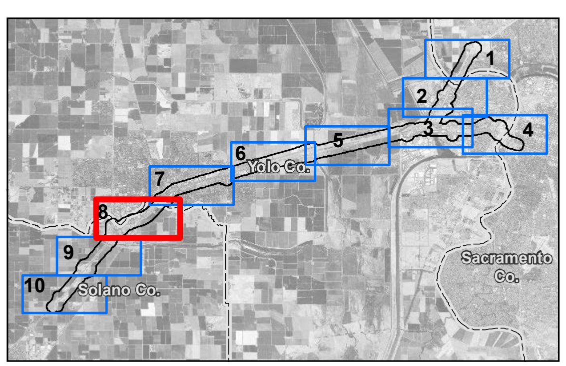
Caltrans

Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2021
3. Background: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Figure 2.1-1
Land Uses in the Land Use Study Area
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\Figures\Fig_2.1-1_LandUse.mxd Revised: 2021-10-21 By: pglendening





Land Use Study Area
ESL
County Line

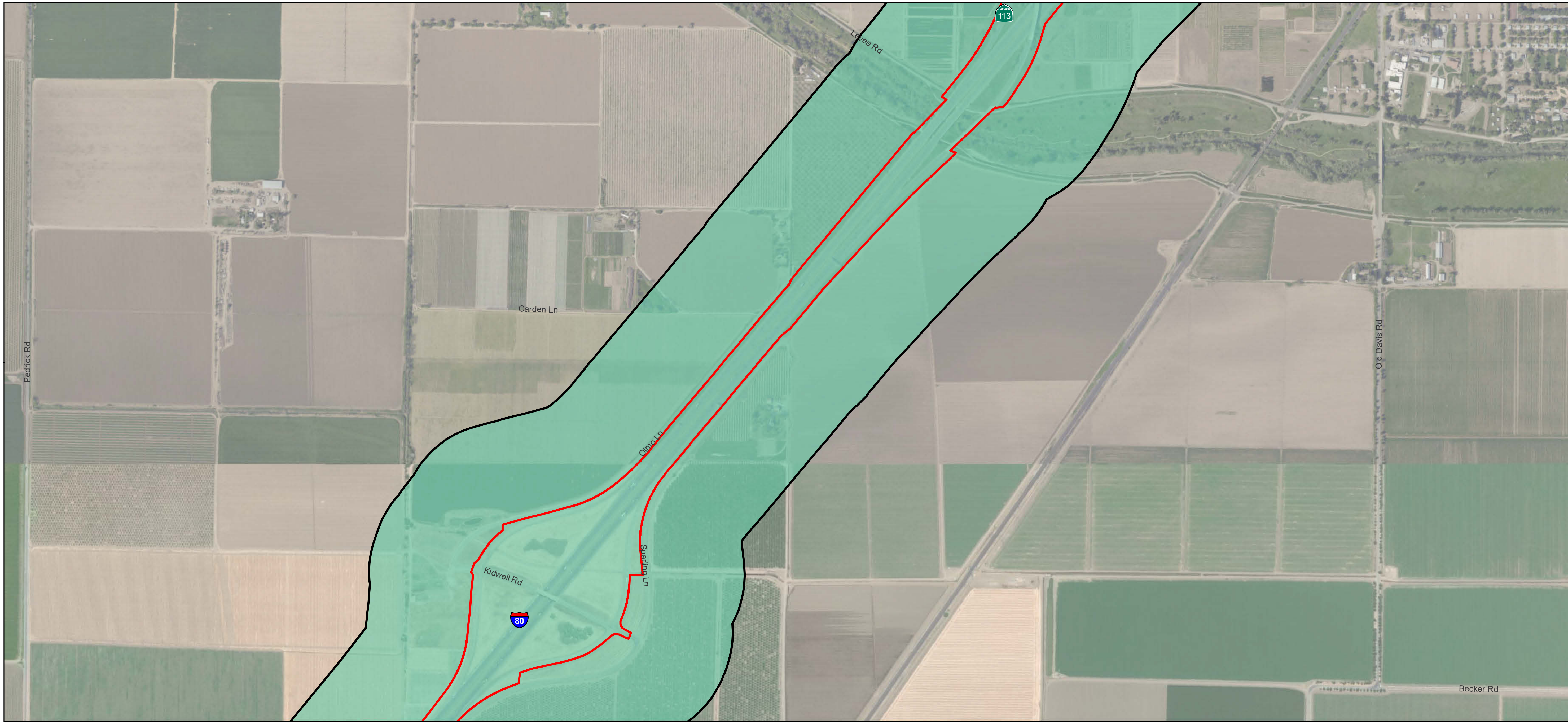
Land Use

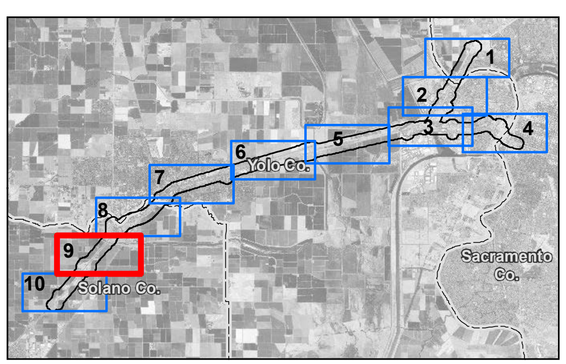
- Agriculture
- Commercial/Employment
- Industrial
- Mixed Use
- Open Space
- Parks and Recreation
- Public/Quasi-Public
- Residential - Low Density
- Residential - Medium Density
- Residential - High Density

0 2,000
Feet

Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2021
3. Background: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Figure 2.1-1
Land Uses in the Land Use Study Area
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California





Land Use Study Area
ESL

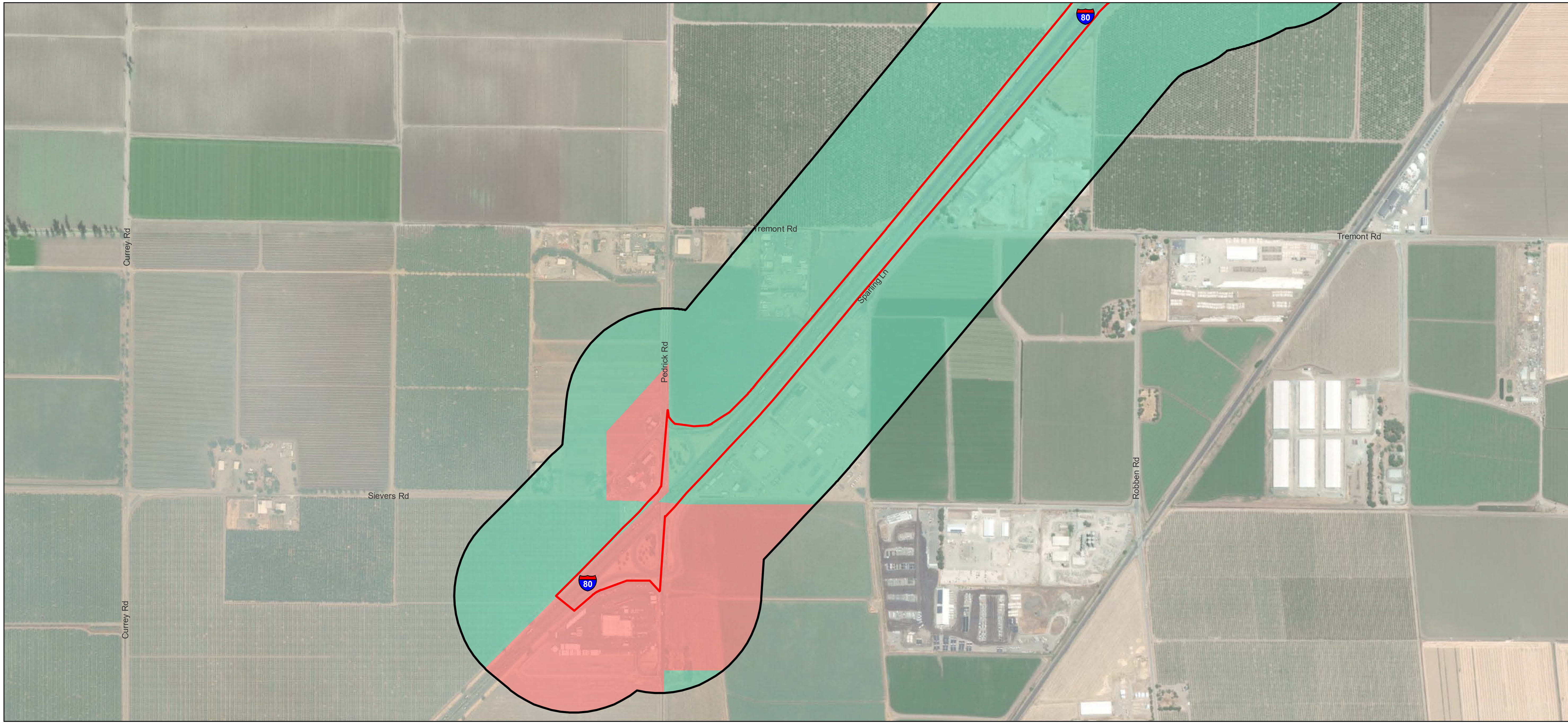
Land Use
- Agriculture
- Commercial/Employment
- Industrial
- Mixed Use
- Open Space
- Parks and Recreation
- Public/Quasi-Public
- Residential - Low Density
- Residential - Medium Density
- Residential - High Density

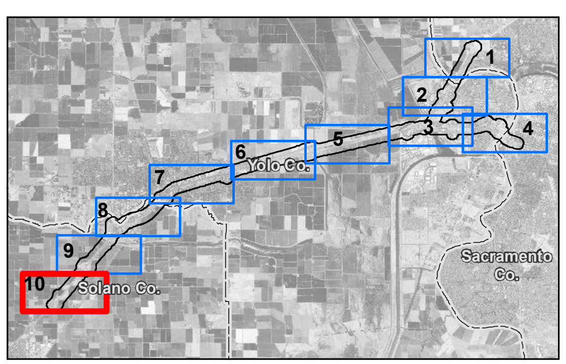
N
0 2,000
Feet

Caltrans

Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2021
3. Background: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Figure 2.1-1
Land Uses in the Land Use Study Area
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California





Land Use Study Area
ESL

Land Use

- Agriculture
- Commercial/Employment
- Industrial
- Mixed Use
- Open Space
- Parks and Recreation
- Public/Quasi-Public
- Residential - Low Density
- Residential - Medium Density
- Residential - High Density

N

0 2,000
Feet

Caltrans

Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2021
3. Background: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Figure 2.1-1
Land Uses in the Land Use Study Area
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\Figures\Fig_2.1-1_LandUse.mxd Revised: 2021-10-21 By: pglendening

2.1.1.2 Environmental Consequences

Indirect changes to land use can include changes in development patterns, rates, and densities, which may be influenced by changes in traffic patterns and highway capacity. The rate and location of regional growth and land use change can be influenced by travel time and travel cost for residents and workers. Improvements in access, traffic conditions, and lower travel costs can influence the attractiveness of some areas over others for future development.

As mentioned in the Fehr and Peers Technical Memo from May 2023, the methodology utilized for calculating VMT reduction for each mitigation measure is based on modeling techniques using two different modeling strategies. The modeling strategies (SACSIM and TDM+) put forth each mitigation measure for analysis on VMT effects. As each mitigation measure was analyzed with a modeling tool, each output was then put towards equations from the California Air Pollution Control Officers Association (CAPCOA) 2021 to calculate VMT reduction. Each mitigation measure's VMT reduction is calculated and listed in the Technical Memo, as well as the VMT Mitigation Plan. Further, each mitigation measure was either part of SACOG's MTP/SCS or its own environmental review analysis. SACOG's MTP/SCS has a completed Environmental Impact Report, which incapsulates each project in the mitigation plan that is associated with the MTP/SCS.

The addition of three roundtrip train services on the Capitol Corridor route from Oakland to Sacramento would reduce VMT, as mentioned in the attached VMT Mitigation Plan. The calculations and basis for the VMT reduction is based on a Traffic Congestion Relief Program (TCRP) equation, that utilizes a direct effect and indirect effect of train services. In this case, the three additional roundtrips saves 6.3 million passenger miles, which is then multiplied by 2 to obtain the VMT reduction. Hence, the VMT reduction number of 12.6 million is shown in the VMT Mitigation Plan.

No Build Alternative 1

Construction and Operation

Under No Build Alternative 1, managed lanes and transportation improvements would not be constructed or operated. Therefore, the overall number of lanes in the project area would not change. As such, the No Build Alternative 1, would have no effect on existing and future land uses.

Build Alternatives 2a and 2b

Construction

Build Alternatives 2a and 2b would involve adding an HOV 2+ lane in each direction. Build Alternatives 2a and 2b would replace existing inside shoulders, construct a new median, construct pedestrian/bicycle improvements, install ITS elements, and other improvements. Build Alternative 2b would also install an I-80 connector structure. Most of the project work would occur entirely within the existing Caltrans right-of-way; however, construction would require a temporary construction easement (TCE) and some staging areas located outside the Caltrans right-of-way. The TCE would be required to accommodate construction activities; however, such activities would not result in conversion of existing land uses adjacent to the project. No impact on existing or future land uses would occur. Therefore, Build Alternatives 2a and 2b would have no effect on existing and future land uses during construction. However, there will be impacts to Vehicle Miles Traveled (VMT), where the build alternatives will induce VMT through the project scope. As part of mitigation, the project will reduce VMT through VMT mitigation efforts.

As mentioned in the Fehr and Peers Technical Memo from May 2023, the methodology utilized for calculating VMT reduction for each mitigation measure is based on modeling techniques using two different modeling strategies. The modeling strategies (SACSIM and TDM+) put forth each mitigation measure for analysis on VMT effects. As each mitigation measure was analyzed with a modeling tool, each output was then put towards equations from the California Air Pollution Control Officers Association (CAPCOA) 2021 to calculate VMT reduction. Each mitigation measure's VMT reduction is calculated and listed in the Technical Memo, as well as the VMT Mitigation Plan. Further, each mitigation measure was either part of SACOG's MTP/SCS or its own environmental review analysis. SACOG's MTP/SCS has a completed Environmental Impact Report, which incapsulates each project in the mitigation plan that is associated with the MTP/SCS.

The addition of three roundtrip train services on the Capitol Corridor route from Oakland to Sacramento would also reduce VMT, as mentioned in the attached VMT Mitigation Plan. The calculations and basis for the VMT reduction is based on a Traffic Congestion Relief Program (TCRP) equation, that utilizes a direct effect and indirect effect of train services. In this case, the three additional roundtrips save 6.3 million passenger miles, which is then multiplied by 2 to obtain the VMT reduction. Hence, the VMT reduction number of 12.6 million is shown in the VMT Mitigation Plan.

Operation

Build Alternatives 2a and 2b would involve acquisition of one permanent right-of-way easement for the proposed park-and-ride facility. No displacement of residences or businesses would be required.

By increasing freeway capacity and reducing travel costs, Build Alternatives 2a and 2b could change the rate of development expected compared to the No-Build condition. Since I-80 is a key link between the Sacramento and Bay Area, and homes in the Sacramento area are typically more affordable than homes in the Bay Area, the improved travel times on I-80 in the Project corridor could influence more Bay Area residents to move east to the Sacramento area and commute to job centers. However, other bottlenecks on I-80 and other highways into the Bay Area west of the Project (e.g., I-680, I-580, I-880, SR-37, SR-4) may deter commuters from Sacramento and outlying areas to the Bay Area. Within the Community Study Area, planned development at UC Davis and West Sacramento may benefit from the transportation improvement provided under the project, making these areas more attractive and changing the rate at which planned development would occur along the corridor. Improving travel times and capacity along I-80 is not expected to stimulate growth into areas where development is not planned, as other impediments to growth (e.g., floodplain conditions, long-term wildlife refuge and agricultural preserves, and built-out conditions in city limits), market conditions, and local land use policies are a greater influence on land use change than roadway capacity.

The proposed Park-and-Ride Facility with approximately 300 parking spaces would be located on the east side of Enterprise Boulevard. The facility would total 4.5 acres, located partially within existing Caltrans right-of-way and partially outside the existing Caltrans right-of-way, requiring 2.8 acres of additional permanent easement acquisition. This additional right-of-way would be within an undeveloped area designated by the City of West Sacramento as "Highway-Service Commercial" land use, which provides for restaurants, service stations, hotels and motels, and other retail uses oriented principally to highway and through traffic, public and quasi-public uses, and similar and compatible uses (City of West Sacramento 2016). The construction of a park-and-ride facility is compatible with this land-use designation.

Furthermore, Build Alternatives 2a and 2b propose an extension of the Yolo Causeway Class I bicycle path along Levee Road (option A) or along the westbound off-ramp alignment (option B) to connect with County Road (CR-) 32A. This work would be completed in coordination with Yolo County, would be entirely within the Yolo County right-of-way, and would be performed through an encroachment permit acquired by Caltrans from Yolo County. Therefore, operation of Build Alternatives 2a and 2b would have no effect on existing and future land uses.

Build Alternatives 3a and 3b

Construction and Operation

Build Alternatives 3a and 3b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 4a and 4b

Construction and Operation

Build Alternatives 4a and 4b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 5a and 5b

Construction and Operation

Build Alternatives 5a and 5b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 6a and 6b

Construction and Operation

Build Alternatives 6a and 6b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 7a and 7b

Construction and Operation

Build Alternatives 7a and 7b would involve repurposing the current number 1 general purpose lane to HOV 2+. No new lanes would be constructed. Build Alternatives 7a and 7b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

2.1.1.3 Avoidance, Minimization, and/or Mitigation Measures

No AMMs or MMs are required.

2.1.2 Consistency with Regional, and Local Plans and Programs

2.1.2.1 Affected Environment

This section identifies state, regional, and local plans and programs, and describes how the project would be consistent with or conform to relevant plan and program elements (Table 2.1-1).

The segments of the I-80/US-50 corridor in the project area extend through multiple jurisdictions and are subject to the policies of several plans and programs that guide development and transportation policies within the Land Use Study Area. Regional and local plans discussed below include the SACOG Metropolitan Transportation Plan (MTP)/Sustainable Communities Strategy (SCS), the Solano County General Plan, City of Davis General Plan, Yolo County Revised Draft 2030 Countywide General Plan, City of West Sacramento General Plan, City of Sacramento 2035 General Plan, and Sacramento County 2030 General Plan.

Sacramento Area Council of Governments (SACOG) 2020 Metropolitan Transportation Plan (MTP)/Sustainable Communities Strategy (SCS)

The 2020 MTP/SCS prepared by SACOG serves as a transportation and land use strategy for the SACOG Planning Area. The overall focus for the 2020 update is to develop strategies to support access to jobs and economic opportunity, transportation options, and affordable housing in a manner that improves air quality, preserves open space, and reduces greenhouse gas (GHG) emissions. SACOG is looking at Caltrans-managed lane projects to lead efforts at transportation revenue and pricing. SACOG sees pricing mechanisms as a critical component of the regional strategy to raise revenue sufficient to build and maintain the region’s transportation system, provide mobility benefits to residents, manage traffic and congestion, and help to achieve the state-mandated GHG reduction targets (Caltrans 2023a).

Solano County General Plan

A small part of the project area is located within unincorporated Solano County, largely within an area characterized by agricultural land use. The Transportation and Circulation chapter of the Solano County General Plan (Solano County 2008) sets forth the policy framework to shape circulation within Solano County.

The Solano County portion of the project is located within the Solano County Metropolitan Transportation Commission (MTC) area. The 2017 Solano County Regional Transportation Plan (RTP) does not include managed lanes between the Kidwell Road interchange and the Yolo County line. Although the Solano County portion of work for this project is not currently included in MTC’s recently initiated RTP update, Caltrans District 4 will discuss this portion of work with the Solano County Transportation Authority. The project’s scope of work for tolling facilities within Solano County is limited to advance warning signs, rather than any actual tolling facilities. The only tolling facility relations between this project and Solano County/District 4 would be if District 4 initiated its own tolling/managed lanes project from the end of the Yolo Bypass project’s limits further into Solano County on I-80. Accordingly, Caltrans will continue to coordinate with Caltrans District 4, Solano County MTC, and Solano County Transportation Authority to include the Solano County portion of the project in their RTP update.

City of Davis General Plan

The City of Davis General Plan (Amended 2007) includes a transportation element that establishes goals, performance objectives, and policies to guide the evolution and development of the Davis transportation system to year 2035.

University of California, Davis 2018 Long-Range Development Plan

The UC Davis LRDP (2018) provides the growth policies for the main Davis campus and Russell Ranch research lands, totaling about 5,300 acres in Yolo and Solano counties.

Yolo County Revised Draft 2030 Countywide General Plan

Yolo County’s Revised Draft 2030 Countywide General Plan (Yolo County 2009) determines land use planning throughout the unincorporated portions of the county and includes a circulation element that focuses on mobility and is correlated with the land uses in the Yolo County General Plan Land Use Element. The goals and policies emphasize multiple modes of travel and encourage non-vehicular trips.

City of West Sacramento General Plan

In 2016, the City of West Sacramento approved their General Plan 2035, which guides how the city should develop over time; specifies locations for various land uses, transportation improvements, new parks and open spaces, and other public infrastructure; and includes a

Mobility Element containing policies for developing a connected, efficient, multi-modal system (City of West Sacramento 2016).

City of Sacramento 2035 General Plan

The City of Sacramento 2035 General Plan identifies the vision, themes, and organization of the City of Sacramento. The Plan's goals, policies, and implementation programs are meant to provide a guide for future development and preservation of resources. Part 2 of the General Plan, *Citywide Goals and Policies*, includes a Mobility Element that describes Sacramento's goals and policies related to transportation.

The City of Sacramento is updating its general plan and anticipates adopting the 2040 General Plan in 2023. On January 19, 2021, the 2040 General Plan Draft Land Use Map, proposed roadway changes, and other key strategies were presented to the Sacramento City Council. The key strategies include substantial policy changes, including permitting a greater variety of housing types in single-unit neighborhoods, such as duplexes, triplexes, and fourplexes. These new policies may allow for greater density development in traditionally single-family residential neighborhoods (City of Sacramento 2022a). The goals and policies for the draft 2040 General Plan are still under review by the community through August 2023 and would be adopted in early 2024, so they are not presented in this consistency evaluation. Nevertheless, the proposed Build Alternatives would not conflict with the new housing and climate change policies proposed in the 2040 General Plan draft.

Sacramento County 2030 General Plan

The Sacramento County 2030 General Plan serves as a guide for growth and development within unincorporated Sacramento County. The plan focuses on economic growth and environmental sustainability, addressing the issues and needs of existing communities and establishing a framework for accommodating the growth of new communities. The Sacramento County General Plan includes a new growth management strategy, a stronger focus on addressing existing communities and revitalizing aging commercial corridors, a new economic development element, and strategies to reduce GHG emissions consistent with state law.

The Circulation Element of the Sacramento County General Plan was amended on October 6, 2020. Sacramento County supports the development of a regional network of Bus/Carpool lanes, including along I-80 and US-50 in the project area.

Table 2.1-1. Consistency with State, Regional and Local Plans and Programs

Policy	No Build Alternative 1	Build Alternatives 2a and 2b	Build Alternatives 3a and 3b	Build Alternatives 4a and 4b	Build Alternatives 5a and 5b	Build Alternatives 6a and 6b	Build Alternatives 7a and 7b
Sacramento Area Council of Governments Metropolitan Transportation Plan/Sustainable Communities Strategy							
Policy 12: Take steps to implement tolling or pricing of specific lanes on major facilities, such as freeways, to improve traffic management, reliability, and operations of those facilities and to help raise funding for the cost of building and maintaining large capital investments.	**Inconsistent.** The No Build Alternative does not involve tolling or pricing strategies.	**Partially Consistent**. Although Build Alternatives 2a and 2b would not implement tolling or pricing strategies, they would take steps to allow future tolling or pricing.	**Consistent.** Build Alternatives 3a and 3b would implement tolling or pricing strategies.	**Consistent.** Same as Build Alternatives 3a and 3b, respectively.	**Consistent.** Same as Build Alternatives 3a and 3b, respectively.	**Partially Consistent.** Build Alternatives 6a and 6b would not include tolling or pricing strategies. Further, due to underuse of the proposed transit lane, these alternatives would not improve traffic operations in the project corridor compared to the No-Build Alternative 1.	**Partially Consistent.** Build Alternatives 7a and 7b would not include tolling or pricing strategies. Further, due to lanes repurposed for HOVs, these alternatives would not improve traffic operations in the project corridor compared to the No-Build Alternative1.
Policy 13: All new major expansion projects on the region's freeways and expressways should be planned for eventual deployment of pricing options to both manage demand and provide a financing mechanism for capital costs. Any pricing strategy pursued should be sensitive to changes in roadway demand during different parts of the day (peak/off-peak) with the objective of managing demand and providing travel choice.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Partially Consistent**. Although Build Alternatives 2a and 2b would not implement tolling or pricing strategies, they would take steps to allow future tolling or pricing. Managed lanes would be operational during peak demand periods only.	**Consistent.** Build Alternatives 3a and 3b would implement tolling or pricing strategies.	**Consistent.** Same as Build Alternatives 3a and 3b, respectively.	**Consistent.** Same as Build Alternatives 3a and 2b, respectively.	**Inconsistent.** Build Alternatives 6a and 6b would not include tolling or pricing strategies. Further, due to underuse of the proposed transit lane, these alternatives would not improve traffic operations in the project corridor compared to the No-Build Alternative 1. Build Alternatives 6a and 6b would manage lanes for transit during peak hours.	**Inconsistent.** Built Alternatives 7a and 7b would not include tolling or pricing strategies. Further, due to lanes being repurposed for HOVs, these alternatives would not improve traffic operations in the project corridor compared to the No-Build Alternative 1. Build Alternatives 7a and 7b would manage lanes for HOV use during peak hours.
Policy 14: Revenues generated from facility-based pricing should be used to build and maintain a regional network of paid express lanes and, where surplus revenue is available, on strategic transit services (e.g., express buses) or other mobility solutions that can reduce vehicle miles traveled and provide multiple travel options along priced corridors.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Partially Consistent**. Although Build Alternatives 2a and 2b would not implement tolling or pricing strategies, they would take steps to allow future tolling or pricing.	**Consistent.** Build Alternatives 3a and 3b would implement tolling or pricing strategies.	**Consistent.** Same as Build Alternatives 3a and 2b, respectively.	**Consistent.** Same as Build Alternatives 3a and 3b, respectively.	**Inconsistent.** Build Alternative 6a and 6b would not include tolling or pricing strategies. Further, due to underuse of the proposed transit lane, these alternatives would not improve traffic operations in the project corridor compared to the No-Build Alternative 1.	**Inconsistent.** Build Alternative 7a and 7b would not include tolling or pricing strategies. Further, due to lanes being repurposed for HOVs, these alternatives would not improve traffic operations in the project corridor compared to the No-Build Alternative 1.
Policy 16: When implementing pricing strategies, both paid express lanes and mileage-based fees/PayGo, the region should make every effort to avoid negatively impacting lower-income and rural households. For regional implementation of PayGo, explore innovative options for setting fees, such as including offsetting incentives for non-vehicular travel, offsets to fees for disadvantaged households, and keying fee rates to maintenance and fix-it-first goals.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Partially consistent.** Build Alternatives 2a and 2b would not implement tolling or pricing strategies and the benefits to all communities would be equal. However, they would take steps to allow future tolling or pricing by adding or repurposing lanes for HOVs.	**Partially consistent.** Build Alternatives 3a and 3b would implement tolling or pricing strategies. It would benefit all travelers using the I-80/US-50 corridor, including environmental justice communities. While they would not negatively affect lower-income or rural households, these alternatives may have proportionally smaller benefits to lower-income and rural households who may be less able to pay fees for the use of managed lanes.	**Partially consistent.** Same as Build Alternatives3a and 3b, respectively.	**Partially consistent.** Same as Build Alternatives 3a and 3b, respectively.	**Partially consistent.** Build Alternatives 6a and 6b would add a transit lane in each direction. Although it would not include tolling or pricing strategies, it could potentially provide proportionally larger benefits to lower-income households using transit.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.

Policy	No Build Alternative 1	Build Alternatives 2a and 2b	Build Alternatives 3a and 3b	Build Alternatives 4a and 4b	Build Alternatives 5a and 5b	Build Alternatives 6a and 6b	Build Alternatives 7a and 7b
Policy 18: System expansion investments that are not directly paid for by new development should be focused on fixing major bottlenecks that exist today, and/or incentivize development opportunities in infill areas.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Consistent.** Build Alternatives 2a and 2b would address key existing bottleneck locations on I-80/US-50 in the project area.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Inconsistent.** Due to underuse of the proposed transit lane, these alternatives would not improve existing bottlenecks compared to the No-Build Alternative 1.	**Inconsistent.** Due to lanes being repurposed for HOVs, these alternatives would not improve existing bottlenecks compared to the No-Build Alternative 1.
Policy 22: Invest in bicycle and pedestrian infrastructure to encourage healthy, active transportation trips and provide recreational opportunities for residents and visitors.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Consistent.** Build Alternatives 2a and 2b would extend the westernmost limit of the existing Class I bicycle pathway along I-80 at the Yolo Causeway to connect to CR-32A.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.
Policy 23: Prioritize and incentivize transportation investments that benefit environmental justice communities.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Partially consistent.** Build Alternatives 2a and 2b would add or repurpose lanes for HOVs. The benefits to all communities would be equal, including environmental justice communities.	**Partially consistent.** Build Alternatives 3a and 3b would benefit all travelers using the I-80/US-50 corridor, including environmental justice communities. However, this alternative may have proportionally smaller benefits to environmental justice communities who may be less able to pay fees for use of HOT or express lanes.	**Partially consistent.** Same as Build Alternatives 3a and 3b, respectively.	**Partially consistent.** Same as Build Alternatives 3a and 3b, respectively.	**Consistent.** Build Alternatives 6a and 6b would add a transit lane in each direction, which could potentially provide proportionally larger benefits to environmental justice communities.	**Partially consistent.** Same as Build Alternatives 2a and 2b.
Policy 24: Invest in transportation improvements that improve access to major economic assets and job centers.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Consistent.** Build Alternatives 2a and 2b would improve circulation on I-80/US-50 in the project area, which would improve access to major economic assets and job centers.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Inconsistent.** Due to underuse of the proposed transit lane, these alternatives would not improve peak-hour circulation in the project corridor compared to the No-Build Alternative 1.	**Inconsistent.** Due to lanes being repurposed for HOVs, these alternatives would not improve peak-hour circulation in the project corridor compared to the No-Build Alternative 1.
Solano County General Plan							
Policy TC.P-1: Maintain and improve current transportation systems to remedy safety and congestion issues and establish specific actions to address these issues when they occur.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Consistent.** Build Alternatives 2a and 2b would include managed lanes to improve traffic operations on I-80/US-50 in the project area.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Inconsistent.** Due to underuse of the proposed transit lane, these alternatives would not improve peak-hour circulation in the project corridor compared to the No-Build Alternative 1.	**Inconsistent.** Due to lanes being repurposed for HOVs, these alternatives would not improve peak-hour circulation in the project corridor compared to the No-Build Alternative 1.
Policy TC.P-8: Actively participate with Caltrans, Solano Transportation Authority, cities, and other agencies to plan for any proposed future realignments of current interregional routes.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Consistent.** Build Alternatives 2a and 2b would include managed lanes to improve traffic operations on I-80/US-50 in the project area and this is being coordinated with other transportation planning agencies.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.

Policy	No Build Alternative 1	Build Alternatives 2a and 2b	Build Alternatives 3a and 3b	Build Alternatives 4a and 4b	Build Alternatives 5a and 5b	Build Alternatives 6a and 6b	Build Alternatives 7a and 7b
Policy TC.P-18: Encourage the development of transit facilities and operations along major corridors to connect the county with surrounding activity centers and regional destinations.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Consistent.** Build Alternatives 2a and 2b would include managed lanes to improve traffic operations on I-80/US-50 in the project area and development of a new Park-and-Ride Facility.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.
City of Davis General Plan							
Policy 1.2: Transportation access, accommodations, and circulation should contribute to creating a supportive environment for economic development in the downtown for both residents and visitors.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Consistent.** Build Alternatives 2a and 2b would improve traffic operations on I-80/US-50 in the project area, including around downtown Davis interchanges.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Inconsistent.** Due to underuse of the proposed transit lane, these alternatives would not improve peak-hour circulation in the project corridor compared to the No-Build Alternative 1.	**Inconsistent.** Due to lanes being repurposed for HOVs, these alternatives would not improve peak-hour circulation in the project corridor compared to the No-Build Alternative 1.
Policy 6.3: Address Davis' transportation needs as a major regional destination. Regularly coordinate with SACOG to ensure Davis transportation needs and priorities are appropriately considered. Coordinate with Yolo County, Solano County, and UC Davis to improve multi-modal access and connectivity between major intercity destinations. Coordinate with Yolobus, SACOG, UC Davis, and other relevant entities to provide direct public transportation service from Davis to Sacramento International Airport. Coordinate with Caltrans regarding highway corridor planning for segments that are within or may affect those within the Davis city limits related to: Highway lane widenings HOV lanes HOT lanes Interchange improvements or additions Bicycle connectivity	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Consistent.** Build Alternatives 2a and 2b would improve traffic operations on I-80/US-50 in the project area.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Inconsistent.** Due to underuse of the proposed transit lane, these alternatives would not improve peak-hour circulation in the project corridor compared to the No-Build Alternative 1.	**Inconsistent.** Due to lanes being repurposed for HOVs, these alternatives would not improve peak-hour circulation in the project corridor compared to the No-Build Alternative 1.
UC Davis 2018 Long Range Development Plan							
Provide Land for Remote Parking Facility: Reserve land for a remote 'park n bike' facility west of Old Davis Road, near the exit ramp for I-80; consider additional multi-modal transportation and clean energy features, such as the layering of renewable energy production atop surface parking lots; facilitation of regional transit access and high-speed charging stations for electric vehicles.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Consistent**. Build Alternatives 2a and 2b would include managed lanes to promote multi-modal transportation options and improve traffic operations on I-80/US-50 in the project area.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.

Policy	No Build Alternative 1	Build Alternatives 2a and 2b	Build Alternatives 3a and 3b	Build Alternatives 4a and 4b	Build Alternatives 5a and 5b	Build Alternatives 6a and 6b	Build Alternatives 7a and 7b
Preserve and Enhance the Bicycle and Pedestrian Infrastructure: Preserve, enhance, and expand bicycle and pedestrian infrastructure; expand bicycle pathways and increase bicycle parking areas throughout the campus; improve bicycle safety through educational programs; reduce bicycle and pedestrian conflicts; provide more designated areas for pedestrians; provide safe and gracious walkways for pedestrians throughout campus.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Partially consistent.** Build Alternatives 2a and 2b would extend the westernmost limit of the existing Class I bicycle pathway along I-80 at the Yolo Causeway to connect to CR-32A.	**Partially Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially Consistent.** Same as Build Alternatives 2a and 2b, respectively.
Foster A Healthier Transportation Ecosystem: Enhance and expand travel services and programs to meet the daily mobility needs of the campus community and create a healthier transportation ecosystem; promote more sustainable travel choices to improve health of the individual, the environment, and the institution.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Consistent.** Build Alternatives 2a and 2b would include managed lanes to promote multi-modal transportation options and improve traffic operations on I-80/US-50 in the project area.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.
Enhance Transit Service: Preserve and enhance transit service; continue to prioritize and improve transit access to the core campus area; consider improvements to the Hutchison Drive corridor for Unitrans buses and for safely mixing buses, bikes, and pedestrians.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Consistent.** Build Alternatives 2a and 2b would include managed lanes to promote multi-modal transportation options and improve traffic operations on I-80/US-50 in the project area.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Build Alternatives 6a and 6b would add a transit lane in each direction, which could improve public transit options and reduce SOVs.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.
Invest In Programs Before Parking: Invest in transportation programs before constructing additional parking infrastructure; offer programs and services that promote more sustainable travel choices and minimize impacts to overall parking supply; balance adequate parking supply with the campus objective to reduce GHG emissions.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Consistent.** Build Alternatives 2a and 2b would include managed lanes to promote multi-modal transportation options and improve traffic operations on I-80/US-50 in the project area.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.
Promote Ride Sharing: Promote carpools and vanpools as viable transportation options that reduce parking demand for the campus community; monitor the utilization of ride-hailing services and proactively manage campus circulation network to promote walking, biking, and busing as preferred travel modes.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Partially consistent.** The managed lanes under Build Alternatives 2a and 2b would incentivize increased vehicle occupancy, ride sharing, and/or transit use.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Build Alternatives 6a and 6b would add a transit lane in each direction, which could improve public transit options.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.

Policy	No Build Alternative 1	Build Alternatives 2a and 2b	Build Alternatives 3a and 3b	Build Alternatives 4a and 4b	Build Alternatives 5a and 5b	Build Alternatives 6a and 6b	Build Alternatives 7a and 7b
Single Occupancy Vehicle Reduction: Per the University of California Policy on Sustainable Practices, strive to reduce the percentage of employees and students commuting by single occupancy vehicles (SOV) in 2025 by 10 percent relative to 2015-16 SOV commute rate. By 2050, strive to have no more than 40 percent of employees and no more than 30 percent of all employees and students commuting by SOV.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Partially consistent.** The managed lanes under Build Alternatives 2a and 2b would incentivize increased vehicle occupancy and/or transit use, thereby reducing SOV.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Build Alternatives 6a and 6b would add a transit lane in each direction, which could improve public transit options and reduce SOVs.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.
Yolo County Revised Draft 2030 Countywide General Plan							
Policy CI-1.4: Continue to work with Caltrans, SACOG, cities, and other regional agencies to achieve timely construction of freeway, interchange, highway, and County Road improvements that are consistent with this General Plan. The County shall assist Caltrans in implementing improvements to State Highway facilities that are required due to new growth and are consistent with this General Plan.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Consistent.** Build Alternatives 2a and 2b would include managed lanes to improve traffic operations on I-80/US-50 in the project area.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.
Policy CI-1.10: Coordinate with appropriate entities to maintain the following as primary routes for emergency evacuation from Yolo County: I-80 – East into Sacramento and west toward Solano County and the San Francisco Bay Area.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Consistent.** Build Alternatives 2a and 2b would include managed lanes to improve traffic operations on I-80/US-50 in the project area.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.
Policy CI-2.1: When constructing or modifying roadways, plan for use of the roadway space by all users, including automobiles, trucks, alternative energy vehicles, agricultural equipment, transit, bicyclists, and pedestrians, as appropriate to the road classification and surrounding land uses.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Partially consistent.** Build Alternatives 2a and 2b would incentivize increased vehicle occupancy and/or transit use. They would also extend the westernmost limit of the existing Class I bicycle pathway along I-80 at the Yolo Causeway to connect to CR-32A.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Build Alternatives 6a and 6b would add a transit lane in each direction, which could improve the attractiveness of riding transit. It would also extend the westernmost limit of the existing Class I bicycle pathway along I-80 at the Yolo Causeway to connect to CR-32A.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.
Policy CI-2.3: Ensure that, wherever feasible, public transit and alternative mode choices are a viable and attractive alternative to the use of single occupant motor vehicles.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Partially consistent.** The managed lanes under Build Alternatives 2a and 2b would incentivize increased vehicle occupancy and/or transit use.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Build Alternatives 6a and 6b would add a transit lane in each direction, which could improve public transit options.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.

Policy	No Build Alternative 1	Build Alternatives 2a and 2b	Build Alternatives 3a and 3b	Build Alternatives 4a and 4b	Build Alternatives 5a and 5b	Build Alternatives 6a and 6b	Build Alternatives 7a and 7b
Policy CI-3.1: Maintain Level of Service (LOS) C or better for roadways and intersections in the unincorporated county. In no case shall land use be approved that would either result in worse than LOS C conditions or require additional improvements to maintain the required level of service, except as specified below. The intent of this policy is to consider level of service as a limit on the planned capacity of the County's roadways. I-80 (Davis City Limit to West Sacramento City Limit) – LOS F is acceptable to the County. LOS F is anticipated by Caltrans according to the Interstate 80 and Capital City Freeway Corridor System Management Plan (Caltrans 2009, as cited in Yolo County 2009).	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Consistent.** Build Alternatives 2a and 2b would improve traffic operations on I-80/US-50 in the project area. The "b" alternative would further improve operations by providing a direct connection of the managed lanes by flying over US-50 at the I-80/US-50 interchange.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Inconsistent.** Due to underuse of the proposed transit lane, these alternatives would not improve peak-hour circulation in the project corridor compared to the No-Build Alternative 1.	**Inconsistent.** Due to lanes being repurposed for HOVs, these alternatives would not improve peak-hour circulation in the project corridor compared to the No-Build Alternative 1.
Policy CI-3.3: CEQA review for subsequent projects will analyze project traffic and circulation impacts using both the Yolo County General Plan policies and Caltrans policies as applicable. A. Consider the following objectives, following consultation with Caltrans, when making decisions to expand or modify the State highway system in Yolo County: 1. Minimize impacts to the environment. 2. Minimize increases in GHGs and air pollutants. 3. Minimize increases in VMT. 4. Minimize long-distance commute trips. 5. Fully utilize existing capacity while maintaining stable flows and speeds. 6. Provide facilities for all users including pedestrians, bicyclists, carpool users, and transit riders.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Partially consistent.** Build Alternatives 2a and 2b would incentivize increased vehicle occupancy and/or transit use, which could minimize increases in VMT and would provide facilities for carpool users and transit riders. Build Alternatives 2a and 2b would also improve an existing facility for bicyclists by extending the westernmost limit of the existing Class I bicycle pathway along I-80 at the Yolo Causeway to connect to CR-32A.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.
Policy CI-1.14: Encourage inter- and intra-regional traffic to use State and federal interstates and highways. The primary role of County Roads is to serve local and agricultural traffic.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Consistent.** Build Alternatives 2a and 2b would include managed lanes to improve traffic operations on I-80/US-50 in the project area, which could encourage inter- and intra-regional traffic to use these routes, rather than county roads.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.

Policy	No Build Alternative 1	Build Alternatives 2a and 2b	Build Alternatives 3a and 3b	Build Alternatives 4a and 4b	Build Alternatives 5a and 5b	Build Alternatives 6a and 6b	Build Alternatives 7a and 7b
Policy CI-4.3: Reduce dependence upon fossil fuels through: Reduction of vehicle trips and VMT by requiring compact, infill and mixed-use development. Use of alternatives to the drive-alone automobile, including walking, bicycling, and public transit. Promotion of ride sharing and car sharing programs.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Partially consistent.** Build Alternatives 2a and 2b would incentivize increased vehicle occupancy and/or transit use, which could promote the use of alternatives to the drive-alone automobile. They would also improve an existing facility for bicyclists.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.
City of West Sacramento General Plan							
Policy M-1.1: Connectivity. The City shall strive to develop a comprehensive, safe, and fully integrated multimodal transportation system that connects residents, visitors, and employees to the city and region through all available modes including connected vehicles, car/bikeshare, and autonomous modes.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Consistent.** Build Alternatives 2a and 2b would improve traffic operations on I-80/US-50 in the project area. The “b” alternative would further improve operations by providing a direct connection of the managed lanes by flying over US-50 at the I-80/US-50 interchange.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Inconsistent.** Due to underuse of the proposed transit lane, these alternatives would not improve peak-hour circulation in the project corridor compared to the No-Build Alternative 1.	**Inconsistent.** Due to lanes being repurposed for HOVs, these alternatives would not improve peak-hour circulation in the project corridor compared to the No-Build Alternative 1.
Policy M-1.2: Multi-modal Corridors. The City shall establish multi-modal corridors and hubs within and between urban centers and along major corridors.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Consistent.** Build Alternatives 2a and 2b would improve traffic operations and multi-modal opportunities on I-80/US-50 in the project area. The alternatives would include a new Park-and-Ride Facility in West Sacramento.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.
Policy M-1.3: Reduce Vehicle Miles Traveled. The City shall endeavor to reduce VMT and dependence on fossil fuels by continuing to develop a comprehensive multi-modal transportation system and compact, mixed-use development that includes more transit, bicycle, and pedestrian routes.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Partially consistent**. Build Alternatives 2a and 2b would incentivize increased vehicle occupancy and/or transit use. However, reduction in travel time with these alternatives would induce demand and increase VMT compared to the No-Build Alternative 1. They would also extend the westernmost limit of the existing Class I bicycle pathway along I-80 at the Yolo Causeway to connect to CR-32A.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Build Alternatives 6a and 6b would add a transit lane in each direction, which could improve the attractiveness of riding transit. It would also increase VMT compared to the No-Build Alternative 1 and extend the westernmost limit of the existing Class I bicycle pathway along I-80 at the Yolo Causeway to connect to CR-32A.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively. Build Alternative 7 would have the lowest increase in VMT.
Policy M-1.4: Public Involvement. The City shall continue to involve the public, especially those traditionally underserved by transportation services, and seek public input on transportation issues, projects, and processes from the early stage of the planning process.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Consistent.** Caltrans and other stakeholders have coordinated extensive public feedback on Build Alternatives 2a and 2b.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.

Policy	No Build Alternative 1	Build Alternatives 2a and 2b	Build Alternatives 3a and 3b	Build Alternatives 4a and 4b	Build Alternatives 5a and 5b	Build Alternatives 6a and 6b	Build Alternatives 7a and 7b
Policy M-1.8: Overcoming Barriers to Accessibility. The City shall strive to remove and minimize the effects of natural and manmade barriers, such as the Capital City Freeway, railways, Sacramento River, and the Deep Water Ship Channel, on accessibility between and within existing neighborhoods and districts.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Consistent.** Build Alternatives 2a and 2b would not change existing barriers or decrease accessibility between and within existing neighborhoods and districts.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.
Policy M-2.2: Connecting and Balance. The City shall preserve and continue to develop a comprehensive, integrated, and connected network of streets that balance walking and bicycling with public transit, automobiles, and trucks.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Consistent.** Build Alternatives 2a and 2b would improve traffic operations and multi-modal opportunities on I-80/US-50 in the project area.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.
Policy M-2.5: Street Amenities. The City shall require public transit, bicycle, and pedestrian amenities in street design to promote the walking, bicycling, and public transit use and complement the context of nearby centers, corridors, and neighborhoods.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Partially consistent.** Build Alternatives 2a and 2b would incentivize increased vehicle occupancy and/or transit use. It would also extend the westernmost limit of the existing Class I bicycle pathway along I-80 at the Yolo Causeway to connect to CR-32A.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Build Alternatives 6a and 6b would add a transit lane in each direction, which could improve the attractiveness of riding transit. It would also extend the westernmost limit of the existing Class I bicycle pathway along I-80 at the Yolo Causeway to connect to CR-32A.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.
Policy M-3.4: Multi-modal Roadway Level of Service. The City shall develop, maintain, and implement multi-modal LOS roadway standards to measure trade-offs among modes and/or create a more balanced transportation system. The City shall endeavor to achieve levels of service for bikeways, pedestrian ways, and public transit that are at least as efficient as the automobile LOS.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Partially consistent.** The managed lanes under Build Alternatives 2a and 2b may improve the public transit LOS. They may also improve LOS for bikeways by extending the westernmost limit of the existing Class I bicycle pathway along I-80 at the Yolo Causeway to connect to CR-32A.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Build Alternatives 6a and 6b would add a transit lane in each direction, which would improve the LOS for public transit. It may also improve LOS for bikeways by extending the westernmost limit of the existing Class I bicycle pathway along I-80 at the Yolo Causeway to connect to CR-32A.	**Partially consistent.**_Due to underuse of the lanes being repurposed for HOVs, this alternative would not improve peak-hour circulation for transit in the project corridor compared to the No-Build Alternative 1. It may improve LOS for bikeways by extending the westernmost limit of the existing Class I bicycle pathway along I-80 at the Yolo Causeway to connect to CR-32A.
Policy M-3.13: Emergency Service Coordination. The City shall coordinate development and maintenance of all transportation facilities with emergency service providers to ensure continued emergency service operation and service levels.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Consistent.** Build Alternatives 2a and 2b would implement a TMP during construction to maintain emergency service operations and response times. Improved peak-hour traffic operations on I-80/US-50 in the project area with Build Alternatives 2 through 5 would improve long-term emergency service operation.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.

Policy	No Build Alternative 1	Build Alternatives 2a and 2b	Build Alternatives 3a and 3b	Build Alternatives 4a and 4b	Build Alternatives 5a and 5b	Build Alternatives 6a and 6b	Build Alternatives 7a and 7b
Policy M-4.1: Access to Public Transit. The City shall strive to ensure that all residents have access to adequate and safe public transit options that reduce dependence on fossil fuels and increase physical activity.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Partially consistent.** The managed lanes under Build Alternatives 2a and 2b would incentivize increased vehicle occupancy and/or transit use.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Build Alternatives 6a and 6b would add a transit lane in each direction, which could improve public transit options.	**Partially consistent.** Same as Build Alternatives 2a and 2b.
Policy M-4.2: Affordable Public Transit. The City shall work with the Yolo County Transit District (Yolobus) to provide adequate and affordable public transit choices, including expanded bus routes and service.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Partially consistent.** The managed lanes under Build Alternatives 2a and 2b would incentivize increased vehicle occupancy and/or transit use.	**Partially consistent.** Same as Build Alternatives 2a and 2b.	**Partially consistent.** Same as Build Alternatives 2a and 2b.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent**. Build Alternatives 6a and 6b would add a transit lane in each direction, which could improve public transit options.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.
Policy M-4.3: Transit Priority. The City shall consider the use of transit preferential measures, such as signal priority, bypass lanes, and queue jumps, to improve transit service reliability.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Partially consistent.** The managed lanes under Build Alternatives 2a and 2b could improve transit service reliability.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Build Alternatives 6a and 6b would add a transit lane in each direction, which would improve transit service reliability.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.
Policy M-4.14: Park and Ride. The City shall cooperate with Caltrans and Yolobus in the development of Park-and-Ride facilities near major transportation corridors.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Consistent.** Build Alternatives 2a and 2b would include construction of a Park-and-Ride Facility in West Sacramento.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.
City of Sacramento 2035 General Plan Policies							
M.1.2.1. The City shall develop an integrated, multimodal transportation system that improves the attractiveness of walking, bicycling, and riding transit over time to increase travel choices and aid in achieving a more balanced transportation system and reducing air pollution and GHG emissions.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Partially consistent.** Build Alternatives 2a and 2b would incentivize increased vehicle occupancy and/or transit use. They would also extend the westernmost limit of the existing Class I bicycle pathway along I-80 at the Yolo Causeway to connect to CR-32A. The “b” alternative would further improve operations by providing a direct connection of the managed lanes via a managed lane connector ramp over US-50 at the I-80/US-50 interchange.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Build Alternatives 6a and 6b would add a transit lane in each direction, which could improve the attractiveness of riding transit. It would also extend the westernmost limit of the existing Class I bicycle pathway along I-80 at the Yolo Causeway to connect to CR-32A.	**Partially consistent.** Build Alternatives 7a and 7b would repurpose lanes for HOVs, which may incentivize carpool and transit use. However, this alternative would not improve circulation on the project corridor compared to the No-Build Alternative 1.
M.1.3.6. The City shall work with adjacent jurisdictions and SACOG to identify existing and future transportation corridors that should be linked across jurisdictional boundaries to provide desired upstream and downstream traffic operations and to preserve sufficient right-of-way.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Consistent.** Build Alternatives 2a and 2b would improve traffic operations on I-80/US-50 in the project area. The “b” alternative would further improve operations by providing a direct connection of the managed lanes by flying over US-50 at the I-80/US-50 interchange.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Inconsistent.** Due to the projected underutilization of the managed lanes under Build Alternatives 6 and 7, these alternatives would result in degraded I-80/US 50 corridor performance compared to the No-Build Alternative and would not meet the Project objectives.	**Inconsistent.** Due to lanes being repurposed for HOVs, these alternatives would not improve peak-hour circulation in the project corridor compared to the No-Build Alternative 1.

Policy	No Build Alternative 1	Build Alternatives 2a and 2b	Build Alternatives 3a and 3b	Build Alternatives 4a and 4b	Build Alternatives 5a and 5b	Build Alternatives 6a and 6b	Build Alternatives 7a and 7b
M.1.4.1. The City shall work with a broad range of agencies (e.g., SACOG, SMAQMD, SacRT, Caltrans) to encourage and support programs that increase regional average vehicle occupancy, including the provision of traveler information, shuttles, preferential parking for carpools/vanpools, transit pass subsidies, road and parking pricing, and other methods.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Consistent.** The types of managed lanes under Build Alternatives 2a and 2b would incentivize increased vehicle occupancy and/or transit use.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Inconsistent.** Build Alternatives 5a and 5b would create an express lane in each direction where all users pay a fee regardless of vehicle occupancy. Therefore, it would not encourage increased vehicle occupancy unless there were discounted fees for carpools.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.
M.1.5.6. The City shall support State highway improvement projects and management plans consistent with the MTP/SCS.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Consistent.** Build Alternatives 2a and 2b would improve traffic operations on I-80/US-50 in the project area consistent with the MTP/SCS. The “b” alternative would further improve operations by providing a direct connection of the managed lanes by flying over US-50 at the I-80/US-50 interchange.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Inconsistent.** Due to underuse of the proposed transit lane, these alternatives would not improve peak-hour circulation in the project corridor compared to the No-Build Alternative 1. It would be inconsistent with the MTP/SCS.	**Inconsistent.** Due to lanes being repurposed for HOVs, these alternatives would not improve peak-hour circulation in the project corridor compared to the No-Build Alternative 1. They would not be consistent with the MTP/SCS.
Sacramento County General Plan of 2005–2030							
Policy CI-2. Promote continued mobility for individuals whose access to automobile transportation is limited by age, illness, income, desire, or disability.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Partially consistent.** Although Build Alternatives 2a and 2b do not explicitly include improvements that benefit individuals whose access to automobile transportation is limited by age, illness, income, desire, or disability, Build Alternatives 2a and 2b include ITS, a park and ride facility, and auxiliary lane improvements that would help facilitate circulation between I-80 and the surrounding surface streets, benefiting environmental justice community members using bus and transit service.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.; however, Build Alternatives 6a and 6b add a transit-only lane, which may improve mobility for individuals who can access the existing transit system.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.
Policy CI-3. Travel modes shall be interconnected to form an integrated, coordinated, and balanced multi-modal transportation system, planned and developed consistent with the land uses to be served.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Partially consistent.** Build Alternatives 2a and 2b would improve operations and safety on I-80/US-50 in the project area, incentivize increased vehicle occupancy and/or transit use, and are consistent with the land uses to be served. These Build Alternatives include bicycle and pedestrian infrastructure improvements that would promote non-motorized travel modes throughout the project area.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.

Policy	No Build Alternative 1	Build Alternatives 2a and 2b	Build Alternatives 3a and 3b	Build Alternatives 4a and 4b	Build Alternatives 5a and 5b	Build Alternatives 6a and 6b	Build Alternatives 7a and 7b
Policy CI-4. Provide multiple transportation choices to link housing, recreational, employment, commercial, educational, and social services.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Partially consistent.** Build Alternatives 2a and 2b would not provide multiple transportation choices and would incentivize increased vehicle occupancy.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively. They would incentivize increased vehicle occupancy.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively. They would incentivize increased vehicle occupancy.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively; however, Build Alternatives 6a and 6b would incentivize transit use.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively and would incentivize increased vehicle occupancy.
Policy CI-11. To preserve public mobility, freeways and thoroughfares should have limited access and maintain functional characteristics that predominantly accommodate through-traffic.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Consistent.** Build Alternatives 2a and 2b would improve traffic operations on I-80/US-50 in the project area. The "b" alternative would further improve operations by providing a direct connection of the managed lanes via a managed lane connector ramp over US-50 at the I-80/US-50 interchange.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Inconsistent.** Due to underuse of the proposed transit lane, these alternatives would not improve peak-hour circulation in the project corridor compared to the No-Build Alternative 1.	**Inconsistent.** Due to lanes being repurposed for HOVs, these alternatives would not improve peak-hour circulation in the project corridor compared to the No-Build Alternative 1.
Policy CI-13: Collaborate with regional transportation planning agencies and neighboring jurisdictions to provide cross-jurisdictional mobility.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Consistent.** Build Alternatives 2a and 2b would improve traffic operations on I-80/US-50 in the project area, improving cross-jurisdictional mobility. The "b" alternative would further improve operations by providing a direct connection of the managed lanes via a managed lane connector ramp over US-50 at the I-80/US-50 interchange.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Inconsistent.** Due to underuse of the proposed transit lane, these alternatives would not improve peak-hour circulation in the project corridor compared to the No-Build Alternative 1.	**Inconsistent.** Due to lanes being repurposed for HOVs, these alternatives would not improve peak-hour circulation in the project corridor compared to the No-Build Alternative 1.
Policy CI-19. Collaborate with transit service providers to provide transit services within the County that are responsive to existing and future transit demand.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Partially consistent.** Although there would not be an exclusive transit lane under Build Alternatives 2a and 2b, transit use of managed lanes may result in reduced travel times for transit users.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Build Alternatives 6a and 6b would add a transit lane in each direction, which would promote transit services that are responsive to existing and future transit demand.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.
Policy CI-20. Promote transit services in appropriate commercial corridors and where population and employment densities are sufficient or could be increased to support those transit services.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Partially consistent.** Although there would not be an exclusive transit lane under Build Alternatives 2a and 2b, transit use of managed lanes may result in reduced travel times for transit users.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Build Alternatives 6a and 6b would add a transit lane in each direction, which would promote transit services that are responsive to existing and future transit demand.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.
Policy CI-23. Consider the transit needs of senior, disabled, low-income, and transit-dependent persons in making recommendations regarding transit services.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Partially consistent.** Although there would not be an exclusive transit lane under Build Alternatives 2a and 2b, transit use of managed lanes may result in reduced travel times for transit users.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Build Alternatives 6a and 6b would add a transit lane in each direction, which would reduce travel times for transit users and thereby may benefit senior, disabled, low-income, and transit-dependent persons.	**Partially consistent.** Same as Build Alternatives 2a and 2b, respectively.

Policy	No Build Alternative 1	Build Alternatives 2a and 2b	Build Alternatives 3a and 3b	Build Alternatives 4a and 4b	Build Alternatives 5a and 5b	Build Alternatives 6a and 6b	Build Alternatives 7a and 7b
Policy CI-41. Consider Transportation System Management programs that increase the average occupancy of vehicles and divert automobile commute trips to transit, walking, and bicycling.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Consistent.** The types of managed lanes under Build Alternatives 2a and 2b would incentivize increased vehicle occupancy and/or transit use.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Inconsistent.** Build Alternatives 5a and 5b would create an express lane in each direction where all users pay a fee regardless of vehicle occupancy. Therefore, it would not directly encourage increased vehicle occupancy.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.
Policy CI-42. Collaborate with other agencies to develop measures to provide for more efficient traffic flow, reduce vehicular travel demand and meet air quality goals.	**Inconsistent.** The No Build Alternative does not involve development of a transportation improvement project.	**Consistent.** To varying degrees, Build Alternatives 2a and 2b would improve traffic operations on I-80/US-50 in the project area, improving traffic flow. The "b" alternative would further improve operations by providing a direct connection of the managed lanes via a managed lane connector ramp over US-50 at the I-80/US-50 interchange.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Consistent.** Same as Build Alternatives 2a and 2b, respectively.	**Inconsistent.** Due to underuse of the proposed transit lane, these alternatives would not improve peak-hour circulation in the project corridor compared to the No-Build Alternative 1.	**Inconsistent.** Due to lanes being repurposed for HOVs, these alternatives would not improve peak-hour circulation in the project corridor compared to the No-Build Alternative 1.

Key:
CR=County Road; **HOV**=high-occupancy vehicle; **I**=Interstate; **LOS**=level of service; **MTP/SCS**= Metropolitan Transportation Plan (MTP)/Sustainable Communities Strategy (SCS); **SOV**=single-occupancy vehicle; **SR**=State Route; **TMP**=Transportation Management Plan; **VMT**=vehicle miles traveled

2.1.2.2 Environmental Consequences

No Build Alternative 1

Construction and Operation

Under No Build Alternative 1, managed lanes and transportation improvements would not be constructed or operated. As such, the No Build Alternative, as shown in Table 2.1-1, would be inconsistent with regional and local policies.

Build Alternatives 2a and 2b

Construction and Operation

Build Alternatives 2a and 2b would involve adding an HOV 2+ lane in each direction. Build Alternatives 2a and 2b would reduce congestion and improve safety along I-80/US-50 in the project area by incentivizing increased vehicle occupancy and thus reducing vehicular traffic demand. Build Alternatives 2a and 2b would be consistent or partially consistent with local and regional plans and policies related to improved transportation infrastructure. The “b” alternative would further improve operations by providing a direct connection of the managed lanes via a managed lane connector ramp over US-50 at the I-80/US-50 interchange (Table 2.1-1).

There will be impacts to Vehicle Miles Traveled (VMT), where the build alternatives will induce VMT through the project scope. As part of mitigation and to align with all local, regional, and state plans (including climate adaptation plans), the project will reduce VMT through VMT mitigation efforts.

As mentioned in the Fehr and Peers Technical Memo from May 2023, the methodology utilized for calculating VMT reduction for each mitigation measure is based on modeling techniques using two different modeling strategies. The modeling strategies (SACSIM and TDM+) put forth each mitigation measure for analysis on VMT effects. As each mitigation measure was analyzed with a modeling tool, each output was then put towards equations from the California Air Pollution Control Officers Association (CAPCOA) 2021 to calculate VMT reduction. Each mitigation measure’s VMT reduction is calculated and listed in the Technical Memo, as well as the VMT Mitigation Plan. Further, each mitigation measure was either part of SACOG’s MTP/SCS or its own environmental review analysis. SACOG’s MTP/SCS has a completed Environmental Impact Report, which incapsulates each project in the mitigation plan that is associated with the MTP/SCS.

The addition of three roundtrip train services on the Capitol Corridor route from Oakland to Sacramento would also reduce VMT, as mentioned in the attached VMT Mitigation Plan. The calculations and basis for the VMT reduction is based on a Traffic Congestion Relief Program (TCRP) equation, that utilizes a direct effect and indirect effect of train services. In this case, the three additional roundtrips save 6.3 million passenger miles, which is then multiplied by 2 to obtain the VMT reduction. Hence, the VMT reduction number of 12.6 million is shown in the VMT Mitigation Plan.

Build Alternatives 3a and 3b

Construction and Operation

Build Alternatives 3a and 3b would involve adding an HOT 2+ lane in each direction. As described under Build Alternatives 2a and 2b, Build Alternatives 3a and 3b would reduce congestion and improve safety along I-80/US-50 in the project area by incentivizing increased vehicle occupancy, thus reducing vehicular traffic demand. Tolling strategies would be consistent with SACOG, City, and County goals to provide a funding mechanism for capital costs; however, the fees may make these alternatives less beneficial to environmental justice communities or lower-income households who may be less able to pay fees for use of HOT lanes as further described in Section 2.1.7, Environmental Justice. Although there would not be an exclusive transit lane under Build Alternatives 3a and 3b, transit's use of managed lanes may result in reduced travel times for transit users. As described in the MTP/SCS, to resolve these inconsistencies, alternatives would explore innovative options for setting fees, such as including offsetting incentives for non-vehicular travel, offsets to fees for disadvantaged households, and keying fee rates to maintenance and fix-it-first goals. Accordingly, Build Alternatives 3a and 3b would be consistent or partially consistent with local and regional plans and policies (Table 2.1-1).

Build Alternatives 4a and 4b

Construction and Operation

Build Alternatives 4a and 4b would involve adding an HOT 3+ lane in each direction. Accordingly, Build Alternatives 4a and 4b propose a priced lane and would have similar effects related to consistency with local and regional plans and policies as Build Alternatives 3a and 3b, respectively.

Build Alternatives 5a and 5b

Construction and Operation

Build Alternatives 5a and 5b would be similar to Build Alternatives 3a and 3b, respectively; however, Build Alternative 5a and 5b would create an express lane in each direction where all users pay a fee regardless of vehicle occupancy. It would not encourage increased vehicle occupancy unless there were discounted fees for carpools, and as discussed in Table 2.1-1, Build Alternatives 5a and 5b would be inconsistent with Policy M.1.4.1 and Policy CI-41 from the City of Sacramento 2035 General Plan to encourage increased vehicle occupancy. Inconsistency with land use policies will potentially require Caltrans to work with local agencies to update existing land use plans to achieve consistency. Additionally, Caltrans will implement AMM EJ-1, EJ-2, and EJ-3, and VMT reducing measures (described in Table 2.1-27). Overall, Build Alternatives 5a and 5b are partially consistent with local policies related to improved transportation infrastructure.

Build Alternatives 6a and 6b

Construction and Operation

Build Alternatives 6a and 6b would involve adding a transit-only lane in each direction, which would promote and provide reduced travel times and would be consistent with policies supporting bus rapid transit service to Sacramento International Airport. Build Alternatives 6a and 6b would reduce congestion and improve safety in the project area by incentivizing increased transit and reducing vehicular traffic demand. Although it would not include tolling or pricing strategies, it could potentially provide benefits to lower-income households using transit by reducing travel times for transit users who are generally senior, disabled, low-income, and transit-dependent persons. Build Alternatives 6a and 6b would add a transit lane in each direction which could improve the attractiveness of riding transit. Build Alternatives 6a and 6b would be consistent or partially consistent with a majority of local and regional plans and policies; however, they remain inconsistent with several policies because they would result in degraded functionality in the project corridor compared to the No-Build Alternative 1. (Table 2.1-1). Inconsistency with land use policies will potentially require Caltrans to work with local agencies to update existing land use plans to achieve consistency. Additionally, Caltrans will implement AMM EJ-1, EJ-2, and EJ-3, and VMT reducing measures (described in Table 2.1-27).

Build Alternatives 7a and 7b

Construction and Operation

Build Alternatives 7a and 7b would involve repurposing the current number one general purpose lane to HOV 2+. No new lanes would be constructed. Consistency with local and regional plans would be mostly the same as described under Build Alternatives 2a and 2b, respectively, because Build Alternatives 7a and 7b do not propose a priced lane. However, they are inconsistent with several policies because they would result in degraded functionality in the project corridor compared to the No-Build Alternative 1. Inconsistency with land use policies will potentially require Caltrans to work with local agencies to update existing land use plans to achieve consistency. Additionally, Caltrans will implement AMM EJ-1, EJ-2, and EJ-3, and VMT reducing measures (described in Table 2.1-27).

2.1.2.3 Avoidance, Minimization, and/or Mitigation Measures

No AMMs or MMs are required.

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

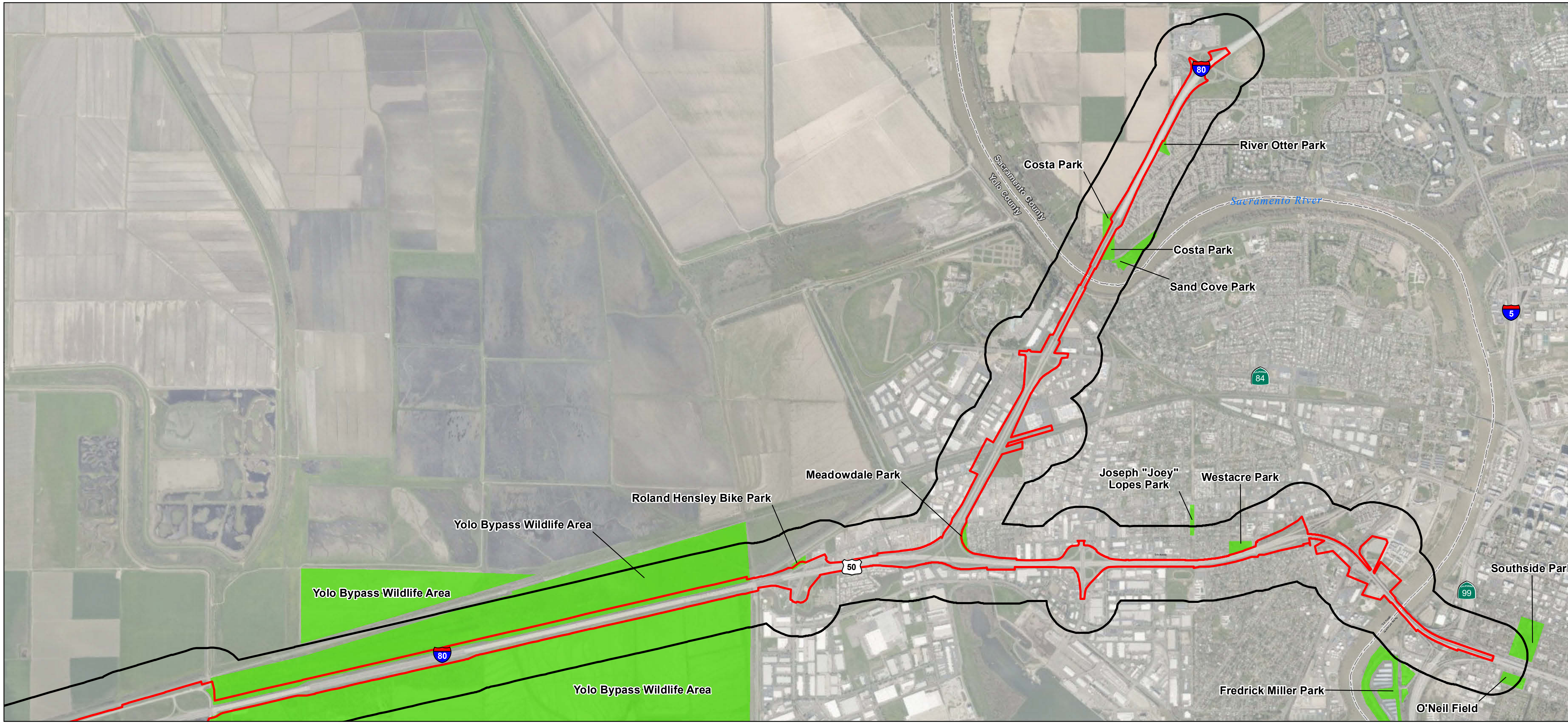
Information in this section is based on the CIA prepared for the project (Caltrans 2023a). Table 2.1-2 and Figure 2.1-2 summarize parks and recreational facilities located within 1,000 feet of the project area.

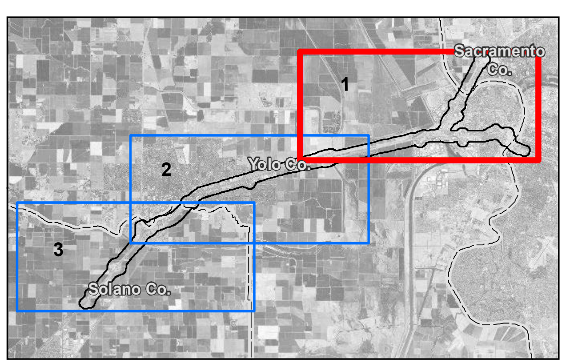
Table 2.1-2. Parks and Recreation Facilities within 1,000 Feet of the Project Area

Park and Recreational Facility Name	Description	Location	Park Operator
University of California, Davis (UC Davis) Arboretum and Public Garden	The UC Davis Arboretum and Public Garden spans the campus' 5,300-plus acres and includes the historic arboretum. It connects with the Putah Creek Riparian Reserve and is open to the public. Access is at various locations, but the visitor center is located on Le Rue Road.	1046 Garrod Drive, Davis, CA 95616	UC Davis
Putah Creek Riparian Reserve	The Reserve is a 640-acre natural riparian and grassland ecosystem maintained and operated by the UC Davis Arboretum and Public Garden. Most of the reserve is open to the public.	South of the intersection of Levee Road and Brooks Road, west of Highway 113, Davis, CA 95616	UC Davis Arboretum and Public Garden
Toad Hollow Dog Park	Toad Hollow Dog Park is a 2.5-acre, off-leash dog park.	1919 2nd Street, Davis, CA 95616	City of Davis
Playfields Park	Playfields Park is a City of Davis park, approximately 16 acres, with three baseball/softball fields, a soccer field, batting cages, basketball hoops, and playground equipment.	2500 Research Drive, Davis, CA 95618	City of Davis
Willow Creek Park	Willow Creek Park is a City of Davis park at 3800 Cowell Boulevard, approximately 5 acres, with play structures, a basketball area, and grassy areas.	3800 Cowell Boulevard, Davis, CA	City of Davis
Pioneer Park	Adjacent to Pioneer Elementary School in Davis, Pioneer Park includes a dog area, tennis courts, play structures, and restrooms.	5035 Swingle Drive, Davis, CA	City of Davis
Yolo Bypass Wildlife Area	The Wildlife Area comprises 17 separate management units covering approximately 16,600 acres. It is protected habitat for fish, waterfowl, migratory birds, raptors, invertebrates, snakes, and turtles. It is open daily to the public for wildlife viewing and fishing and includes self-driving tours along levees. Land also includes Tule Ranch, a working cattle ranch with extensive vernal pool areas.	45211 CR-32B, Davis, CA 95618	California Department of Fish and Wildlife, Bay Delta Region

Park and Recreational Facility Name	Description	Location	Park Operator
Roland Hensley Bike Park	Roland Hensley Bike Park is a 0.5-acre park in West Sacramento that provides a Class I bicycle lane that connects to the east end of the Yolo Causeway Bicycle Path. It includes a picnic area and water fountain.	4940 West Capitol Avenue, West Sacramento, CA	City of West Sacramento
Meadowdale Park	Meadowdale Park is a 4-acre park managed by West Sacramento and includes picnic tables, barbeques, a playground, and parking.	3625 West Capitol Avenue, West Sacramento, CA	City of West Sacramento
Joseph “Joey” Lopes Park	The Joey Lopes Park includes play structures, picnic tables, drinking fountains, and a half-court basketball.	840-878 Sycamore Avenue, West Sacramento, CA	City of West Sacramento
Westacre Park	Westacre Park is a 5-acre park with an enclosed skateboard park, picnic tables, and shade areas.	1755 Evergreen Avenue, West Sacramento, CA	City of West Sacramento
Jerome D. Barry Park	Jerome D. Barry Park is adjacent to the City’s 3-million-gallon water facility and includes small seating areas, multi-use lawns, picnic areas, and play structures.	809 Ballpark Drive, West Sacramento, CA	City of West Sacramento
Garden Park	Garden Park is a 0.5-acre park with raised garden beds, grassy areas, public art, and picnic tables.	564 Garden Street, West Sacramento, CA	City of West Sacramento
Fredrick Miller Regional Park	Fredrick Miller Regional Park is a 40.25-acre park and includes picnic tables, restrooms, river access, a boat ramp, a marina, and a concession bar.	2710 Ramp Way, City of Sacramento, CA	City of Sacramento
O’Neil Park	O’Neil Park consists of a lighted soccer field and a baseball/softball field with restroom facilities and parking.	715 Broadway, Sacramento, CA	City of Sacramento
Southside Park	Southside Park is a 20-acre park with tennis courts, basketball courts, a wading pool, jogging path, picnic tables, playgrounds, and a community garden.	2115 6th Street, Sacramento, CA	City of Sacramento
Sand Cove Park	Sand Cove Park is a beach and river access park that spans 9.88 acres with a small parking lot.	2005 Garden Highway, Sacramento, CA	City of Sacramento
River Otter Park	River Otter Park is a small (1.88-acre) park features a playground, volleyball court, and picnic tables.	2303 Barandas Drive, Sacramento, CA	City of Sacramento
Two Rivers Park	Two Rivers Park is a 3.03-acre joint-use school and neighborhood park that features a multi-purpose sports field, picnic area, tot lot, and walkways.	3166 Two Rivers Drive, Sacramento, CA	City of Sacramento

Source: Community Impact Assessment Memorandum (Caltrans 2023).





Land Use Study Area
ESL
County Line
Parks and Recreation Facilities

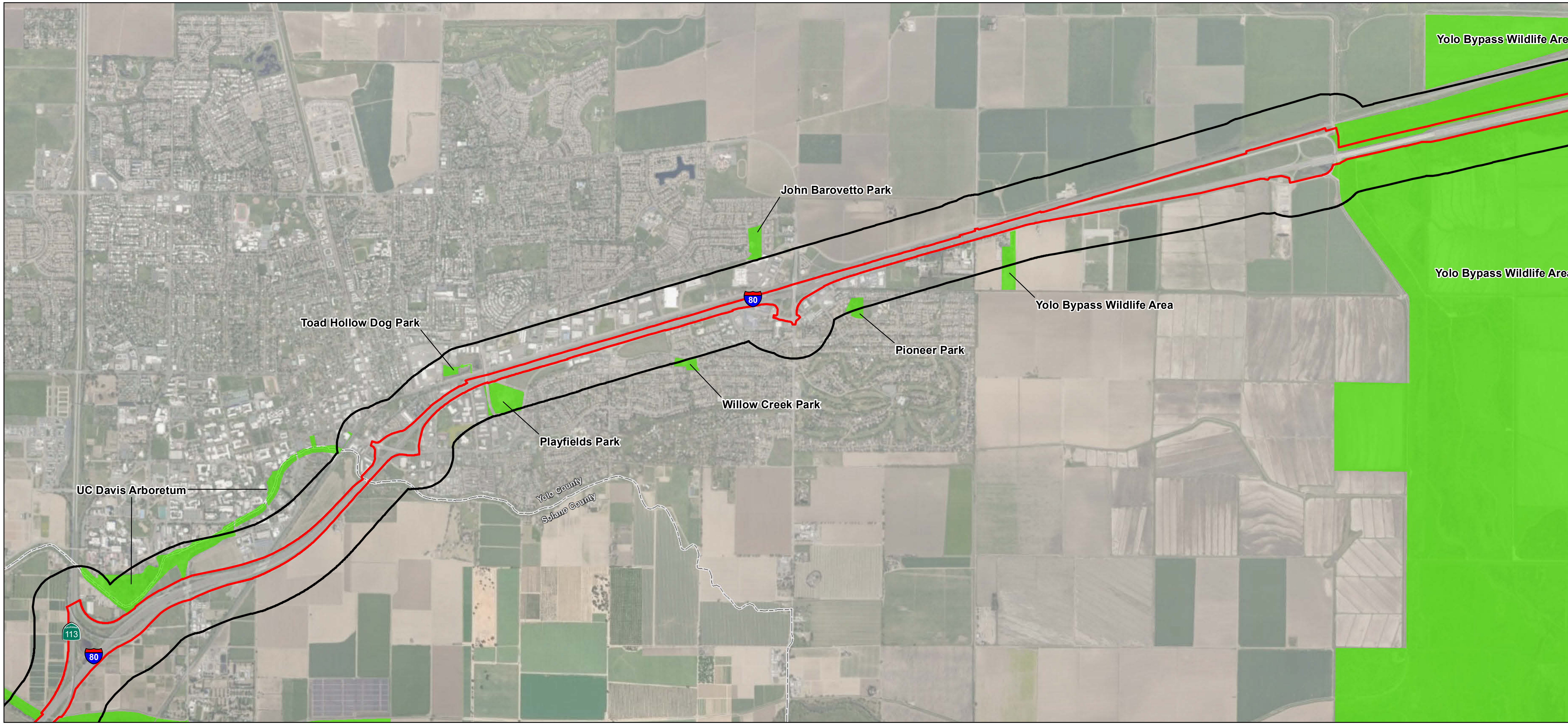
0
1
Miles

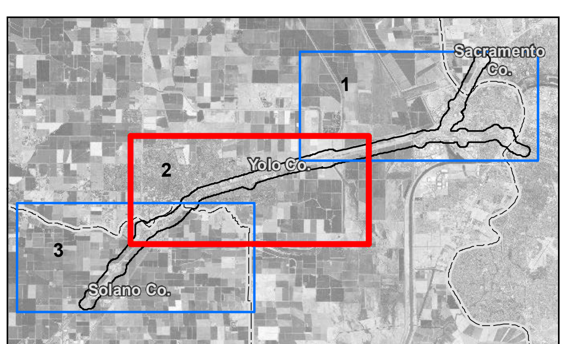
Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2021
3. Background: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\Figures\Fig_2.1-2_Parks.mxd Revised: 2021-10-21 By: pglendening

Caltrans

Figure 2.1-2
Parks and Recreation Facilities in the Land Use Study Area
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California





Land Use Study Area
ESL
County Line
Parks and Recreation Facilities

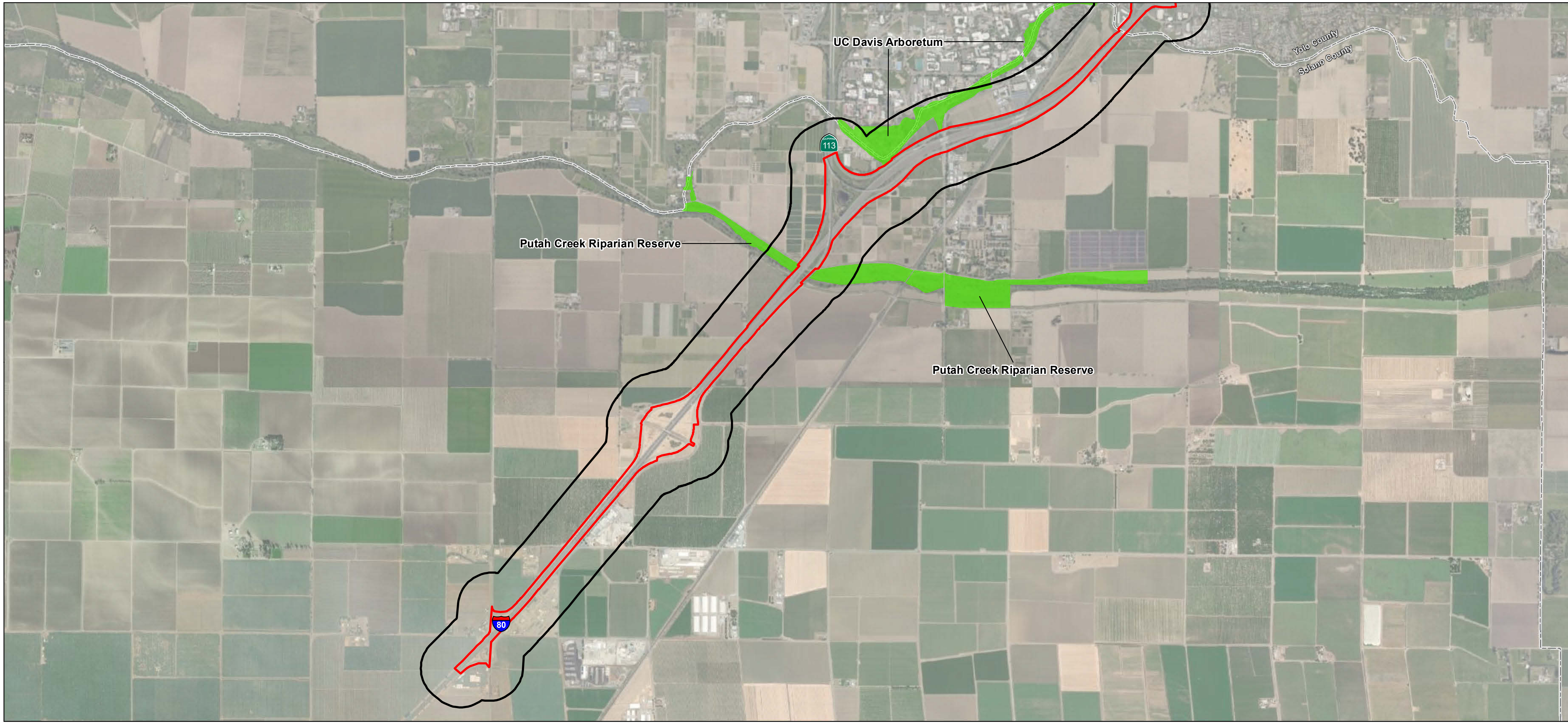
0 1
Miles

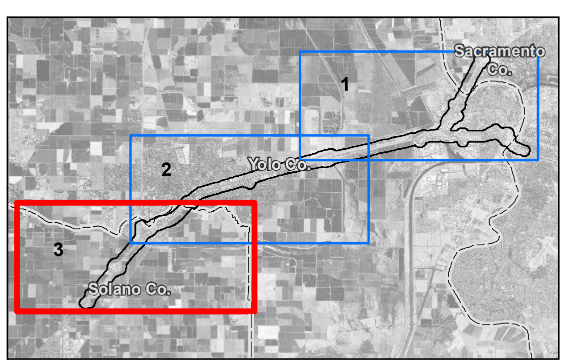
Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2021
3. Background: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Figure 2.1-2
Parks and Recreation Facilities in the Land Use Study Area

Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\Figures\Fig_2.1-2_Parks.mxd Revised: 2021-10-21 By: pglendening





Land Use Study Area
ESL
County Line
Parks and Recreation Facilities

0 1
Miles

Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2021
3. Background: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\Figures\Fig_2.1-2_Parks.mxd Revised: 2021-10-21 By: pglendening

Caltrans

Figure 2.1-2
Parks and Recreation Facilities in the Land Use Study Area
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

2.1.3.3 Environmental Consequences

No Build Alternative 1

Construction and Operation

Under No Build Alternative 1, managed lanes and transportation improvements would not be constructed or operated. As such, the No Build Alternative would have no effect on parks and recreational facilities.

Build Alternatives 2a and 2b

Construction

Build Alternatives 2a and 2b would involve adding an HOV 2+ lane in each direction. Construction of Build Alternatives 2a and 2b would occur almost entirely within the existing Caltrans right-of-way with the exception of a TCE and a staging area that would be located outside the Caltrans right-of-way. Several parks and recreational facilities are located within proximity of the project area and thus, users could be subject to potential air quality and noise impacts during construction. In particular, Build Alternative 2b would have a longer duration of construction than Build Alternative 2a and thus result in longer duration of exposure to potential impacts. The Section 4(f) technical memorandum prepared for the project concludes that the project would not require the permanent use or constructive use of a Section 4(f) park or recreational facility (Caltrans 2023b).

Build Alternatives 2a and 2b would require construction-related activities within Roland Hensley Bike Park and Yolo Bypass Wildlife Area that would result in temporary occupancy of these recreation resources. However, the duration of the occupancy would be temporary, the scope of work would be minor, no adverse impacts on protected activities or access would occur, the property would be restored to same or better condition than existing prior to the project, and the local jurisdictions would be involved (Caltrans 2023b).

Seven of the facilities identified in Table 2.1-2 (i.e., River Otter Park, Meadowdale Park, Westacre Park, Roland Hensley Bike Park, Yolo Bypass Wildlife Area, Putah Creek Riparian Reserve, and UC Davis Arboretum and Public Garden) are located adjacent to the Caltrans I-80 right-of-way and are currently subject to indirect air quality and noise impacts. Build Alternatives 2a and 2b would widen to the outside on the north side of I-80 from post mile 0.1 to post mile 1.0 in Yolo County, bringing traffic slightly closer to the Toad Hollow Dog Park. Noise analysis determined that changes in long-term noise levels would be 0 - 2 dBA greater than existing conditions, which would be barely perceptible, and the Toad Hollow Dog Park is more than 250 feet from the I-80 travel lanes, with an active railroad line and Second Street between the park and highway. Therefore, no perceptible long-term changes in noise and air quality would occur at this park.

Build Alternatives 2a and 2b would have indirect air quality and noise impacts at these facilities due to proximity to construction activities and changes in long-term traffic volumes. As discussed in Section 2.2.6, Air Quality, Standard Measures GHG-1, GHG-2, GHG-3, GHG-4, and GHG-5 would be implemented for air quality. As discussed in Section 2.2.7, Noise, AMM NOI-1 would require noise-generating construction activities to be restricted to 7:00 a.m. to 7:00 p.m. on weekdays, with no construction occurring on weekends or holidays. If work is necessary outside of these hours, a construction noise monitoring program and provide additional noise controls would be implemented. Caltrans Standard Specifications Section 14-8.02 would require that noise levels not to exceed 86 dBA within 50 feet of the job site from the hours of 9:00 p.m. to 6:00 a.m. (Standard Measure NOI-1). Build Alternatives 2a and 2b would also implement Standard Measures NOI-2 through NOI-5 further reducing temporary construction noise levels. Indirect air quality and noise impacts as a result of the proposed project would not be expected to result in substantial impairment to any of the facilities' activities, features, or attributes (Caltrans 2023b).

Build Alternatives 2a and 2b would replace the existing bicycle pathway pavement behind the gas station located north of West Capitol Avenue from PM 9.15 to PM 9.35. The existing bicycle pathway would be rerouted during repaving activities for up to two months, and repaving activities may occur at nighttime to minimize access disruption. To maintain access, bicycles traveling westbound would be redirected along West Capitol Avenue; and bicycles traveling eastbound would be redirected along a short segment of sidewalk on West Capitol Avenue and would use the crosswalk at the West Capitol Avenue/westbound I-80 off-ramp intersection. Bicyclists would then continue eastbound along West Capitol Avenue using the existing bicycle lane. Caltrans would add crosswalk pavement marking across the westbound I-80 off-ramp to West Capitol Avenue and near the existing West Capitol Avenue crosswalk. In addition, Caltrans would add advanced warning signs to alert the motorists traveling on the westbound I-80 off-ramp to West Capitol Avenue before reaching the proposed crosswalk. Caltrans would place signage as part of the TMP to note the access updates and identify the bicycle/pedestrian detours.

Build Alternatives 2a and 2b would also replace the existing bicycle pathway pavement from PM 9.1 to the Yolo Causeway bridge deck approach at approximately PM 8.9. While the existing Class I bicycle pathway is closed, a temporary bicycle pathway with K-rail barriers would be placed along the I-80 westbound on-ramp from West Capitol Avenue. Up to 100 linear feet of existing barrier near PM 8.9 would be removed and realigned to allow bicycles to rejoin the existing Class I Bicycle Pathway along Yolo Causeway. The existing Class I bicycle pathway along the Yolo Causeway would not require closure during construction activities.

Build Alternatives 2a and 2b would extend the westernmost limit of the existing Class I bicycle pathway from I-80 along Yolo Causeway to connect to CR-32A. Once construction of the pathway extension along the westbound I-80 off-ramp is complete, pavement from CR-32A to Levee Road would be rehabilitated. During pavement rehabilitation activities, Levee Road would be closed. Bicycles would be redirected along the newly constructed pathway extension on the westbound I-80 off-ramp to access the existing Class I bicycle pathway along Yolo Causeway, which would be built prior to rehabilitation activities on Levee Road. Temporarily rerouting the bicycle paths would inconvenience bicycle pathway users.

Construction activities may result in temporary traffic delays and ramp closures on I-80/US-50 that could cause temporary delays in accessing recreation facilities in and near the project area.

However, Standard Measure TT-3 would require that a traffic management plan is in place to maintain access. The TMP would plan construction in sections, with no more than one lane closed at a time and no successive ramp closures. The contractor would implement a planned public outreach program to keep area residents, businesses, emergency service providers, and transit operators informed of the project construction schedule as part of Standard Measure COM-1. With these standard practices, no AMMs are required.

None of the temporary construction-related impacts would adversely affect the activities, features, or attributes of the parks and recreation facilities in or near the project area.

Operation

Operation of Build Alternatives 2a and 2b would not require the acquisition of parks or recreational facilities. As a result, operation of Build Alternatives 2a and 2b would have no effect on parks or recreational facilities in or near the project area.

Build Alternatives 3a and 3b

Construction and Operation

Build Alternatives 3a and 3b would involve adding an HOT 2+ lane in each direction. Build Alternatives 3a and 3b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 4a and 4b

Construction and Operation

Build Alternatives 4a and 4b would involve adding an HOT 3+ lane in each direction. Build Alternatives 4a and 4b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 5a and 5b

Construction and Operation

Build Alternatives 5a and 5b would involve adding an Express Lane in each direction. Build Alternatives 5a and 5b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 6a and 6b

Construction and Operation

Build Alternatives 6a and 6b would involve adding a transit-only lane in each direction. Build Alternatives 6a and 6b propose similar project components within the same project area as

Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 7a and 7b

Construction and Operation

Build Alternatives 7a and 7b would involve repurposing the current number 1 general purpose lane to HOV 2+. No new lanes would be constructed. The effect would be similar to effects described under Build Alternatives 2a and 2b, respectively. Additionally, Build Alternatives 7a and 7b would have a shorter construction period than Build Alternatives 2a and 2b, respectively, and may result in fewer delays to park and recreation facilities in and near the project area.

2.1.3.4 Avoidance, Minimization, and/or Mitigation Measures

No AMMs or MMs are required.

2.1.4 Farmlands

2.1.4.1 Regulatory Setting

The National Environmental Policy Act (NEPA) and the Farmland Protection Policy Act (FPPA, 7 United States Code [USC] 4201-4209; and its regulations, 7 Code of Federal Regulations [CFR] Part 658) require federal agencies, such as the Federal Highway Administration (FHWA), to coordinate with the Natural Resources Conservation Service (NRCS) if their activities may irreversibly convert farmland (directly or indirectly) to nonagricultural use. For purposes of the FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance.

The California Environmental Quality Act (CEQA) requires the review of projects that would convert Williamson Act contract land to non-agricultural uses. The main purposes of the Williamson Act are to preserve agricultural land and to encourage open space preservation and efficient urban growth. The Williamson Act provides incentives to landowners through reduced property taxes to discourage the early conversion of agricultural and open space lands to other uses.

2.1.4.2 Affected Environment

Information in this section is based on the CIA prepared for the project (Caltrans 2023a).

The Department of Conservation Farmland Mapping and Monitoring Program (FMMP) produces maps and statistical data used for analyzing impacts on California agricultural resources. The important farmland category types are classified as:

- **Prime Farmland** – Prime Farmland is land that has the best combination of physical and chemical characteristics for the production of crops. It has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops when treated and managed, including water management, according to current farming methods. Prime Farmland must have been used for irrigated agricultural production at some time during the 4 years prior to the mapping date. It does not include publicly owned lands for which there is an adopted policy preventing agricultural use.

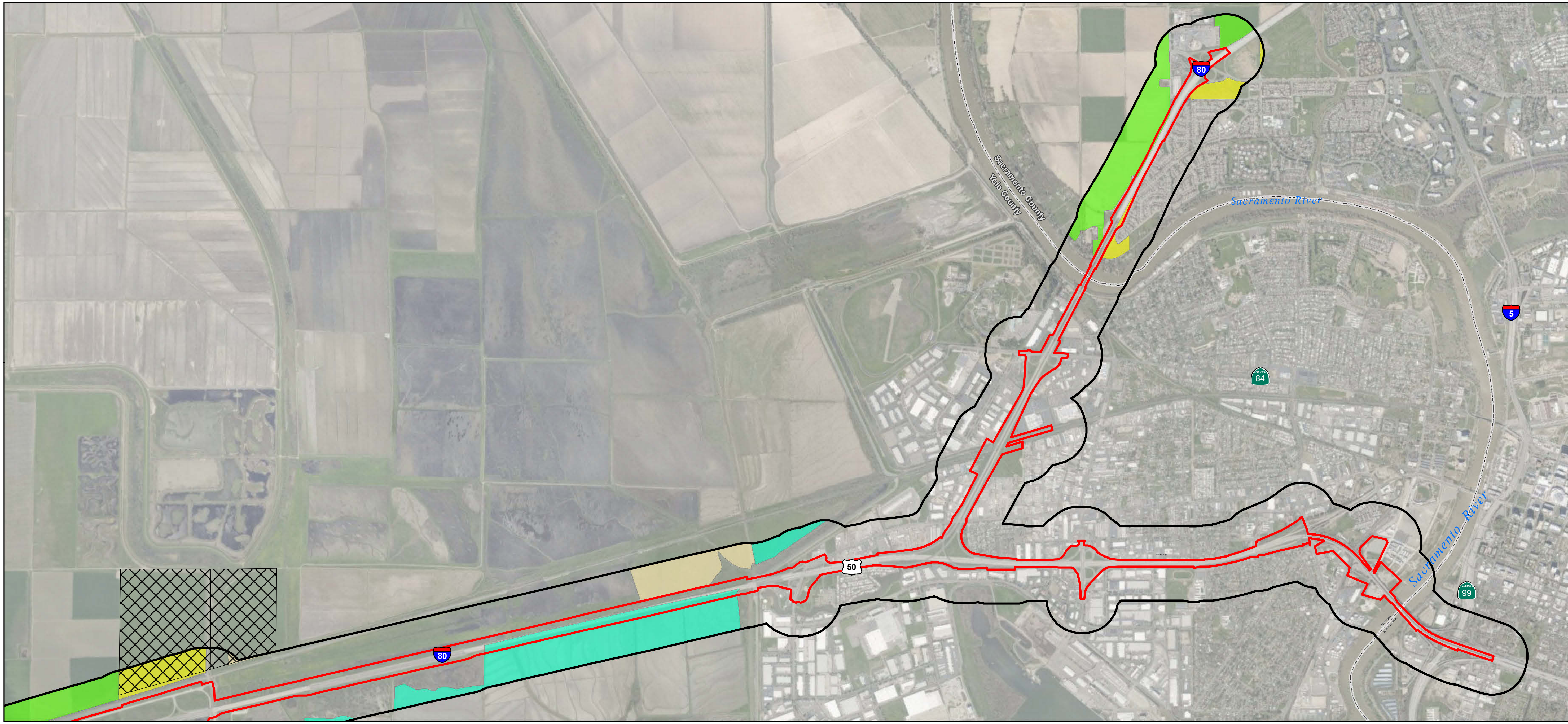
- **Farmland of Local Importance** – Farmland of Local Importance is either currently producing crops, has the capability of agricultural production, or is used for the production of confined livestock. Farmland of Local Importance is land other than Prime Farmland, Farmland of Statewide Importance, or Unique Farmland. This land may be important to the local economy due to its productivity or value. It does not include publicly owned lands for which there is an adopted policy preventing agricultural use.

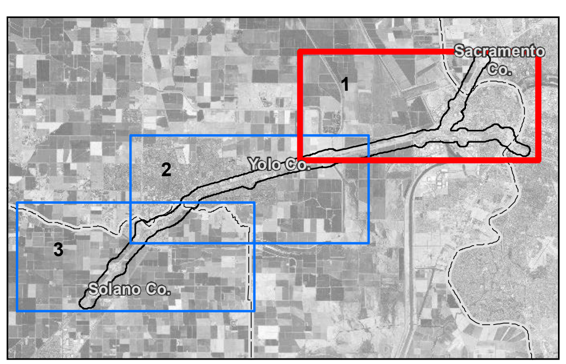
- **Unique Farmland** – Unique Farmland is land that does not meet the criteria for Prime Farmland or Farmland of Statewide Importance that has been used for the production of specific high economic value crops at some time during the 4 years prior to the mapping date. It has the special combination of soil quality, location, growing season, and moisture supply needed to produce sustained high quality or high yields of a specific crop when treated and managed according to current farming methods. Examples of such crops may include oranges, olives, avocados, rice, grapes, and cut flowers. It does not include publicly owned lands for which there is an adopted policy preventing agriculture use.

- **Urban and Built-Up Land** – Urban and Built-Up Land is used for residential, industrial, commercial, construction, institutional, public administrative process, railroad yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment plants, water control structures, and other development purposes. Highways, railroads, and other transportation facilities are mapped as a part of Urban and Built-Up Land if they are a part of the surrounding urban areas.

The Land Use Study Area includes several farmland areas, mostly located within unincorporated portions of Sacramento, Yolo, and Solano counties (Figure 2.1-3). The western segment of the Land Use Study Area in Solano County consists of agricultural lands with areas classified by the FMMP as Prime Farmland and Grazing Land. These areas are also mapped as an “Agricultural Reserve” by Solano County, indicating an area that experiences high development pressure, but where the County encourages voluntary conservation easements to promote the viability of agricultural operations.

East of the city of Davis, in unincorporated Yolo County, agricultural, open space, and wildlife refuge areas border I-80 across the Yolo Causeway, with several areas classified as Prime Farmland, Farmland of Local Importance, Unique Farmland, and Grazing Land, and Farmland of Local Potential (i.e., areas with soils characterized as being Prime or of Statewide Importance that are not presently irrigated or cultivated). At the northeastern end of the project, the portion of the Land Use Study Area north of I-80 is within unincorporated Sacramento County and contains areas designated as Prime Farmland. In this area, the portion of the Land Use Study Area south of I-80 is within the city of Sacramento and contains several small areas of Farmland of Local Importance.





Land Use Study Area
ESL
County Line

FMMP Farmland Type
Prime Farmland
Farmland of Local Imortance
Unique Farmland
Local Potential Farmland
Grazing Land

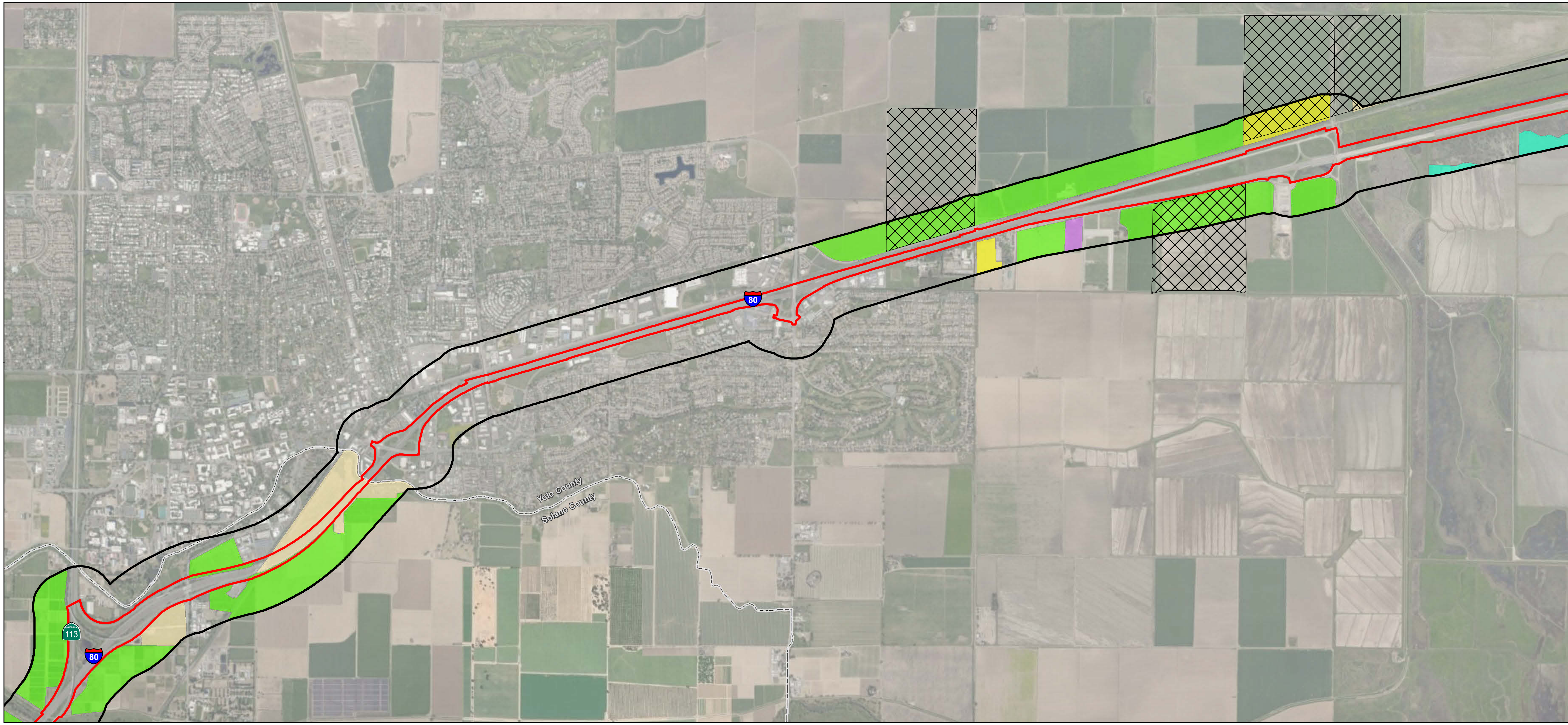
Williamson Act Parcel

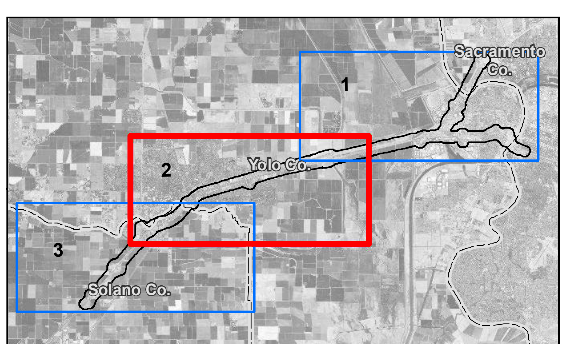
0 1
Miles

Figure 2.1-3
Farmland Mapped by the Farmland Mapping and Monitoring Program and Williamson Act Contracts
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2021
3. Background: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\Figures\Fig_2.1-3_FMMP.mxd Revised: 2021-10-21 By: pglendening





Land Use Study Area
ESL
County Line

FMMP Farmland Type

Prime Farmland
Farmland of Local Imortance
Unique Farmland
Local Potential Farmland
Grazing Land

Williamson Act Parcel

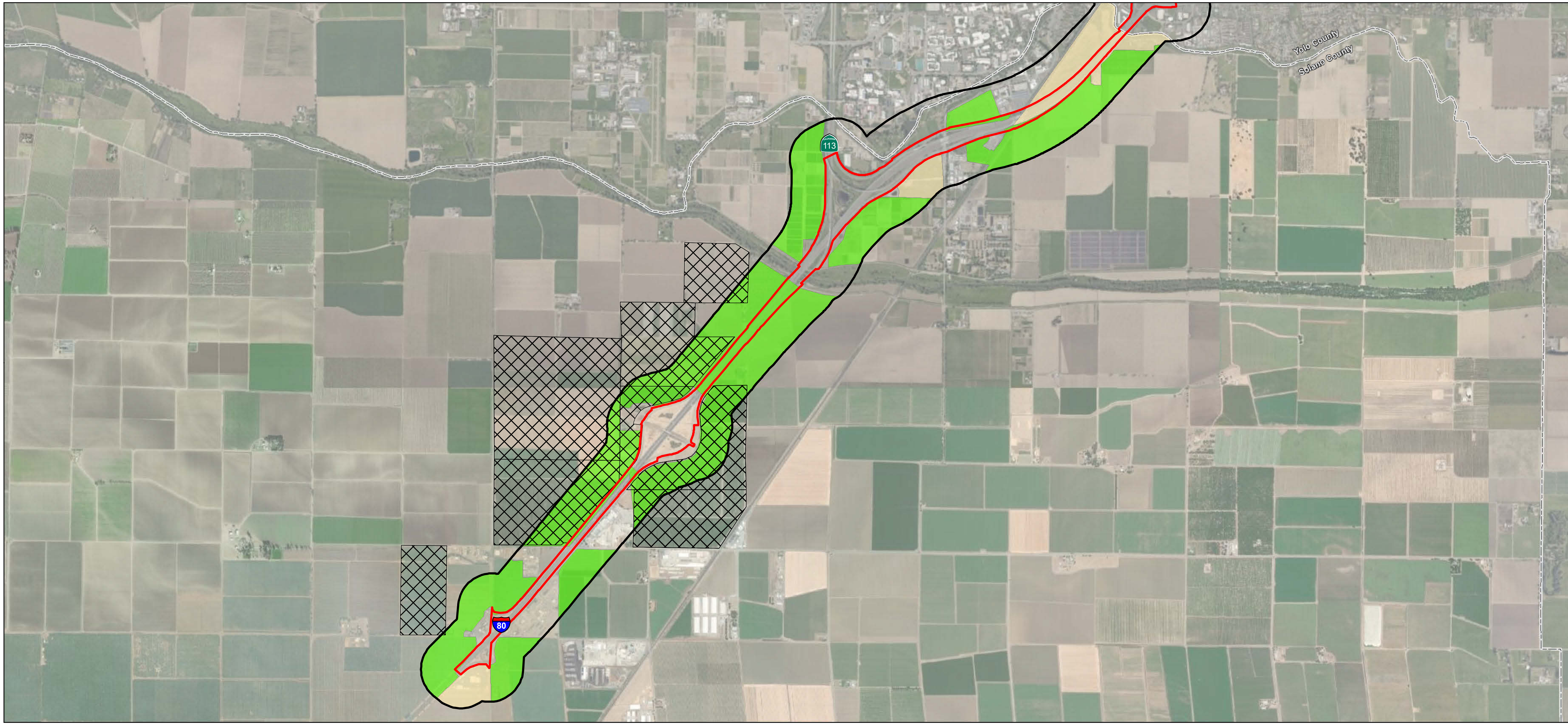
0 1
Miles

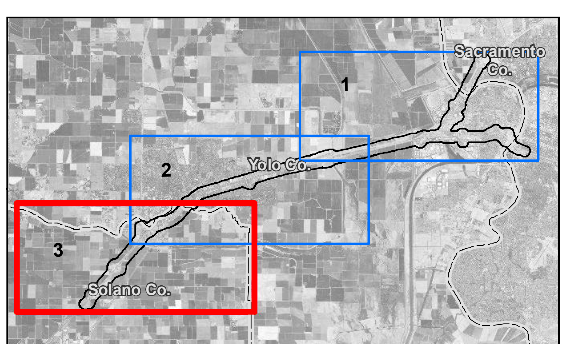
Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2021
3. Background: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Caltrans

Figure 2.1-3
Farmland Mapped by the Farmland Mapping and Monitoring Program and Williamson Act Contracts
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\Figures\Fig_2.1-3_FMMP.mxd Revised: 2021-10-21 By: pglendening





Land Use Study Area
ESL
County Line

FMMP Farmland Type

Prime Farmland
Farmland of Local Imortance
Unique Farmland
Local Potential Farmland
Grazing Land

Williamson Act Parcel

0 1
Miles

Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2021
3. Background: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\Figures\Fig_2.1-3_FMMP.mxd Revised: 2021-10-21 By: pglendening

Caltrans

Figure 2.1-3
Farmland Mapped by the Farmland Mapping and Monitoring Program and Williamson Act Contracts
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

In Solano County, several of the parcels designated as Prime Farmland are also under Williamson Act Contracts (Figure 2.1-3). There is also a Williamson Act parcel within Yolo County on a parcel along the Yolo Causeway that is classified as Local Potential Farmland.

The other portions of the Land Use Study Area, including the city of Davis, city of West Sacramento, and city of Sacramento are not agricultural and are classified by the FMMP as Urban and Built-up Land, Other Land, or Water.

2.1.4.3 Environmental Consequences

No Build Alternative 1

Construction and Operation

Under No Build Alternative 1, managed lanes and transportation improvements would not be constructed or operated. As such, the No Build Alternative1 would have no effect on farmlands.

Build Alternatives 2a and 2b

Construction

Build Alternatives 2a and 2b would involve adding an HOV 2+ lane in each direction, with Build Alternative 2b providing a direct connection of the managed lanes by flying over US-50 at the I-80/US-50 Interchange. Build Alternatives 2a and 2b would occur almost entirely within the existing Caltrans right-of-way and would not require the acquisition of Important Farmland or Williamson Act land for staging areas, TCEs, or to accommodate construction activities.

Operation

Build Alternatives 2a and 2b would occur almost entirely within the existing Caltrans right-of-way. Build Alternatives 2a and 2b would include a permanent easement for the proposed Park-and-Ride Facility. However, because this area is not designated as agricultural, Build Alternatives 2a and 2b would not result in the conversion of any Important Farmland or Williamson Act land to non-agricultural uses. As a result, Build Alternatives 2a and 2b would have no effect on Important Farmland or Williamson Act land in or near the project area.

Build Alternatives 3a and 3b

Construction and Operation

Build Alternatives 3a and 3b would involve adding an HOT 2+ lane in each direction. Build Alternatives 3a and 3a propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 4a and 4b

Construction and Operation

Build Alternatives 4a and 4b would involve adding an HOT 3+ lane in each direction. Build Alternatives 4a and 4b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 5a and 5b

Construction and Operation

Build Alternatives 5a and 5b would involve adding an Express Lane in each direction. Build Alternatives 5a and 5b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 6a and 6b

Construction and Operation

Build Alternatives 6a and 6b would involve adding a transit-only lane in each direction. Build Alternatives 6a and 6b propose similar project components within the same project area as Build Alternatives 2a and 2b. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 7a and 7b

Construction and Operation

Build Alternatives 7a and 7b would involve repurposing the current number 1 general purpose lane to HOV 2+. No new lanes would be constructed. Build Alternatives 7a and 7b would not change the overall number of lanes in the project area and would have no effect on Important Farmland or Williamson Act land in or near the project area.

2.1.4.4 Avoidance, Minimization, and/or Mitigation Measures

No AMMs or MMs are required.

2.1.5 Growth

2.1.5.1 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…"

2.1.5.2 Affected Environment

Information in this section is based on the CIA prepared for the project (Caltrans 2023a).

Growth inducement is defined as the relationship between the proposed transportation project and growth within the project area. It is often defined as the measurable increase in population, housing, and/or employment that can be reasonably attributable to implementation of a given project. The growth inducement assessment examines the relationship of the proposed project to economic and population growth or to the construction of additional housing in the project area. It focuses on the potential for a project to facilitate or accelerate growth beyond planned developments, or influence the location, type, and rate of future growth and development.

This section considers growth trends in the regional study area that include the greater Sacramento area and the surrounding counties of El Dorado, Placer, Sutter, Yolo, and Yuba counties as defined by the MTP/SCS. The MTP/SCS estimates that by 2040, the regional study area will have added 620,000 people, as well as the jobs and housing to support them (Table 2.1-3) (SACOG 2019a). SACOG's estimated growth pattern for the region is built by examining market forces and policy/regulatory influences, and is based on adopted local government general plans, community plans, specific plans, and other local policies and regulations. Based on this analysis, the six-county region's projected housing and employment is expected to grow at a faster rate than the state and national average over the next 30 years (SACOG 2019a). In 2019, the population of the regional study area totaled 2,324,773, representing approximately 6.22 percent of the state's total population. SACOG estimates that between 2016 and 2040, the regional study area will grow by 26 percent for a total population of 2,996,832 by 2040 (SACOG 2019b).

Table 2.1-3. Forecast Growth in the Regional Study Area

Year	Population	Employees	Households	Housing Units
2016	2,376,311	1,060,751	881,799	921,123
2040	2,996,832	1,300,813	1,136,599	1,181,251
Change 2016 to 2040	26%	23%	29%	28%

Source: Sacramento Area Council of Governments Draft Environmental Impact Report for the 2020 Metropolitan Transportation Plan/ Sustainable Communities Strategy (State Clearinghouse #2019049139)

Land use changes in the regional study area over the last 35 years have influenced regional travel patterns. These growth trends have contributed to changes in local traffic on I-80/US-50 in the project corridor. Additionally, since I-80/US-50 serves a broader area for freight, regional, and statewide traffic, growth in the Bay Area, Sacramento/San Joaquin Valley, and Sierra/Tahoe Region have also modified traffic patterns and volumes on I-80/US-50 in the project area.

Yolo County is the western edge of the Sacramento region, and an important part of the I-80/US-50 corridor linking Sacramento to the Bay Area. Over the last two decades, Yolo County has experienced most of its growth within the incorporated cities; Yolo County had an estimated 2019 population of 220,500, with much of the population residing in the incorporated cities of Davis (69,413), Woodland (60,548), West Sacramento (53,519), and Winters (7,315) (U.S. Census Bureau 2019). Yolo County continues to advocate for the protection of economically important agricultural resources and to direct growth into existing cities and unincorporated towns.

In Sacramento County, development patterns between 1980 and 2005 were typified by low-density, generally suburban development on the edges of established communities. A consequence of these development patterns has been a reliance on automobile travel to serve long-distance trips between residential areas, employment opportunities, and other activity centers. In 2004, the SACOG Board of Directors adopted the Sacramento Region Blueprint, a smart growth vision for the region. The goal of this Blueprint was to integrate land use and transportation planning to curb sprawl and cut down on vehicle emissions and congestion to improve the quality of life for residents of the region. Using smart growth principles, the Blueprint encourages a variety of housing options closer to employment, shopping, and entertainment hubs, which gives options for people to walk, bicycle, or take public transportation to work and play.

The following sections describe growth-related policies and plans from jurisdictions along the I-80/US-50 corridor.

Yolo County

The Yolo County Revised Draft 2030 Countywide General Plan (Yolo County 2009) includes goals and policies that guide land use and development, including the location of uses, population, housing, and job growth. Yolo County maintains a strong focus on protecting agricultural and open space resources and directing growth into existing incorporated cities and towns, as 93 percent of Yolo County remains in farmland and open space despite development pressures from the Sacramento and Bay Area metropolitan areas (Yolo County 2009), with most growth occurring in its incorporated cities and unincorporated towns. Most of the new urban growth allowed under the Yolo County 2030 General Plan would occur within the existing unincorporated communities of Dunnigan, Knights Landing, Madison, Esparto, and Elkhorn. The town of Esparto has most of the new housing potential.

Yolo County has adopted “smart growth” principles in its neighborhood and community design guidelines. The MTP/SCS forecast for unincorporated Yolo County is 3,300 new jobs and 2,800 new housing units, of which 2,500 new jobs and 2,700 new housing units are at the UC Davis campus (SACOG 2019a). Along the I-80 corridor, unincorporated Yolo County land is limited to agricultural, open space, and wildlife refuge designations between the cities of Davis and West

Sacramento. This area would not be subject to future development. Nevertheless, projected growth in Yolo County could contribute to changes in traffic patterns in the regional study area.

City of Davis

The city of Davis is the largest city in Yolo County with a 2019 population of approximately 68,500 persons and 25,800 housing units. The City of Davis has limited new growth areas and has implemented "slow growth" policies since the mid-1980s. The City of Davis General Plan reflects policies intended to manage growth; maintain existing community character as a small, University-oriented town surrounded by farmland, greenbelt, and natural habitat areas; and improve residential, office, and industrial areas (City of Davis 2007, 2017).

The City of Davis adopted a housing/growth resolution in 2008 that establishes an annual 1 percent growth cap (approximately 260 units), not counting affordable housing, accessory dwelling units, and units in mixed-use buildings. The resolution allows the Davis City Council to grant exemptions for projects providing extraordinary community benefits. Consistency with the growth cap is evaluated each year by the Davis City Council. By 2040, the MTP/SCS forecast for Davis includes 1,630 new employees and 3,800 new housing units; most of this growth—61 percent of the employment and 60 percent of the housing—is planned in established communities (SACOG 2019a).

University of California, Davis

Student enrollment at UC Davis increased from 25,315 students in 2000 to 39,629 students in 2019 (City of Davis 2017; UC Davis 2021). The UC Davis LRDP (2018) provides the growth policies for the main Davis campus and Russell Ranch research lands, totaling about 5,300 acres in Yolo and Solano Counties. The LRDP estimates increases in student enrollment, employment (faculty and staff), and campus student housing, and academic building space. The MTP/SCS forecasts 2,500 new jobs and 2,700 new housing units at the UC Davis campus (SACOG 2019a). Planned growth in student enrollment and employment at UC Davis contribute to traffic on I-80/US-50 in the project area.

City of West Sacramento

The City of West Sacramento has been a heavy employment base for the region, centered on the Port of (West) Sacramento and associated industrial and manufacturing uses, since the 1950s (City of West Sacramento 2016). In more recent years, the City of West Sacramento has shifted toward a mix of employment and housing, resulting in considerable residential growth over the last 20 years. The city's population has grown from 31,615 in 2000 to 53,151 in 2019 (U.S. Census Bureau 2019). In the past decade, the pace of residential development in West Sacramento has intensified.

Apart from the riverfront area, much of the northern half of the city is developed, though significant infill opportunity exists. West Sacramento's recent development focus has been mixed-use, high-density projects along the riverfront, including the Bridge District Specific Plan area, the proposed Pioneer Bluff area, and revitalization of the Washington Specific Plan area (SACOG 2019a). Residential growth over the last 20 years has focused on the Southport area, and it is now nearly built out. The MTP/SCS forecast for West Sacramento includes 16,590 new employees and 16,400 new housing units by 2040 (SACOG 2019a). Much of this development would occur in infill and redevelopment opportunities. Due to its location directly across the Sacramento River from Downtown Sacramento, and the type of development planned, West Sacramento is projected to become part of the urban core of the Sacramento region.

City of Sacramento

The city of Sacramento is centrally located within Sacramento County and is the largest city in the SACOG region, with 29 percent of the region's jobs and 21 percent of the region's housing units (SACOG 2019a). The city of Sacramento is projected to increase in population from approximately 513,624 in 2019 (U.S. Census Bureau 2019) to approximately 640,400 in 2035 and will require an additional 68,000 housing units by 2035 (City of Sacramento 2011). To meet forecasted housing needs, the City of Sacramento is trending toward more multifamily infill development instead of the historical trend of single-family residential growth in outlying areas. The MTP/SCS forecast includes 73,510 new housing units and 56,210 new employees by 2040 in the city of Sacramento, with approximately 48,510 new housing units and 32,210 new employees in the central city area through primarily infill and redevelopment projects (SACOG 2019a). Adding significant numbers of new housing developments to the central city area would provide a better jobs-to-housing ratio and help reduce regional VMT (SACOG 2019a). The small portion of the project limits located in the city of Sacramento (US-50 from Sacramento River to the US-50/I-5 interchange) is a developed, urban corridor with limited new growth potential.

2.1.5.3 Environmental Consequences

No Build Alternative 1

Construction and Operation

Under No Build Alternative 1, managed lanes and transportation improvements would not be constructed or operated. As such, the No Build Alternative 1 would have no effect on growth.

Build Alternatives 2a and 2b

Construction

It is anticipated for Build Alternatives 2a and 2b that construction workers would be drawn from either existing Caltrans staff or contractors in the local area who would commute from the neighboring cities. Therefore, the construction workforce would not be required to relocate to the area and thus would not require an increased demand for housing. As a result, construction activities would have no effect on growth.

Operation

Build Alternatives 2a and 2b would add capacity to I-80/US-50 within the project area. The purpose of the project is to improve traffic flow, help reduce congestion, and increase multi-modal opportunities for travel on the highway network. By improving access and highway capacity, Build Alternatives 2a and 2b would accommodate planned growth on a regional level and could indirectly change development patterns surrounding the project area by changing the rate at which planned development would occur along the corridor. The rate and location of regional growth and land use change may be influenced by travel time and travel cost for residents and workers. Improvements in access, traffic conditions, and lower travel costs can influence the attractiveness of some areas over others for future development. Induced travel assessments need to consider future land use sensitivity to these changing conditions.

However, Build Alternatives 2a and 2b would not remove an impediment to growth, provide an entirely new public facility, or provide new access to previously unserved areas. Build Alternatives 2a and 2b are analyzed to include expected demand and existing conditions that have arisen from past development trends.

The highway capacity enhancements are planned along an existing freeway corridor adjacent to agricultural lands, open space preserve, and within urbanized areas of the cities of Davis, West Sacramento, and Sacramento. By increasing freeway capacity and reducing travel costs, Build Alternatives 2a and 2b could change the rate of development expected compared to the No-Build condition. Since I-80 is a key link between the Sacramento and Bay Area, and homes in the Sacramento area are typically more affordable than homes in the Bay Area, the improved travel times on I-80 in the Project corridor could influence more Bay Area residents to move east to the Sacramento area and commute to job centers. However, other bottlenecks on I-80 and other highways into the Bay Area west of the Project (e.g., I-680, I-580, I-880, SR-37, SR-4) may deter commuters from Sacramento and outlying areas to the Bay Area. Within the Community Study Area, Areas of new residential development adjacent to the I-80 corridor are limited by floodplain conditions, long-term wildlife refuge and agricultural preserves, and built-out conditions in city limits. Improving travel times and capacity along I-80 is not expected to stimulate growth into nearby areas where development is not planned, as other impediments to growth (e.g., floodplain conditions, long-term wildlife refuge and agricultural preserves, and built-out conditions in city limits), market conditions, and local land use policies are a greater influence on land use change than roadway capacity.

However, smart growth policies in these existing communities prioritize infill and redevelopment projects. Additionally, development or redevelopment in these areas would be driven more by market conditions, economics, and local land use policies than the proposed transportation improvements. Accordingly, Build Alternatives 2a and 2b would not directly increase development of residential land uses, encourage growth outside of existing growth boundaries, or alter existing access to residential and employment areas. Therefore, no adverse effects associated with growth would be anticipated.

Build Alternatives 3a and 3b

Construction and Operation

Build Alternatives 3a and 3b would involve adding an HOT 2+ lane in each direction. Build Alternatives 3a and 3b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 4a and 4b

Construction and Operation

Build Alternatives 4a and 4b would involve adding an HOT 3+ lane in each direction. Build Alternatives 4a and 4b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 5a and 5b

Construction and Operation

Build Alternatives 5a and 5b would involve adding an Express Lane in each direction. Build Alternatives 5a and 5b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 6a and 6b

Construction and Operation

Build Alternatives 6a and 6b would involve adding a transit-only lane in each direction and would not increase the afternoon peak hour volume crossing the Yolo Causeway compared to the No Build Alternative. Under Build Alternatives 6a and 6b, considerable congestion would still occur on the Yolo Causeway. However, effects would be similar to Build Alternatives 2a and 2b, respectively; and no adverse effects associated with growth would be anticipated with implementation of Build Alternatives 6a and 6b.

Build Alternatives 7a and 7b

Construction and Operation

Build Alternatives 7a and 7b would involve repurposing the current number 1 general purpose lane to HOV 2+ and would not increase the afternoon peak hour volume crossing the Yolo Causeway compared to the No Build Alternative. Under Build Alternatives 7a and 7b, considerable congestion would still occur on the Yolo Causeway. However, effects would be similar to Build Alternatives 2a and 2b, respectively; and no adverse effects associated with growth would be anticipated with implementation of Build Alternatives 7a and 7b.

2.1.5.4 Avoidance, Minimization, and/or Mitigation Measures

No AMMs or MMs are required.

2.1.6 Community Character and Cohesion

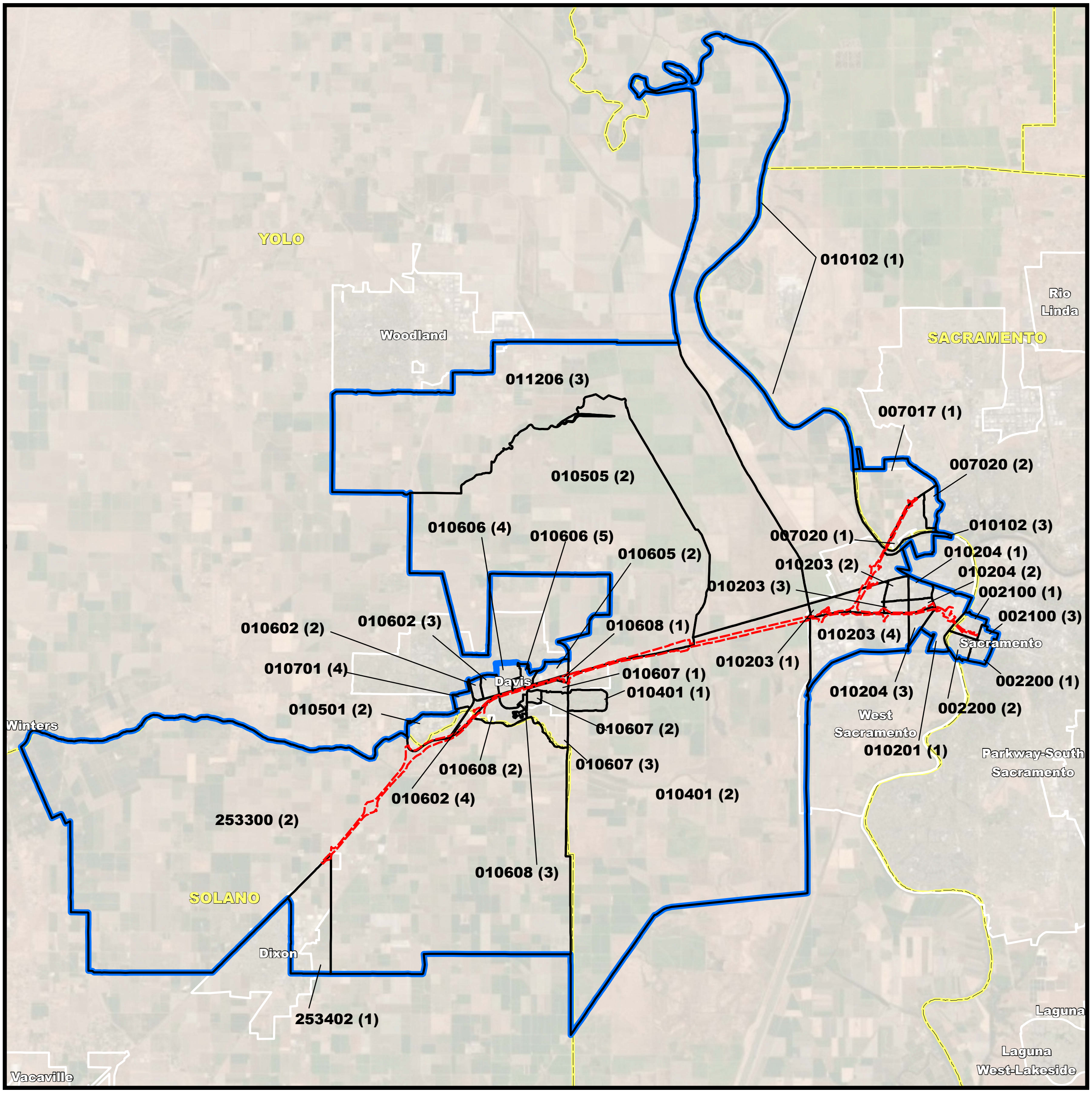
2.1.6.1 Regulatory Setting

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.

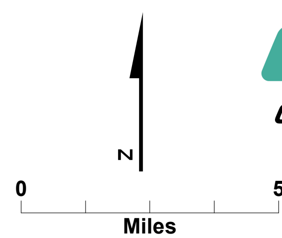
2.1.6.2 Affected Environment

Information in this section is based on the CIA prepared for the project (Caltrans 2023a). The community study area includes all census tracts and block groups immediately adjacent to the project footprint (Figure 2.1-4). Demographic characteristics for the community study area, including population demographics and economic data, were obtained from the US Census for the applicable census tracts and census block groups. The community study area was used to evaluate effects on community character in comparison to the regional study area, as defined under Section 2.1.5, Growth.



Legend

- Project Limits
- Census Block Groups
- Community Study Area



Service Layer Credits:
ESRI, National Geographic, DigitalGlobe, GeoEye

Data Sources: CalTrans, Stantec, AWE, 2021-2022
Date: 8/30/2022

Figure 2.1-4
Community Study Area
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

Regional Population Characteristics

Table 2.1-4 provides 2019 population for the state, regional study area, and community study area. Information for Yolo County and the cities of Davis, West Sacramento, and Sacramento are also provided for context. In 2019, the population of the regional study area totaled 2,324,773, representing approximately 6.22 percent of the state's total population. The regional study area is estimated to grow by 33 percent for a total population of 3,092,065 by 2045 (SACOG 2019a). The community study area population represents less than 3 percent of the regional study area population.

Table 2.1-4. Current Population (2019)

Area	2019 Population
California	39,283,497
Regional Study Area	2,488,449
Community Study Area	61,065
Yolo County	217,352
City of Davis	68,543
City of West Sacramento	53,151
City of Sacramento	500,930

Source: Source: U.S. Census Bureau 2019, Table B03002

Race and Ethnicity

The racial characteristics of the regional study area and community study area are presented in Table 2.1-5. The regional study area reflects a population that is a majority of white (52.1 percent). The white population accounts for 44.5 percent of the community study area's population, with the Hispanic or Latino population making the next highest majority at 28.4 percent, which is higher than the regional study area (22 percent). The population of Asian descent account for 16 percent of the community study area, which is higher than either the regional study area (13 percent) or state as a whole (14.3 percent). The population with black ethnicity makes up 4.7 percent of the community study area, which is lower than the regional study area (6.5 percent) and the state (5.5 percent). Persons identifying as Native American, Hawaiian or Pacific Islander, and Other Race ethnicities make up a small percentage of the community study area's population, at 0.2, 1.0, and 0.2 percent, respectively.

Table 2.1-5. Racial Distribution of Area Population

Area	Non-Hispanic							Hispanic or Latino
	White	Black or African American	American Indian or Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Other races	Two or more races	
California	37.2%	5.5%	0.4%	14.3%	0.4%	0.3%	3.0%	39.0%
Regional Study Area	52.1%	6.5%	0.4%	13.0%	0.8%	0.3%	4.8%	22.2%
Community Study Area	44.5%	4.7%	0.2%	16.0%	1.0%	0.2%	5.0%	28.4%
Yolo County	46.7%	2.4%	0.3%	13.9%	0.4%	0.2%	4.5%	31.6%
City of Davis	55.5%	2.1%	0.4%	22.7%	0.3%	0.4%	5.01	13.6%
City of West Sacramento	45.9%	4.6%	0.3%	10.5%	1.0%	0.1%	7.4%	30.1%
City of Sacramento	32.4%	12.7%	0.4%	18.6%	1.7%	0.4%	4.9%	28.9%

Source: U.S. Census Bureau 2019, Table B03002
Note: Percentages are based on the total number of persons in the area. The percentages do not total 100 due to margin of error and rounding.

Homogeneity of the population may contribute to higher levels of cohesion. Communities that are ethnically homogeneous often speak the same language, hold similar beliefs, and share a common culture, and are more likely to engage in social interaction on a routine basis. The community study area is ethnically diverse with 44.5 percent white, 28.4 percent Hispanic or Latino, 16.0 percent Asian, and 4.7 percent black or African American populations.

Age

As shown in Table 2.1-6, the age demographics of the community study area are similar to the regional study area. The community study area reflects a notably lower percentage of people over the age of 65 (10.4 percent) than the regional study area (15.0 percent). Additionally, the percentage of persons under the age of 18 in the community study area (21.7 percent) is slightly lower than the regional study area (23.3 percent). People over 65 and under 18 are considered more susceptible to the negative environmental effects resulting from construction projects (e.g., health impacts, air quality, noise). When compared to the regional study area as a whole, the community study area does not have a disproportionate percentage of people that are over 65 or under 18.

Communities with a higher percentage of residents aged 65 years or older tend to demonstrate a greater social commitment to their communities because they tend to be more active in the community as a result of having more time available for volunteering and participating in social organizations. The community study area has a lower population of people over age 65 (10.4 percent) than the Regional Study Area (15.0 percent).

Table 2.1-6. Age Statistics of Population

Area	Total (Under 18)	Percent of Population (Under 18)	Total (18 to 64)	Percent of Population (18 to 64)	Total (Over 65)	Percent of Population (Over 65)	Percent Under 18 and Over 65	Median Age
California	9,022,146	23.0	24,775,310	63.1	5,486,041	13.96	36.9	36.5
Regional Study Area	579,592	23.3	1,536,730	61.8	372,127	15.0	38.2	37.3
Community Study Area[1]	13,240	21.7	41,478	67.9	6,347	10.4	32.1	34.6
Yolo County	46,026	21.2	144,930	66.7	26,396	12.1	33.3	31.0
City of Davis	10,234	14.9	50,564	73.8	7,745	11.3	26.2	25.5
City of West Sacramento	13,875	26.1	33,183	62.4	6,093	11.5	37.6	34.3
City of Sacramento	115,731	23.1	319,570	63.8	65,629	13.1	36.2	34.5

Source: U.S. Census Bureau 2019., Tables B01001 and B01002
Note: 1 Age data is presented for all census tracts in the community study area.

Neighborhoods/Communities/Community Character

The community study area comprises multiple communities in Yolo and Sacramento counties. Communities are often delineated by physical barriers such as transportation infrastructure, large open spaces, and natural features such as rivers. The community study area is divided from north to south by I-80 and SR-51/I-80 Business/US-50, and from east to west by the Yolo Bypass Floodway, SR-113 in Davis, and the Sacramento River in West Sacramento and Sacramento. Pedestrian and bicycle crossing is limited over the river and over/under freeways and the floodway. The community study area includes portions of the following neighborhoods, described west to east.

Solano County

The western segment of the community study area begins in Solano County (Segment 1a) and consists of agricultural lands with few residents. Approximately 80 percent of the land in Solano County is agricultural or open space. Pockets of industrial properties are located along the I-80 corridor, such as between the Pedrick Road and Kidwell Road exits with facilities such as the CEMEX Dixon Tremont Concrete Plant. Based on the population density being low, community cohesion in unincorporated Solano County within the Project corridor is low.

City of Dixon

Dixon is located in northeastern Solano County and along I-80 within the Community Study Area. Dixon is characterized by its agricultural small-town character and is a community ringed by agricultural and open space lands. Dixon is a hub for grain, alfalfa, and dairy farming and has a long history in the sheep industry. The City hosts an annual sheep festival known as Lamb Town and the annual Dixon May Fair, the oldest state fair in California. The City of Dixon consists of pedestrian-oriented homes and businesses that are no more than three stories tall. I-

80 serves as a prominent gateway to the City of Dixon with a retail and service center geared towards highway travelers consisting of restaurants, gas stations, and motels. Based on the walkability and public space and housing design, social cohesion in the City of Dixon is moderate to high.

UC Davis Campus

I-80 crosses Putah Creek South Fork into the South Campus of UC Davis. Once I-80 crosses into Yolo County (Segment 1b), it is surrounded by the UC Davis 5,300-acre campus and associated agricultural research lands and open space, including the UC Davis Arboretum. The campus infrastructure encourages bicycling and walking with its many bike circles, wide bike lanes, and traffic signals specifically for bikes. Based on the large percentage of rental housing, small average household size, and transient student population, social cohesion at the UC Davis campus is low.

City of Davis

Between the Richards Boulevard and Mace Boulevard interchanges, Davis' south and east neighborhoods include a mix of residential and commercial land uses. Areas immediately adjacent to I-80 in Davis are characterized by multifamily residential, business, office, and commercial uses. Davis has a small-town atmosphere with an emphasis on parks and open spaces. It is a university town, with nearly one-third of all housing units occupied by students (City of Davis 2017). The Davis Farmers Market is held year-round on Wednesdays and Saturdays in Central Park. Davis has a reputation for excellent public schools, is a walkable and bikeable town, and has vibrant arts community influenced by the university offerings. Davis has also been a "slow-growth" city, resulting in housing shortages and high real estate prices. Based on the walkability, public space and housing design, racial diversity, and commute patterns indicating people work where they live, social cohesion in the City of Davis is moderate to high.

Yolo County

The community study area east of Davis (Segment 1c) is located within unincorporated Yolo County. Yolo County is typified by its small communities and rural character with over 93 percent of the county in farmland and open space. This portion of the community study area comprises agricultural and open space, as well as a wildlife refuge that borders the highway across the Yolo Causeway. The Yolo Causeway is a 3.2-mile-long elevated section of I-80 across the Yolo Bypass floodplain linking the cities of Davis and West Sacramento. The Yolo Bypass Wildlife Area is located within the Yolo Bypass, a flood control structure within the historic Yolo Basin floodplain. Based on the population density being low, social cohesion in unincorporated Yolo County within the Project corridor is low.

City of West Sacramento

In West Sacramento, the highway passes through the dominantly commercial and industrial areas along West Capitol Avenue and Industrial Boulevard. North of the I-80/US-50 interchange (Segment 2), I-80 is fronted by industrial, commercial, and business park areas. East of Harbor Boulevard (Segment 3a), US-50 passes adjacent to residential neighborhoods in the West

Sacramento, including Old West Sacramento, which is a hub for deep sea shipping and farming productions with a traditional neighborhood where homes date to the 1900s and show great pride of ownership; Pioneer Bluff which is a proposed mixed-use development area along the Sacramento River; and the Triangle or Bridge District which is a modern mixed-use redevelopment area near Raley Field with townhomes, condominiums, and single family residences. Based on the higher percentage of owner-occupied housing units and higher average household size, social cohesion in the City of West Sacramento within the Project corridor is moderate.

City of Sacramento

After crossing the Pioneer Bridge over the Sacramento River (Segment 3b), US-50 enters Sacramento. At the US-50/I-5 interchange, adjacent neighborhoods include Old Sacramento and the Southside Park neighborhood to the north and the Upper Land Park neighborhood to the south. Old Sacramento consists of historic buildings, wood-plank sidewalks, museums, the Sacramento River, and an ambience from the Gold Rush era. The historic buildings house numerous shops, restaurants, bars, and entertainment venues. This area was separated from downtown Sacramento with the construction of I-5 in the early 1970s. Old Sacramento attracts more than 3 million visitors annually. Southside Park is home to several corner markets and churches, including Our Lady of Guadalupe, which is a large Spanish-speaking church. Many annual celebrations and a Sunday Farmers Market are held throughout the year near Southside Park, a 20-acre park in this neighborhood. Upper Land Park is characterized by traditional neighborhoods, tree-lined streets, distinguished parks, and local shops. Based on the walkability, public space and housing design, and commute patterns indicating people work where they live, social cohesion in the City of Sacramento is moderate.

Housing

Table 2.1-7 and Table 2.1-8 provide data on the housing characteristics in the community study area and regional study area. As shown, in 2019, the community study area had 22,017 housing units, representing approximately 28 percent of Yolo County's total housing stock (77,947 units). Housing characteristics within the community study area vary from the housing characteristics in the regional study area. Fewer vacant housing units are available within the community study area (4.6 percent) compared to the regional study area as a whole (7.9 percent).

In the community study area, about 60 percent of the housing stock consists of single-family homes and 40 percent is multifamily, whereas the regional study area's housing stock in 2019 comprised 74 percent single-family units and 23 percent multifamily. Although subject to debate and dependent on the geographic location and other social factors, areas with a high proportion of single-family homes may be an indicator that a community has a higher degree of cohesion compared to areas with more multifamily housing.

The community study area has a significantly lower percentage of owner-occupied units at 47 percent as compared to the regional study area, and Yolo County has 60 percent and 52 percent, respectively. This difference may be due, in part, to the high percentage of rental units in Davis occupied by students. Communities with a higher percentage of owner-occupied residences are typically more cohesive because their population tends to be less mobile.

Homeowners often take a greater interest in what is happening in their communities than renters do because they have a financial stake in their communities. This often translates to a stronger sense of belonging to their communities.

The median value of homes in the community study area was also more than $134,000 higher than the overall regional study area median home value, and $83,000 more than that in Yolo County (Table 2.1-7).

The Census Bureau reports number of persons per household. This analysis assumes that higher persons per household translates to more families with children and that communities with a high percentage of families with children are more cohesive than communities consisting largely of single people. There are slightly fewer persons per household in the community study area (2.69 persons) than in either Yolo County (2.81 persons) or the regional study area (2.77 persons).

Table 2.1-7. Selected Housing Characteristics

Area	Total Housing Units	Percent Vacant (%)	Percent Single Family Units(%)	Percent multiple Family Units (%)	Percent Owner Occupied (%)	Median Value ($)	Median Rent ($ per month)
California	14,175,976	8.0	64.8	2.95	54.8	505,000	1,503
Regional Study Area	966,189	7.9	74.0	2.77	60.2	374,283	1,236
Community Study Area[1]	22,017	4.6	58.5	2.69	47.3	508,375	1,395
Yolo County	77,947	4.7	66.0	2.81	51.6	424,900	1,324
City of Davis	25,844	4.7	55.8	2.70	43.2	652,300	1,567
City of West Sacramento	19,478	4.6	69.9	2.84	56.9	349,800	1,026
City of Sacramento	196,652	5.8	66.9	2.66	48.5	336,900	1,263

Source: U.S. Census Bureau 2019, Tables B25002, B25003, B25010, B25024, B25064 and B25077
Note: 1. Housing data is presented for all census tracts in the community study area.

The community study area has higher percentages of householders who have lived in their units for shorter periods of time when compared to the regional study area and Yolo County (Table 2.1-8). The community study area comprises 13.5 percent householders who moved into their current housing unit since 2017, compared to 10.8 percent householders in the regional study area, and has only 7.4 percent householders who have lived in their current housing unit since prior to 1989, compared to the 10.2 percent householders in the regional study area. This may indicate that residents of the community study area have lived in the area for fewer years, or maybe a function of newer housing developments in the West Sacramento and Davis area. Communities with a high percentage of long-term residents are typically more cohesive because a greater proportion of the population has had time to establish social networks and develop an identity with the community.

Given the large percentage of rental units, high percentage of multi-family residential, and short average length of occupancy per housing unit, it is reasonable to assume a lower degree of social cohesion exists within the community study area as a whole compared to the regional study area. The City of Davis has the largest percentage of multi-family housing units and the largest percentage of rental units within the Community Study Area, indicating a lower level of cohesion. The City of West Sacramento has the largest percentage of owner-occupied housing and highest average householder size within the Community Study Area, indicating a moderate level of cohesion.

Table 2.1-8. Householder Tenure

Area	Year Householder Moved into Unit by Percentage					
	2017 or Later	2015 to 2016	2010 to 2014	2000 to 2009	1990 to 1999	1989 or Earlier
California	9.7	14.8	27.3	23.8	12.4	12.0
Regional Study Area[1]	10.8	16.6	27.8	23.7	10.9	10.2
Community Study Area[1]	13.5	22.4	27.4	20.9	8.5	7.4
Yolo County	11.9	18.3	26.3	22.4	11.0	10.0
City of Davis	18.3	23.4	21.1	15.6	12.3	9.2
City of West Sacramento	8.9	17.0	31.2	28.4	7.1	7.4
City of Sacramento	12.5	17.4	30.5	20.5	8.7	10.3

Source: U.S. Census Bureau 2019, Table B25038
Note: 1. Housing data is presented for all census tracts in the community study area.

Estimations from the MTP/SCS anticipate approximately 46,400 acres of land will be developed in the regional study area through 2040 to accommodate the projected increase of approximately 620,500 new residents, 260,000 new housing units, and 270,000 new employees (SACOG 2019a). To keep up with the housing demand, SACOG estimates that the region will need to produce 11,000 new homes annually on average (SACOG 2019a). Housing permit data from local building departments show increased demand for more closely situated, denser housing development in 2017 and 2018 (SACOG 2019a). SACOG's planning for future housing aligns with the Sacramento Region Blueprint, which aims to integrate land use and transportation planning to curb sprawl and reduce vehicle emissions and congestion.

Household Income

The average household size in the community study area (2.69 persons per household) was smaller than the regional study area (2.77) and the state as a whole (2.95) (Table 2.1-9). Median household incomes within the community study area ($70,759) were similar to the regional study area ($71,259) and lower than the state ($75,235). Census block groups within the community study area have some of the lowest and highest incomes in the region, with census tract 22, block group 2 (West Broadway in Sacramento) falling within the lowest range ($16,667 median household income) and census tract 106.07, block group 3 (El Macero in

Davis) falling within the highest range ($182,125 median household income). The percentage of families and individuals living below the poverty level within the community study area is higher than the regional study area or state percentage (Table 2.1-9).

Table 2.1-9. Selected Income Characteristics

Area	Population	Average Number of Persons per Household	2Median Household Income[1] ($)	Population Below Poverty Level	Percent of Individuals Below Poverty Level (%)	Percent of Families Below poverty Level[2] (%)
California	38,535,926	2.95	75,235	5,149,742	13.4	9.6
Regional Study Area	2,452,053	2.77	71,259	332,122	13.5	9.4
Community Study Area	101,654	2.69	70,759	21,906	21.5	10.9
Yolo County	209,222	2.81	70,228	39,919	19.1	9.0
City of Davis	66,738	2.70	69,379	19,900	29.8	6.4
City of West Sacramento	52,875	2.84	70,699	8,053	15.2	11.8
City of Sacramento	492,815	2.66	62,335	81,673	16.6	12.1

Source: U.S. Census Bureau 2019, Tables B19001, B17012, B19013, and S1701

Community Facilities

Community facilities may contribute to community cohesion by providing health and welfare resources to the local population or a means to interact with other members of the community. Community facilities include schools, libraries, museums, recreation facilities, health providers, emergency services, community centers, and other similar institutions. Facilities that are frequently accessed by the elderly, disabled, low-income, and minority populations are especially important because these groups often have limited mobility and may depend on transit for access.

This section provides a description of community facilities such as community centers, museums, and schools within the Land Use Study Area, which includes the project area plus a 1,000-foot buffer. These physical areas directly surrounding I-80/US-50 in the project area are considered the areas with the potential to experience direct effects on community facilities. Parks and other recreational facilities within the Land Use Study Area are described in Section 2.1.3, Parks and Recreational Facilities.

There are various community facilities in the Land Use Study Area within the city of Davis, including the Mondavi Center for the Arts, Davis Musical Theater Company, the Davis Amtrak Station, numerous bus stops, a US Post office, a Community Housing Facility, a California Department of Forestry and Fire equipment facility, the Yolo Hospice, and Yolo Community Care Continuum (a nonprofit organization serving people with mental illness).

Schools within the Land Use Study Area in Davis include the UC Davis Campus, UC Davis Extension sites, the Mondavi Institute for Wine and Food Studies, Peregrine Elementary School, and Pioneer Elementary School. The Land Use Study Area in Davis also includes an equestrian center, gymnastics center, multiple fitness centers, and numerous other commercial community facilities, such as stores and restaurants.

Within unincorporated areas of Solano County and Yolo County, there are occasional farm stands and other commercial facilities along I-80, as well as the Yolo Basin Foundation headquarters.

Community facilities in the Land Use Study Area in West Sacramento include the West Sacramento Health Education Council, West Sacramento KOA Campground and RV Park, numerous bus stops, DaVita Dialysis Center, California School Boards Association headquarters, a US Post Office, the West Sacramento Chamber of Commerce, River City Dance Academy, Collings West Sacramento Teen Center, Margaret McDowell Manor senior apartment complex, and Veterans of Foreign Wars post 8762.

Churches within the Land Use Study Area in West Sacramento include Community Lutheran Church, Our Lady of Grace Church, Center for Spiritual Awareness (a nondenominational community church), and River City Apostolic Church. Schools within the Land Use Study Area in West Sacramento include Westmore Oak Elementary School, West Sacramento School for Independent Study, Washington Unified School District offices, and James Marshall Nursery School.

In Sacramento, community facilities in the Land Use Study Area include Tenrikyo High Sacramento Church, Muslim Mosque Association, Saint John’s Missionary Baptist Church, and the California Automobile Museum.

Regional Economy

The community study area and regional study area have had economic growth and a low unemployment rate that has been supported by substantial growth in the real estate, construction, manufacturing, health care, and retail sectors. Over 2010–2019, Yolo County posted a 36.84 percent net gain in real gross domestic product (GDP), which outpaced the statewide average (36.15 percent). In comparison, Sacramento County and Solano County’s GDP grew by approximately 26.45 percent and 23.86 percent, respectively, between 2010 and 2019 (California Regional Economic Analysis Project 2021).

The I-80/US-50 corridor is an important facility for moving freight throughout California. I-80 is a major west-east connector through California, linking the Bay Area with the Sacramento Region and locations across the country. The 203-mile length of I-80 in California between US 101 and the California-Nevada line is designated as a primary link in the National Highway Freight Network by the FHWA (FHWA 2018).

Yolo County’s leading economic activity is agriculture and is supported by other industries such as warehousing and distribution, food processing, technology and biotechnology research and development, and higher education at UC Davis. The soils, growing climate, and water supplies in unincorporated Yolo County support agriculture. Almonds are Yolo County's leading commodity, followed by tomatoes, wine grapes, rice, and organic production. Yolo County is working to become a leader in economic sustainability, focusing on agricultural advancement, emerging green technology expertise, and eco- and agri-tourism opportunities. UC Davis is a leading generator of innovative graduates with expertise in all these industries.

Employment in Yolo County includes government, transportation, warehousing, retail. and agriculture. However, agriculture is on the decline due to increasing mechanization of farming, which reduces labor needs. Job growth is seen in education, healthcare, professional and business services, and leisure and hospitality, largely due to activities at the Cache Creek Casino. UC Davis is the largest employer, followed by Cache Creek Casino, the State of California, and the U.S. Postal Service.

Table 2.1-10 provides information on major employment sectors in the regional study area and community study area. According to the U.S. Census Bureau 2019 American Community Survey, the state had an available labor force of 18,591,241. Comparatively, the regional study area had an available labor force of 1,135,810. At the time of the census, approximately 2.6 to 4.8 percent of the available labor force in the regional study area was unemployed, as compared to 3.8 percent of the state (U.S. Census Bureau 2019). According to the State of California Employment Development Department (CEDD 2022), major employers in Yolo County include:

- Government offices such as the California Procurement Office, Yolo County District Attorney, Yolo County Sheriff's Office, and the City of Davis City Manager's Office
- Hospitals and health care businesses such as Beckman Coulter, Sutter Davis Hospital, Dignity Health Woodland, and the Woodland Healthcare Foundation
- Higher education at UC Davis
- Manufacturing and distribution centers such as Clark Pacific, Nor-Cal Beverage, Pacific Coast Producers, Target, and Rite Aid
- Other private corporations such as Cache Creek Casino Resort, United Parcel Service Customer Center, Tony's Fine Foods, Promega, Mariani Nut, IKEA, Clark Pacific, Capital Express Lines, Walmart, Mcguire & Hester, and Dennis Blazona Construction

Table 2.1-10. Employment Characteristics (2019)

Employment Area	Percentage of Workforce		
	California	Regional Study Area	Community Study Area
Management, business, science, and arts occupations	39.3	40.2	48.5
Service occupations	18.5	18.8	17.0
Sales and office occupations	21.2	22.3	16.8
Natural resources, construction, and maintenance occupations	9.0	8.4	7.9
Production, transportation, and material moving occupations	12.0	10.4	9.9

Source: U.S. Census Bureau 2019

Table 2.1-11 gives employment statistics and labor force composition. The unemployment rate in the community study area at 6.60 percent is slightly higher than the regional study area (6.14 percent) and Yolo County (6.19 percent). The composition of the labor force in the community study area has approximately the same percentage of women workers in the labor force as the regional study area and Yolo County. The labor force of employed persons who are college educated in the community study area (72 percent) is slightly higher than the regional study area (69 percent) and Yolo County (70 percent).

Table 2.1-11. Employment and Labor Force Composition

Area	Number Persons in Labor Force[1]	Number of Persons Employed	Number of Persons Unemployed	Percent Unemployed	Percent Women in Labor Force	Percent Employed and College Educated[2]
California	19,790,474	18,591,241	1,199,233	6.06	46.0	64.5
Regional Study Area	1,210,148	1,135,810	74,338	6.14	47.8	69.2
Community Study Area[3]	51,943	48,514	3,429	6.60	48.8	72.1
Yolo County	105,929	99,367	6,562	6.19	48.4	69.8

Notes:
1 Labor Force: Aged 16 years and older
2 College Educated Population: Aged 25 years and older with more than a high school education.
3 Data is provided on census tract level, not census block group
Source: U.S. Census Bureau 2019, Tables B23001, B24010, and B23006

There are several business centers along the I-80/US-50 corridor in the community study area. The major economic centers include commercial businesses, industrial and manufacturing centers, and office/business parks in Davis and West Sacramento. Major employment centers along the project corridor include UC Davis and the Port of (West) Sacramento.

The California Department of Tax and Fee Administration 2019–2020 Annual Report (CDTFA 2021) reported local sales and use tax revenue distributed for fiscal year 2019-2020 was $4.37 million to Yolo County, $7.33 million to Davis, $19.7 million to West Sacramento, and $85.4 million to the City of Sacramento. Total taxable transactions for the same period in Yolo County were $4.69 billion, Davis reported $0.55 billion, West Sacramento reported $1.59 billion, and the City of Sacramento reported $6.84 billion (CDTFA 2021).

The COVID-19 pandemic created economic uncertainty in the community study area. The region's economy, like many others throughout the state, was impacted due to the recession induced by the COVID-19 pandemic. This impact was mitigated to a degree by stimulus packages approved by the federal and state governments. In the transition to post-pandemic life, housing demand is higher than supply in the region as Bay Area residents continue to move inland in search of less expensive housing alternatives. Economic recovery from the pandemic is ongoing.

Commute Patterns

The Yolo basin floodway and the Sacramento River present natural physical barriers to traveling within the study area. Limited connectivity across rivers and floodways creates longer trip lengths, greater dependence on automobiles, concentrated vehicle traffic flows on the existing causeway and bridges and their connecting approach roadways, and a barrier to economic activity, social exchanges, recreational opportunities, and access to jobs within the urban core of Sacramento, West Sacramento, and Davis. According to a West Sacramento draft project report for the Broadway Bridge Project, peak morning and afternoon congestion is caused by local intercity commuters using the state highway system as a result of having few local river crossing options (City of West Sacramento 2022).

Table 2.1-12 shows the percentage of workers aged 16 years and older who commute to work using different modes of transportation. Transportation modes to work for workers in the community study area are somewhat consistent with Yolo County, with a slightly higher percentage of workers walking or biking and a slightly lower percentage of workers driving alone. The same differences are more pronounced when comparing the community study area to the regional study area, with a difference of 8.3 percent more workers walking or biking and 10.4 percent fewer workers driving alone. This difference is largely attributable to Davis, where more than 21 percent of the workers walk or bike to work, with two census block groups having 54 and 69 percent of its workers walking or biking to work. These statistics are also provided by census tracts in the table below. One census tract in Davis (census tract 106.08) has a high percentage of workers using public transportation at 18.3 percent, with the next highest at less than 8 percent. One census tract in Davis has a high percentage of workers working from home at 18.4 percent.

Table 2.1-12. Transportation to Work

Area	Total Number Workers[1]	Percent Drove Alone	Percent Carpool	Percent Public Transpor--tation	Percent Other	Percent Walk/Bike	Percent Work from Home
California	18,191,555	73.7	10.1	5.1	1.6	3.6	5.9
Regional Study Area[1]	1,115,602	76.9	9.6	2.2	1.2	3.1	7.0
Community Study Area	26,063	66.5	9.8	4.0	1.2	11.4	7.1
Yolo County	97,220	69.1	9.8	4.2	1.0	9.9	6.0
Census Tract and Census Block Groups in the Community Study Area[2]							
Segment 1a Kidwell Road to Solano/Yolo County Line							
2533 (2)	380	77.1	1.3	3.9	0.0	11.1	6.6
2534.02 (1)	903	74.0	18.3	0.0	0.0	1.9	5.9
105.01 (2)	643	16.6	3.3	4.4	4.8	68.9	2.0
Segment 1b Solano/Yolo County Line to Yolo Causeway							
106.02 (2-4)	1,970	49.5	7.5	1.9	0.5	25.3	15.3
106.06 (4-5)	1,264	65.2	2.5	7.7	0.0	14.6	10.0
106.08 (1-3)	2,470	49.3	2.1	18.3	0.5	20.7	9.1
107.01 (4)	261	27.6	0.0	0.0	0.0	54.0	18.4
106.05 (2)	554	73.5	4.2	1.6	0.9	11.2	8.7
105.05 (2)	222	69.8	0.0	0.0	0.0	24.3	5.9
106.07 (1-3)	1,725	63.7	10.8	0.5	0.9	11.5	12.6
104.01 (1-2)	1,739	76.5	8.9	3.7	0.0	4.3	6.6
Segment 1c Yolo Causeway to Enterprise Boulevard							
112.06 (3)	2,079	70.6	17.8	2.1	1.0	0.8	7.7
Segment 2 Enterprise Boulevard to West El Camino Avenue							
101.02 (1, 3)	1,672	60.3	17.6	0.0	1.1	8.3	12.7
70.20 (1, 2)	2,307	84.3	7.2	1.2	1.1	1.5	4.8
70.17(1)	665	86.3	7.7	0.0	2.7	0.0	3.3
Segment 3a I-80/US-50 to Jefferson Boulevard							
102.03 (1-4)	1,725	74.1	12.1	5.9	1.4	5.9	0.6
102.04 (1-3)	1,971	79.4	11.7	0.8	0.0	3.6	4.6
Segment 3b Jefferson Boulevard to I-5							
102.01 (1)	1,408	58.9	19.9	3.2	7.5	8.2	2.3
22 (1-2)	1,145	67.4	7.6	5.9	2.7	13.9	2.4
21 (1, 3)	960	78.0	8.9	1.9	0.0	10.4	0.8

Source: U.S. Census Bureau 2019, Table B08301
Notes: 1. Workers aged 16 years and older.
2. Census Block Groups are shown in parenthesis after the Census Tract numbers.

Table 2.1-13 shows commuting patterns and the location of employment relative to area of residence for workers over the age of 16. The community study area has a lower percentage of people who work within their county of residence (64 percent) than the regional study area (73 percent) and a higher percentage of people who work within their city or census-designated place of residence (38 percent) compared to the regional study area (31 percent). In general, communities with a high percentage of the population that reside and work in the same county or place of residence tend to demonstrate higher levels of involvement and interaction within their communities. The community study area also has a higher percentage of workers with a short commute time of less than 30 minutes (72 percent) compared to the regional study area (61 percent) and the state (56 percent). Communities with a high percentage of the population with shorter travel times to work are generally more cohesive than communities with longer commute times. When people spend less time commuting, they have more time to engage in their local communities and greater cohesion is demonstrated.

Table 2.1-13. Commuting Patterns

Area	Work Inside County of Residence	Work Outside County of Residence	Work Inside Place of Residence[1]	Work Outside Place of Residence	Travel Time to Work[2] <30 Minutes	Travel Time to Work 30 to 60 Minutes	Travel Time to Work >60 Minutes
California	82.4%	17.6%	35.1%	60.2%	56.0%	31.3%	12.7%
Regional Study Area[3]	72.6%	27.4%	30.5%	62.5%	60.5%	31.0%	8.6%
Community Study Area	64.2%	35.8%	38.3%	55.7%	72.1%	22.2%	5.7%
Yolo County	63.1%	36.9%	33.4%	61.3%	69.1%	23.5%	7.4%

Source: U.S. Census Bureau 2019, Tables B08007, B08008, and B08303
Notes:
1. Place of residence is defined as a city or census designated place.
2. Travel Time to Work percentages calculated using total number of workers, excluding those working from home.
3. Population for the regional study area based on the total population within the SACOG area, including El Dorado, Placer, Sacramento, Sutter, Yolo, and Yuba Counties.

The jobs-housing balance is the ratio of jobs to housing in a given area. If the jobs-housing ratio is too high, adequate housing may be unavailable or unaffordable for workers in that area, contributing to traffic congestion. If the jobs-housing balance is too low, this may indicate inadequate job availability for area residents. Table 2.1-14 shows a predicted improvement in the jobs-to-housing ratio for Yolo County and the regional study area through 2040. Providing housing near employment centers reduces commute distances and leads to improvements in traffic and air quality conditions. In regional land use and transportation planning, an improved jobs-to-housing ratio is defined as a ratio that moves toward the regional average. The majority of regional housing and employment growth in the regional study area, approximately 80 percent, is projected to occur in Sacramento County (61 of the total employment growth and 63 percent of the total housing growth) and Placer County (17 percent of the total for both employment and housing growth). Yolo County is projected to have the next highest amount of growth (10 percent of the total employment growth and 9 percent of the total housing growth), followed by El Dorado, Sutter, and Yuba counties (SACOG 2019). Table 2.1-14 illustrates how jobs-to-housing ratios are projected to change over the next 20 years.

Table 2.1-14. Summary of Jobs to Housing Ratios

Area	2016			2016–2040			2040		
	Dwelling Units	Employ-ees	Jobs to Housing Ratio	New Dwelling Units	New Employ-ees	Jobs to Housing Growth	Dwelling Units	Employ-ees	Jobs to Housing Growth
Yolo County	77,705	104,771	1.3	28,662	30,604	1.0	106,367	135,376	1.2
Regional Study Area[1]	921,123	1,060,751	1.2	260,128	270,060	1.1	1,181,251	1,330,813	1.2

Source: SACOG 2019
Note: 1 Population for the regional study area based on the total population within the SACOG area, including El Dorado, Placer, Sacramento, Sutter, Yolo, and Yuba Counties.

Toll Projects

Travelers do not currently pay tolls on roads or bridges in the community or regional study areas. The 2020 MTP/SCS prepared by SACOG has identified managed lane projects as an option for transportation revenue and pricing. Managed lanes are one tool for modernizing funding methods for transportation infrastructure. Pricing mechanisms can raise revenue to build and maintain the region’s transportation system, provide mobility benefits to residents, manage traffic and congestion, and help to achieve the state-mandated greenhouse gas reduction targets (SACOG 2019).

Build Alternatives 3, 4, and 5 all feature managed lanes with tolling options. Each Build Alternative has a distinct tolling structure that defines the Build Alternative as described in Section 1.5 Proposed Project. All tolling option alternatives feature at least one type of tolling exemption for certain occupancy classes of vehicles except Build Alternative 5, which requires that all motorists using the managed lane are subject to the toll regardless of the occupancy classification of the vehicle. The economic impacts of priced lanes must consider the equity of imposing tolls on roadway users, particularly low-income users.

2.1.6.3 Environmental Consequences

No Build Alternative 1

Construction and Operation

Under No Build Alternative 1, managed lanes and transportation improvements would not be constructed or operated. As such, the No Build Alternative 1 would have no effect on neighborhoods, communities, and community character.

Build Alternatives 2a and 2b

Construction

Under Build Alternatives 2a and 2b, construction activities would result in delays for roadway users and potentially affect access to surrounding businesses and community facilities. Build Alternative 2b would result in a longer construction timeline in order to build the I-80 connector structure, thus the effects of construction would be longer than Build Alternative 2a.

For both Build Alternatives 2a and 2b, ramp closures are anticipated at all ramp locations adjacent to proposed widening or proposed mainline paving and would occur for up to 15 days. Traffic would be detoured to the next interchange.

Build Alternative 2b may require a temporary, full closure on westbound US-50 for construction of the I-80 connector structure. Closures would be during night or during a continuous operation (24 or 48 hours). The primary detour for westbound US-50 traffic would be to use northbound I-5 to westbound I-80. Local traffic would use other interchanges in the area. Any full closures would be scheduled to take place during the hours of the lowest volume of traffic to minimize effects on businesses, commuters, and the local community.

A Traffic Management Plan (TMP) (Standard Measure TT-3) would be developed by Caltrans during the design phase. The TMP would include elements such as haul routes, one-way traffic controls to minimize speeds and congestion, flag workers, and phasing, to reduce impacts on local residents as feasible and maintain access for police, fire, and medical services in the local area. Additionally, the contractor would implement a planned public outreach program to keep area residents, businesses, emergency service providers, and transit operators informed of the project construction schedule as part of Standard Measure COM-1.

Furthermore, Build Alternatives 2a and 2b would also implement visual, noise, and air quality standard measures. Therefore, Build Alternatives 2a and 2b would not have substantial effects on the community during construction.

Operation

Build Alternatives 2a and 2b would involve adding an HOV 2+ lane in each direction. As described in Section 2.1.5, Growth, by improving access and highway capacity, Build Alternatives 2a and 2b would help accommodate planned growth on a regional level and could indirectly change development patterns surrounding the project area. A sound wall, mature trees, and vegetation are located between I-80 and residential properties, thus creating a buffer for noise impacts. Noise experienced by nearby residential development would be barely perceptible, which is consistent with existing conditions. Similarly, visual resource effects associated with Build Alternatives 2a and 2b would be compatible with the existing visual character of the corridor since the corridor is already developed as a roadway.

The operational air quality analysis concludes that mobile source air toxic (MSAT) and DPM emissions would decrease in future years compared to existing conditions, reducing pollutant burdens for households neighboring the highway. For Build Alternatives 2a and 2b, significant operational air quality impacts on nearby sensitive receptors are not expected as air quality is expected to improve in future years. However, fugitive sources of particulate matter, like tire wear, brake wear, and road dust are the largest fraction of particulate matter emissions from traffic, and they increase as VMT increases. Therefore, $PM_{2.5}$ and PM_{10} emissions would continue to increase as VMT in the corridor increases, adding to the pollution burden associated with fugitive particulate matter on communities next to the highway.

Build Alternatives 2a and 2b would occur primarily within the existing Caltrans right-of-way and would not provide new access to previously unserved areas. Build Alternatives 2a and 2b would require acquisition of a vacant parcel to construct a Park-and-Ride lot south of I-80 at Enterprise Boulevard in West Sacramento. However, this acquisition would not result in changes to community character or displacement of any residence, business, or employees.

Build Alternatives 2a and 2b would ultimately improve circulation along I-80/US-50 in the project corridor, which could result in improved access to nearby community facilities. Build Alternatives 2a and 2b would not adversely change the regional economy or locations of employment centers and would be expected to have a beneficial effect on the regional economy when completed, by improving access, travel time, and highway capacity. No businesses would be acquired or relocated and no changes to sales tax revenue or property values are anticipated within the regional study area. Build Alternatives 2a and 2b would not divide an existing neighborhood or result in additional barriers within the community study area, and there would be no adverse effects on community character and cohesion.

Build Alternatives 3a and 3b

Construction and Operation

Build Alternatives 3a and 3b would involve adding an HOT 2+ lane in each direction. While implementation of a tolling structure would result in congestion relief and enhanced accessibility, low-income travelers within the community may not realize the full benefit unless they take advantage of carpooling or high vehicle occupancy, as further described in Section 2.1.7, Environmental Justice. Build Alternatives 3a and 3b offer reduced or no payment options for riders in managed lanes who take advantage of carpooling or high vehicle occupancy. Build Alternatives 3a and 3b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 4a and 4b

Construction and Operation

Build Alternatives 4a and 4b would involve adding an HOT 3+ lane in each direction. While implementation of a tolling structure would result in congestion relief and enhanced accessibility, low-income travelers within the community may not realize the full benefit unless they take advantage of carpooling or high vehicle occupancy, as further described in Section 2.1.7, Environmental Justice. Build Alternatives 4a and 4b offer reduced or no payment options for riders in managed lanes who take advantage of carpooling or high vehicle occupancy. Build

Alternatives 4a and 4b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 5a and 5b

Construction and Operation

Build Alternatives 5a and 5b would involve adding an Express Lane in each direction. While implementation of a tolling structure would result in congestion relief and enhanced accessibility, low-income travelers within the community may not realize the full benefit and there would be no reduced payment option from carpooling or high vehicle occupancy, as further described in Section 2.1.7, Environmental Justice. Build Alternatives 5a and 5b offer no reduction in toll for ridesharing, carpooling, or other high vehicle occupancy and would affect lower-income individuals who cannot afford to pay a toll but would otherwise use the managed lanes for ridesharing and carpooling. Use of tolled lanes constitutes a higher financial burden on low-income travelers who choose to use the managed lanes than on higher-income individuals using the tolled lanes.

Build Alternatives 5a and 5b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 6a and 6b

Construction and Operation

Build Alternatives 6a and 6b would involve adding a transit-only lane in each direction. Build Alternatives 6a and 6b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 7a and 7b

Construction and Operation

Build Alternatives 7a and 7b would involve repurposing the current number one general purpose lane to HOV 2+. No new lanes would be constructed. Because Build Alternatives 7a and 7b would not add new lanes, but would repurpose existing lanes as managed lanes, the Build Alternatives 7a and 7b construction period may have shorter duration resulting in fewer delays than those under Build Alternatives 2a, 2b, 3a, 3b, 4a, 4b, 5a, 5b, 6a, and 6b. Otherwise, Build Alternatives 7a and 7b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effect would be similar to the effects described under Build Alternatives 2a and 2b.

2.1.6.4 Avoidance, Minimization, and/or Mitigation Measures

No AMMs or MMs are required.

2.1.7 Environmental Justice

2.1.7.1 Regulatory Setting

All projects involving a federal action (e.g., funding, permit, or land) must comply with Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, signed 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, the amount was $30,000 for a family of four (ASPE 2023).

All considerations under Title VI of the Civil Rights Act of 1964, and related statutes, have also been included in this project. Caltrans' 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.

2.1.7.2 Affected Environment

Information in this section is based on the CIA prepared for the project (Caltrans 2023a) and Caltrans' Title VI Policy Statement (Appendix B).

The community study area, which includes all census tracts and block groups immediately adjacent to the project footprint, consists of a variety of socioeconomic neighborhoods. The ethnic composition of the community study area, as described in Section 2.1.6 and summarized in Table 2.1-5, is similar in diversity to the regional study area. As described in Section 2.1.6, Community Character and Cohesion, and summarized in Table 2.1-9, median household income in the community study area is $71,216, similar to the regional study area of $71,717. According to the U.S. Census Bureau, which defines poverty thresholds by household income, size of family, and number of children, approximately 10.9 percent of families in the community study area are below the U.S. Census 2019 federal poverty level, which is a higher percentage than the regional study area (9.4 percent).

Environmental Justice Communities

For this analysis, environmental justice communities are defined consistently with the FHWA environmental justice strategy as areas that have concentrated populations of low-income and/or communities of color. The CEQ's Environmental Justice Guidance under NEPA (CEQ 1997) defines low-income populations using the annual poverty thresholds from the Census Bureau and minority populations as areas where the minority population exceeds 50 percent or the minority population percentage is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis (CEQ 1997). These guidelines were adopted for use at the national level and do not take into consideration income and population characteristics specific to California. California has a high cost of living, so the federal poverty level does not adequately capture households that experience poverty in California. The minority population has grown to half or more of the population in Sacramento and Yolo counties, and 45 percent of the region's population (SACOG 2019).

SACOG has defined environmental justice communities for the regional planning area, taking into consideration the differences in income and diversity unique to this region. SACOG has integrated those definitions into the RTP/SCS and the SACSIM traffic model, allowing for a robust analysis of changes in traffic patterns for environmental justice communities.

FHWA definitions for low-income and minority individuals are intended to be consistent with the definitions for EO 12898 that have been issued by CEQ and the EPA, with the following exceptions: FHWA defines low-income individuals using the poverty guidelines from the Department of Health and Human Services (DHHS) rather than U.S. Census Bureau, and the minority category of Native Hawaiian and Other Pacific Islander was added. The primary difference between the U.S. Census Bureau poverty thresholds and the DHHS poverty guidelines is the DHHS have geographic variation to account for the much higher costs of living in Alaska and Hawaii (Institute for Research on Poverty 2023).

To allow for a more dynamic analysis of project effects on environmental justice travelers and to provide consistency with the RTP/SCS and other regional planning documents, Caltrans has used the environmental justice community definitions from SACOG for this analysis.

Environmental justice communities within the regional study area are defined as follows:

- **Low-Income Communities:** Census tracts or block groups where 40 percent or more of the population earns 200 percent or less of the federal poverty level.
- **Minority Communities:** Census tracts or block groups where 70 percent or more of the population are Hispanic or Latino, Native Hawaiian or Other Asian Pacific Islander, Black or African American, American Indian and Alaska Native, or other non-white ethnic groups.

Approximately 39 percent of residents in the community study area (15 of 37 census block groups) live in defined environmental justice communities (SACOG 2019a).

The I-80 corridor is heavily used in Yolo County because it is the only west-east connector that crosses the Yolo Basin, which separates the cities of Davis and West Sacramento. In the larger regional picture, it is also the only west-east connector between the Bay Area and the city of Sacramento. Within the community study area, the percentage of individuals living below the poverty line (approximately 21.5 percent) is higher than the percentage of both the regional study area and California (13.5 and 13.4 percent, respectively).

Within the community study area, low-income, minority, and low-income/minority communities are in portions of downtown and south Davis, along I-80 and US-50 through most of West Sacramento, and near the US-50/I-5 interchange in Sacramento. The percentage of individuals living below the poverty line (approximately 21.5 percent) is higher than the percentage of both the Regional Study Area and California as a whole (13.5 and 13.4 percent, respectively). Table 2.1-9, included in Section 2.1.6, Community Character and Cohesion, identifies census block groups in the community study area that meet the SACOG income and minority criteria as environmental justice communities.

When evaluating transportation improvement effects on environmental justice communities, it is important to recognize that, on average, residents living in these communities walk, bicycle, and take transit at a higher rate than non-environmental justice households. Within the regional study area, transit use in environmental justice communities is more than twice the rate for non-environmental justice communities, and environmental justice communities have a 65 percent greater rate for walking and bicycling region-wide than non-environmental justice communities (SACOG 2019a). Vehicle availability contributes to this trend. Eleven percent of regional households in environmental justice communities do not have a vehicle compared to 4 percent in non-environmental justice communities. Although vehicle availability in environmental justice communities is less than in non-environmental justice communities, most environmental justice area residents still use personal vehicles for transportation. The existing and future infrastructure support of the transportation needs of these communities is a significant factor in their ability to access jobs, schools, services, and the effects on their overall health and quality of life (SACOG 2019a).

Table 2.1-15 and Table 2.1-16 provide existing daily I-80/US-50 traveler data by income and race/ethnicity for two freeway segments: I-80 at Yolo Causeway and US-50 at Sacramento River. These data are limited to those individuals who reside in the regional study area. As shown in the data, 22.6 to 23.3 percent of daily travelers had yearly incomes of less than $40,000, and minority community members represent between 46.7 and 50.2 percent of travelers using the freeway.

Residents living below the poverty level within the community study area walk, bicycle, and take transit at a higher rate than residents living above the poverty level. Within the regional study area, transit use in low-income communities is more than twice the rate than higher-income communities, and low-income communities have a 65 percent greater rate for walking and bicycling region-wide (SACOG 2019). In the Community Study Area, more workers in the Davis neighborhoods use public transportation or walk or bike to work than workers in other census tracts (Table 2.1-12), so these residents may have more options for public transit and alternative transportation modes than other areas.

Table 2.1-15. Travelers by Household Income in the Regional Study Area

Location	Household Income	Eastbound Travelers	Eastbound Percent of Travelers	Westbound Travelers	Westbound Percent of Travelers
I-80 at Yolo Causeway	$0 to $20,000	3,387	10.5%	3,456	10.3%
	$20,001 to $40,000	3,931	12.2%	4,149	12.3%
	$40,001 to $80,000	8,137	25.3%	8,735	25.9%
	$80,001 to $100,000	3,160	9.8%	3,277	9.7%
	>$100,000	13,583	42.2%	14,103	41.8%
	Total	32,198	100%	33,720	100%
US-50 at Sacramento River	$0 to $20,000	5,897	10.2%	5,611	10.1%
	$20,001 to $40,000	7,469	13.0%	7,334	13.2%
	$40,001 to $80,000	14,948	26.0%	14,587	26.2%
	$80,001 to $100,000	6,110	10.6%	5,807	10.4%
	>$100,000	23,190	40.3%	22,342	40.1%
	Total	57,614	100%	55,681	100%

Source: SACOG Replica model output provided by Caltrans (November 2020). Reported in I-80/ US-50 Travel Pattern Data Memorandum. February 10, 2021 (Fehr & Peers 2021a).
Notes: Number and percent of travelers has been filtered to those who had trips with their origin and destination within the SACOG region. Income values are assumed to be in 2019 dollars to match the model period.

Table 2.1-16. Travelers by Race and Ethnicity in Regional Study Area

Location	Race and Ethnicity	Eastbound Travelers	Eastbound Percent of Travelers	Westbound Travelers	Westbound Percent of Travelers
I-80 at Yolo Causeway	White, Not Hispanic or Latino Origin	17,169	53.3%	17,915	53.1%
	Hispanic or Latino Origin	7,124	22.1%	7,742	23.0%
	Asian, Not Hispanic or Latino Origin	4,569	14.2%	4,722	14.0%
	Black, Not Hispanic or Latino Origin	1,726	5.4%	1,704	5.1%
	Two or More Races, Not Hispanic or Latino Origin	1,179	3.7%	1,201	3.6%
	Native Hawaiian or Pacific Islander, Not Hispanic or Latino Origin	235	0.7%	233	0.7%
	American Indian or Alaskan Native, Not Hispanic or Latino Origin	104	0.3%	114	0.3%
	Some Other Race, Not Hispanic or Latino Origin	92	0.3%	89	0.3%
	Total	**32,198**	**100%**	**33,720**	**100%**
US-50 at Sacramento River	White, Not Hispanic or Latino Origin	28,707	49.8%	27,798	49.9%
	Hispanic or Latino Origin	13,489	23.4%	13,153	23.6%
	Asian, Not Hispanic or Latino Origin	8,390	14.6%	8,043	14.4%
	Black, Not Hispanic or Latino Origin	3,656	6.4%	3,450	6.2%
	Two or More Races, Not Hispanic or Latino Origin	2,318	4.0%	2,236	4.0%
	Native Hawaiian or Pacific Islander, Not Hispanic or Latino Origin	707	1.2%	675	1.2%
	American Indian or Alaskan Native, Not Hispanic or Latino Origin	183	0.3%	175	0.3%
	Some Other Race, Not Hispanic or Latino Origin	164	0.3%	151	0.3%
	Total	**57,614**	**100%**	**55,681**	**100%**

Source: SACOG Replica model output provided by Caltrans (November 2020). Reported in I-80/ US-50 Travel Pattern Data Memorandum. February 10, 2021 (Fehr & Peers 2021a).
Notes: Number and percent of travelers has been filtered to those who had trips with their origin and destination within the SACOG region.

2.1.7.3 Environmental Consequences

The environmental justice analysis in this section examines whether minority and/or low-income populations in the project area would experience disproportionately high and adverse effects and whether the improvements would benefit low-income and minority communities equitably. FHWA Order 6640.23A defines an adverse effect as one that:

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

In determining whether an environmental justice community would experience disproportionately adverse effects or whether impacts are predominantly borne by an environmental justice community, the analysis considers the change in the roadway capacity, traffic, congestion, travel times, travel cost, and facility footprint, and the resulting direct and indirect effects on the human and natural environment, both short-term construction impacts and on-going effects associated with management and operations of the project. This project was analyzed for potential for property acquisitions and relocations in environmental justice communities; effects on environmental justice neighborhood cohesion; and changes in noise, air quality, and visual conditions in environmental justice communities attributable to the construction and operation of that project.

No Build Alternative 1

Construction and Operation

Under No Build Alternative 1, managed lanes and transportation improvements would not be constructed or operated. As such, the No Build Alternative 1 would have no effect on environmental justice communities.

Build Alternatives 2a and 2b

Construction

Build Alternatives 2a and 2b would involve adding an HOV 2+ lane in each direction. Build Alternatives 2a and 2b would occur primarily within the existing Caltrans right-of-way, but it would require one permanent right-of-way easement outside the existing Caltrans right-of-way within census tract 102.03, an environmental justice community. Under all Build Alternatives, Caltrans would acquire right-of-way to construct a Park-and-Ride Facility with approximately 300 parking spaces on the east side of Enterprise Boulevard. The subject parcel is currently vacant, and the new facility would be located partially within and partially outside of the existing Caltrans right-of-way. Surrounding land uses include highway service commercial uses such as restaurants and gas stations. The development of the Park-and-Ride Facility would be consistent with existing land uses and would not displace minority or low-income residents, businesses, or employees. There would be no disruption or adverse effect on existing land uses or community members in the surrounding areas. The Park-and-Ride facility area have been largely undeveloped. Historical aerial photographs on google earth and historical USGS topographic maps available online show that a road was located on the site from at least 1967 through 2002. The access to I-80 continued across Enterprise Boulevard, across the south-central portion of the site, and connected with Lake Road. The current google maps aerial photo shows the southern portion of the site is being used as a staging area for construction across Lake Road. No other development is identified on the site dating back to 1948 (Google Earth Pro 2023) The Park-and-Ride Facility would not result in changes to land uses, acquisition of residential or commercial property, or displacement of any minority residence, business, or employees.

Since households in environmental justice communities generally have fewer vehicles than households in non-environmental justice communities, the benefits of the Build Alternatives may not be realized by environmental justice community members who do not own a vehicle. However, ITS and auxiliary lane improvements with all Build Alternatives would help facilitate circulation between I-80 and the surrounding surface streets, benefiting environmental justice community members using bus and transit service entering and exiting the highway.

As described in Section 2.1.6, Community Character and Cohesion, project impacts on air quality, noise, and visual resources can affect community character for environmental justice communities and non-environmental justice communities. The severity of these community impacts is a function of proximity to the highway facility. Communities adjacent to highways in the regional study area and community study area are a mix of environmental justice and non-environmental justice neighborhoods.

As discussed in Section 2.2.7, Noise, the noise study completed for the project (Illingworth and Rodkin 2022) concluded that future noise levels along I-80 under the Build Alternatives would increase from 0 to +2 A-weighted decibels (dBA) at all receptors when compared to existing conditions. This modest increase in noise would not substantially affect adjacent communities and would not disproportionately affect community character or quality of life in environmental justice communities compared to non-environmental justice communities, nor would it be predominantly borne by environmental justice communities in the community study area.

Travel lanes would move closer to neighboring properties along some segments and could increase traffic noise. This widening to the outside occurs within an environmental justice community (census tract 106.02 block group 4). Adjacent land uses include a small area of multi-family residential development including a mobile home park, Olive Court (an affordable housing community), and the Arbors (apartment complex). The noise study indicates that future noise levels would increase from 0 to +2 dBA at the sensitive receptors located in this environmental justice community because of this Project by the 2049 horizon year, when compared to existing conditions and also when compared to the No-Build alternative. A sound wall, mature trees, and vegetation are located between I-80 and these residential properties, creating a buffer for noise impacts. This modest increase in noise would not substantially affect community character or quality of life in environmental justice communities compared to non-environmental justice communities.

As noted in Section 2.2.6, Air Quality, the air quality analysis completed for the project (Caltrans 2023c) determined that the Build Alternatives would not substantially change the traffic mix and future emissions for all pollutants except fugitive particulate matter are expected to be lower than present levels. Fugitive particulate matter emitted is proportional to changes in VMT, so each alternative differs in its relative change in emission levels. Therefore, the Build Alternatives would not increase the pollution burden on neighboring environmental justice communities in the long term.

As noted in Section 2.2.11, Visual and Aesthetics, the visual impact analysis completed for the project (Stantec 2022) concluded that the Build Alternatives would affect the visual environmental of the corridor by removing center median functional plantings, increasing paved surfaces, and adding barriers and fencing, new roadway structures, new overhead and roadside signs, lighting, a Park-and-Ride Facility, and ITS elements, all of which collectively would result in an increasingly urbanized aesthetic. Both environmental justice and non-environmental justice communities that front the highway would be affected by these visual impacts. The resulting effect of these visual changes on community character would be modest. This impact is not appreciably more severe in environmental justice communities than the non-environmental justice communities nor predominantly borne by environmental justice communities in the community study area.

Construction activities would result in delays for roadway users and potentially affect access to surrounding businesses and community facilities. In particular, Build Alternative 2b would result in a longer construction timeline in order to build the I-80 connector structure, thus the effects of construction would be longer than Build Alternative 2a. Construction activities and ground-disturbing activities would result in temporary visual effects; increased noise levels; and increased air pollutants such as dust and particulate matter due to the excavation, grading, hauling, and other construction-related activities. This impact is not appreciably more severe in environmental justice communities than the non-environmental justice communities nor predominantly borne by environmental justice communities in the community study area.

A TMP (Standard Measure TT-3) would be developed by Caltrans during the design phase. Additionally, the contractor would implement a planned public outreach program to keep area residents, businesses, emergency service providers, and transit operators informed of the project construction schedule as part of Standard Measure COM-1. Build Alternatives 2a and 2b would also implement visual, noise, and air quality standard measures. Therefore, Build Alternatives 2a and 2b would not cause disproportionately high and adverse direct effects on environmental justice communities during construction nor create impacts that are predominantly borne by environmental justice communities in the community study area.

Operation

Build Alternatives 2a and 2b would occur primarily within the existing Caltrans right-of-way, but would require one permanent right-of-way easement outside the existing Caltrans right-of-way within census tract 102.03, an environmental justice community. Under Build Alternatives 2a and 2b, Caltrans would acquire 2.8 acres of right-of-way to construct a Park-and-Ride Facility with approximately 300 parking spaces on the east side of Enterprise Boulevard. The subject parcel is currently vacant, and the new facility would be partially outside the existing Caltrans right-of-way. Surrounding land uses include highway service commercial uses such as restaurants and gas stations.

Improved traffic flow and movement of persons on I-80/US-50 within the project limits would benefit a wide range of communities including those defined as environmental justice communities. With the lane addition on I-80 and US-50 under Build Alternative 2a, the volume of vehicles and persons moved through the corridor during peak commute hours would increase compared to Alternative 1 (No Build). Despite the added capacity, congested conditions would still be expected in both directions during peak hours. Under Build Alternatives 2a and 2b, which would add a managed HOV 2+ lane in each direction would not impose tolls on travelers, so the benefits of these alternatives would be equally shared by travelers of all income levels. Additionally, the inclusion of VMT mitigation that includes transit and rail improvements would provide alternative modes of transportation and route flexibility, and transit pass subsidies and reduced fares that would benefit EJ communities.

Build Alternatives 3a and 3b

Construction

Build Alternatives 3a and 3b are within the same project area as Build Alternatives 2a and 2b, respectively and would have the same construction-related effects.

Operation

Build Alternatives 3a and 3b would involve adding an HOT 2+ lane in each direction, which would introduce a toll structure. Since the congestion relief and enhanced accessibility associated with the project would benefit all I-80/US-50 travelers, there is no disproportionate adverse effect on environmental justice travelers for all Build Alternatives. Environmental justice communities may not realize the full benefit from alternatives that include tolling due to cost. Use of toll lanes (Alternatives 3 through 5) by environmental justice (low-income) travelers would cause a higher financial burden that is predominantly borne by environmental justice communities and may be considered a disproportionate impact. Caltrans has adopted AMMs to reduce potential adverse effects on low-income drivers. Caltrans' future-appointed tolling authority would be required to implement a tolling program in alignment with Caltrans Deputy Directive 43-R1. This represents a reduction in the receipt of benefits by low-income groups under tolling alternatives and an inequitable distribution of project benefit. With implementation of AMMs EJ-1, EJ-2, and EJ-3, and VMT mitigation that includes transit and rail improvements, Build Alternatives 3a and 3b would not cause disproportionately high and adverse direct effects on environmental justice communities.

Build Alternatives 4a and 4b

Construction

Build Alternatives 4a and 4b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effect on existing environmental justice communities in the surrounding areas would have the same as effects described under Build Alternatives 2a and 2b.

Operation

Build Alternatives 4a and 4b would involve adding an HOT 3+ lane in each direction. As Build Alternatives 4a and 4b are toll-based alternatives; effects on environmental justice travelers would be similar to Build Alternatives 3a and 3b. With implementation of AMMs EJ-1, EJ-2, and EJ-3, Build Alternatives 4a and 4b would not cause disproportionately high and adverse direct effects on environmental justice communities.

Build Alternatives 5a and 5b

Construction

Build Alternatives 5a and 5b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effect on environmental justice communities in the surrounding areas would have the same as construction-related effects described under Build Alternatives 2a and 2b.

Operation

Build Alternatives 5a and 5b would involve adding an Express Lane in each direction. As Build Alternatives 5a and 5b are also toll-based alternatives, effects on Environmental Justice Travelers would be similar to Build Alternatives 3a and 3b, respectively. However, there would be no reduced payment option from carpooling or high vehicle occupancy. With implementation of AMMs EJ-1, EJ-2, and EJ-3 Build Alternatives 5a and 5b would not cause disproportionately high and adverse direct effects on environmental justice communities.

Build Alternatives 6a and 6b

Construction

Build Alternatives 6a and 6b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effect on environmental justice communities in the surrounding areas would be the same as construction-related effects described under Build Alternatives 2a and 2b.

Operation

Build Alternatives 6a and 6b would add a transit-only lane in each direction. This transit-only alternative would improve traffic flow and movement of persons on I-80/US-50 within the project limits which would benefit a wide range of communities, including those defined as environmental justice communities. Build Alternatives 6a and 6b would not impose tolls on travelers, so the benefits of these alternatives would be equally shared by travelers of all income levels.

Build Alternatives 7a and 7b

Construction

Build Alternatives 7a and 7b would involve repurposing the current number one general purpose lane to HOV 2+. No new lanes would be constructed and proposed work would mostly be limited to restriping. Build Alternative 7b would construct the I-80 managed lane connector structure, providing a direct connection of the managed lanes via a managed lanes connector ramp over US-50 at the I-80/US-50 Interchange. A TMP (Standard Measure TT-3) would be developed by Caltrans during the design phase. Additionally, the contractor would implement a planned public outreach program to keep area residents, businesses, emergency service providers, and transit operators informed of the Project construction schedule as part of Standard Measure COM-1. Further, Build Alternatives 7a and 7b would also implement visual, noise, and air quality standard measures. Therefore, Build Alternatives 7a and 7b would not cause disproportionately high and adverse direct effects on environmental justice communities during construction.

Operation

Build Alternatives 7a and 7b would involve repurposing the current number one general purpose lane to HOV 2+. As a described under Build Alternatives 2a and 2b, with the addition of a managed HOV 2+ lane in each direction that would not impose tolls on travelers, the benefits of these alternatives would be equally shared by travelers of all income levels.

2.1.7.4 Avoidance, Minimization, and/or Mitigation Measures

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

With the inclusion of the following AMMs, the project will not result in adverse impacts: Build Alternatives 3a, 3b, 4a, 4b, 5a, and 5b. If Build Alternative 3a, 3b, 4a, 4b, 5a, or 5b is selected as the preferred alternative, the California Transportation Commission would authorize a tolling authority to operate the toll lanes. In part, the tolling authority’s role would be to realize travel benefits from lane pricing to all travelers on I-80/US 50, including environmental justice communities who may not realize the cost-benefit of time savings associated with a tolled lane. The future tolling authority, at the direction of Caltrans, will include a tolling program that offers, but is not limited to, the following strategies to offset the effects of toll lane alternatives on environmental justice travelers.

- **AMM EJ-1 (Build Alternatives 3a, 3b, 4a, 4b, 5a, and 5b)**: Caltrans would establish a variable pricing for express lanes or provide discounted per-mile tolls, credits, rebates and/or exemptions based on income levels and cost of living.

- **AMM EJ-2 (Build Alternatives 3a, 3b, 4a, 4b, 5a, and 5b)**: Caltrans would offset the financial burden of enrolling in electronic tolling program. The toll authority would improve methods for environmental justice communities and other users to obtain toll tags/transponders. For example, the toll authority would provide that drivers without a credit card or bank account can receive toll tags, waive or redefine the monthly minimum balance requirements for low-income users. and provide translation services to community travelers with Limited English Proficiency (LEP).

- **AMM EJ-3 (Build Alternatives 3a, 3b, 4a, 4b, 5a, and 5b)**: Caltrans would use no less than 50 percent of excess toll revenue to improve multi-modal transit, expand transportation choice, and other transportation improvements that would distribute benefits to environmental justice communities identified in this report.

2.1.8 Equity

2.1.8.1 Regulatory Setting

Equity in transportation seeks fairness in mobility and accessibility to meet the needs of all community members. A central goal of transportation equity is to facilitate social and economic opportunities by providing equitable levels of access to affordable and reliable transportation options based on the needs of the populations being served, particularly populations that are traditionally underserved. It is important to note that transportation equity does not mean equal. An equitable transportation plan considers the circumstances impacting a community's mobility and connectivity needs, and this information is used to determine the measures needed to develop an equitable transportation network (U.S. Department of Transportation 2022a, 2022b).

Equity is related to environmental justice, discussed in the previous section, but is more broadly defined. Recent laws and policies have been adopted regarding equity and the consideration of how past policies and plans have resulted in disparities for underserved and disadvantaged populations.

Executive Order 13985. EO 13985, *Advancing Racial Equity and Support for Underserved Communities Through the Federal Government* (2021), affirms that “the Federal Government should pursue a comprehensive approach to advancing equity for all, including people of color and others who have been historically underserved, marginalized, and adversely affected by persistent poverty and inequality. Affirmatively advancing equity, civil rights, racial justice, and equal opportunity is the responsibility of the whole of our Government.” Under EO 13985, the term “equity” means the consistent and systematic fair, just, and impartial treatment of all individuals, including individuals who belong to underserved communities that have been denied such treatment, such as Black, Latino, and Indigenous and Native American persons, Asian Americans and Pacific Islanders and other persons of color; members of religious minorities; lesbian, gay, bisexual, transgender, and queer persons; persons with disabilities; persons who live in rural areas; and persons otherwise adversely affected by persistent poverty or inequality. The term “underserved communities” refers to populations sharing a particular characteristic, as well as geographic communities, that have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life. The EO seeks to advance equity through various efforts, including coordinating across the federal government, identifying methods to assess equity, conducting an equity assessment in federal agencies, allocating federal resources to advance fairness and opportunity, promoting equitable delivery of government benefits and equitable opportunities, engaging with members of underserved communities, and establishing an Equitable Data Working Group.

USDOT Equity and Access Policy. The U.S. Department of Transportation's March 2021 Equity and Access Policy Statement (USDOT 2021) states that "the Department is committed to promoting equitable delivery of government benefits and opportunities, including advancing meaningful engagement with all communities and ensuring that government contracting and procurement opportunities are available on an equal basis to all eligible providers of goods and services." The policy statement reiterates USDOT's commitment to incorporate environmental justice and equity principles into transportation planning and decision-making processes, including ensuring full and equitable access to programs, activities, and services for persons with limited English proficiency in accordance with Executive Order 13166 *Improving Access to Services for Persons with Limited English Proficiency*.

Caltrans Equity Statement. The Caltrans Equity Statement (December 10, 2020) acknowledges that communities of color and underserved communities have experienced fewer benefits and a greater share of negative impacts associated with our state's transportation system. Some of these disparities reflect a history of transportation decision-making, policy, processes, planning, design, and construction that "quite literally put up barriers, divided communities, and amplified racial inequities, particularly in our Black and Brown neighborhoods."

Local Agency Equity Policies and Programs. Local governments are also addressing equity in their policies and programs. Yolo County established their Inclusion and Diversity Work Group in 2019 with a goal of creating and sustaining an equitable work environment and prioritizing services to underserved communities (Yolo County 2022).The City of West Sacramento recently created a sidewalks and transportation equity program, which will review and prioritize projects with a "lens of equity" by focusing on benefits for disadvantaged communities, seniors, and providing safe routes to schools and parks (City of West Sacramento 2022). The City of Sacramento established their Office of Diversity and Equity in July 2018 with the mission of creating "a more equitable and inclusive City of Sacramento by facilitating the integration of greater representation, fairness, belonging and care into our policies, protocols, practices and work-places" (City of Sacramento 2022). In February 2021, Sacramento County approved a Resolution on Racial Equity and Social Justice, declaring racism a public health crisis (Sacramento County 2021). Solano County's Equity and Diversity Committee is working to improve health services for underserved populations (Solano County 2022).

2.1.8.2 Affected Environment

Information in this section is based on the CIA prepared for the project (Caltrans 2023a).

To help identify communities that are disproportionately burdened by multiple sources of pollution and with population characteristics that make them more sensitive to pollution, the California Office of Environmental Health Hazards Assessment developed the CalEnviroScreen mapping tool. CalEnviroScreen identifies communities facing socioeconomic disadvantages or health disadvantages.

The California Environmental Protection Agency has defined disadvantaged communities as those census tracts that fall in or above the 75th percentile in CalEnviroScreen. Census tracts with the highest CalEnviroScreen score along the I-80/US-50 corridor are concentrated in West Sacramento and near the US-50/I-5 interchange in Sacramento, where the pollution burden percentiles and population characteristic percentiles combine for an overall score of 75 percent or greater. The *I-80/US-50 Travel Pattern Data Memorandum* prepared for the project (Fehr & Peers 2021a) summarizes available data on existing travel patterns for the I-80/US-50 corridor, including use by environmental justice community members.

When identifying underserved and disadvantaged communities in the study area, the CIA for the project considers historic impacts from transportation infrastructure development, existing environmental conditions and pollution burdens, health disparities that make communities more sensitive to pollution, and other socioeconomic factors that correlate with sensitivity to environmental impacts and traditionally underserved communities.

To help identify communities that are disproportionately burdened by multiple sources of pollution and with population characteristics that make them more sensitive to pollution, the California Office of Environmental Health Hazards Assessment developed the CalEnviroScreen mapping tool (OEHHA 2021). The CalEnviroScreen mapping tool identifies communities facing socioeconomic disadvantages or health disadvantages. It uses environmental, health, and socioeconomic data from state and federal government sources to score every census track in California. The scores are generated using statewide indicators in four categories: pollution exposures, environmental effects, sensitive populations, and socioeconomic factors. CalEnviroScreen ranks census tracts (low to high sensitivity) based on their combined pollution burden and population characteristics; a percentile is then calculated from the ordered values.

The California Environmental Protection Agency has defined disadvantaged communities as those census tracts that fall in or above the 75th percentile in CalEnviroScreen, meaning the combined score is higher than 75% of the census tracts in California. Census tracts with the highest CalEnviroScreen score along the I-80/US-50 corridor are concentrated in West Sacramento, where the pollution burden percentiles and population characteristic percentiles combine for an overall score in the 75th percentile when compared to census tracts in the state. This ranking indicates that these tracts are confronted with many burdens and vulnerabilities from environmental pollutants and are defined as disadvantaged communities. Within segment 3 (I-80/US-50 to Jefferson Boulevard and Jefferson Boulevard to I-5), CalEnviroScreen scores fall within the 66th to 96th percentile, indicating that these communities have a high pollution burden and/or high sensitivity.

2.1.8.3 Environmental Consequences

The environmental consequences of the proposed alternatives are evaluated for their potential to adversely affect underserved and disadvantaged communities through changes in the human and natural environment. Project effects on communities can include changes in pollution burdens, modifications to community character, and exacerbation of historical impacts from transportation infrastructure (e.g., divided communities). Section 2.1.7, Environmental Justice, describes localized changes in air quality, noise, and visual resources in underserved communities; evaluates whether minority and/or low-income populations experience disproportionately adverse effects; and provides conclusions.

No Build Alternative 1

Construction and Operation

The No-Build Alternative 1 would not adversely affect underserved and disadvantaged communities through community disturbance, or tolls. The No-Build Alternative 1 would not provide the travel benefits of the Build Alternatives. As such, the No-Build Alternative 1 would have no effect on equity.

Build Alternatives 2a and 2b

Construction

Construction activities under Build Alternative 2a and 2b would result in short-term changes in access, circulation, light/glare noise, and air quality. Intermittent and temporary ramp and lane closures would inconvenience all roadway users and could require alternative traffic routing. Neighboring residents and businesses may experience short-term noise, fugitive dust, and light/glare from construction activities.

As discussed in Section 2.1.11, temporary sources of light and glare would be added to the project area during the construction phase; however, they would be minimized through use of standard construction equipment, protocols, and appropriate light and glare screening measures, including Standard Measure AR-4 and AMM AES-1, which would limit construction lighting and avoid or minimize glare through selection of materials and finishes, respectively.

However, these construction activities would be short-term and implementation of Standard Measures AR-2, AR-4, GHG-1 through GHG-6, TT-1 through TT-3 (see Appendix D), and AMMs NOI-1 through NOI-6, would help to minimize and reduce potential effects resulting from construction activities. Therefore, Build Alternatives 2a and 2b would not cause disproportionately high and adverse direct effects on underserved and disadvantaged communities through changes in the human and natural environment during construction.

Operation

Build Alternatives 2a and 2b would occur primarily within the existing Caltrans right-of-way. Build Alternatives 2a and 2b would construct a new Park-and-Ride Facility on a vacant parcel south of I-80 at Enterprise Boulevard in West Sacramento, in a traditionally underserved community. The Park-and-Ride Facility would not result in changes to land uses, acquisition of residential or commercial property, or displacement of any minority residence, business, or employees. No residential or business acquisitions in underserved communities would occur. Build Alternatives 2a and 2b would not divide communities. Build Alternatives 2a and 2b would not contribute to the historical division of the West Sacramento area that occurred with the construction of I-80 in the 1970s, but the added lanes within the existing I-80 corridor would not further divide the community nor remedy those historical divisions.

Noise from highway operations can influence community character and burden sensitive populations. Although Build Alternatives 2a and 2b would increase capacity and operational traffic, they would not change the traffic mix nor move major roadways closer to sensitive receptors. As discussed in Sections 2.1.6 and 2.1.7, the noise study for the project concluded that future noise levels along I-80 would increase from 0 to +2 dBA under Build Alternatives 2a and 2b. This modest increase in noise would be barely perceptible and would not substantially affect adjacent communities nor disproportionately affect community character or quality of life in underserved communities in the study area.

Vehicular air pollution and health disparities associated with those air pollutants (including asthma, cardiovascular disease, and low birth weight) are disproportionately borne by residents who live near major highways in California (Union of Concerned Scientists 2019). Traffic is a significant source of air pollution, particularly in urban areas, where more than 50 percent of particulate emissions come from traffic (OEHHA 2021). Exhaust from vehicles also contains toxic chemicals, including nitrogen oxides, carbon monoxide, and benzene. When determining whether the project would affect communities already burdened by air pollution and associated health risks, the analysis of projected air quality conditions was used. Air pollution emissions for eight out of nine toxic chemicals, are predicted to be lower in future years under the Build Alternatives than present levels (Caltrans 2023c). This is primarily a function of improved emission standards and the shift to more electric vehicles in future years rather than changes in traffic operations under the Build Alternatives. Although future emissions would be lower under all alternatives, the amount of fugitive particulate matter emitted with the No-Build and Build Alternatives is proportional to changes in VMT, so each alternative differs in its relative reduction in future emission levels. Build Alternatives 2a and 2b would increase future VMT, but would not significantly exacerbate air pollutant conditions compared to existing conditions and would not significantly exacerbate conditions compared to the future No-Build Alternative for nearby underserved communities and communities with associated health disparities. How changes in air pollutants affect health outcomes for communities that already have high pollutant burdens is difficult to predict. As noted by FHWA (2023), "While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited." Because of the limitations in the methodologies for forecasting health impacts, predicted differences in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts (FHWA 2023).

Additionally, as part of the transportation conformity process for particulate matter, an interagency committee that includes the FHWA, Federal Transit Administration, and USEPA found the Project not to be a project of air quality concern. The Air Quality Report (Caltrans 2023b) concludes that Build Alternative 2a and 2b would not substantially increase the pollution burden on neighboring communities in the long term when compared to the No-Build condition.

Overall, Build Alternatives 2a and 2b would not significantly exacerbate air pollutant conditions for nearby underserved communities and communities with associated health disparities.

Visual changes would also influence community character in adjacent underserved communities. The project proposes to increase the amount of paving within the existing width of the freeway, introduce new overhead signage elements, and remove median plantings and roadside trees that provide visual buffering. These changes would have a notable visual impact that is apparent to both highway users and highway neighbors, including the surrounding community. While visual changes for neighboring communities would be more modest than changes experienced by highway users, Build Alternatives 2a and 2b may increase the dominance of the transportation facility in neighboring viewsheds, further degrading the existing visual condition for disadvantaged communities adjacent to the highway.

Build Alternatives 2a and 2b would improve traffic conditions for highway users, including members of underserved and disadvantaged communities. See Section 2.1.7, Environmental Justice, for an analysis of tolling and low-income populations. Build Alternatives 2a and 2b would not cause disproportionately high and adverse direct effects on underserved and disadvantaged communities through changes in the human and natural environments.

Build Alternatives 3a and 3b

Construction

Build Alternatives 3a and 3b are within the same project area as Build Alternatives 2a and 2b, respectively, and would have the same construction-related effects.

Operation

Build Alternatives 3a and 3b would involve adding an HOT 2+ lane in each direction, which would introduce a toll structure. Tolled lane options would introduce new signage that may present challenges for linguistically isolated households. Only one census block in the community study area in West Sacramento has a high proportion of households where no one over the age of 14 speaks English. Residents in these neighborhoods may be initially challenged by the toll-related signage and the process for obtaining toll transponders. Standard Measure EQ-1 would require If a tolled lane option (Alternatives 3a, 3b, 4a, 4b, 5a, or 5b) is selected as the preferred alternative, Caltrans' future-appointed tolling authority would be required to implement a tolling program in alignment with Caltrans Language Access Plan (2020) and Deputy Directive 91-R2, which would accommodate use of toll lane options by limited English proficiency community members. Caltrans 2020 Language Access Plan lays out reasonable steps to provide limited English proficiency individuals with meaningful access to all Caltrans activities, including the provision of translation and interpretation services to the public. The tolling authority would adhere to these policies. Providing instructions in multiple languages would help offset this burden, and linguistically isolated households are likely to adapt to the new signage and lane operations over time. Build Alternatives 3a and 3b would not cause disproportionately high and adverse direct effects on underserved and disadvantaged communities through changes in the human and natural environments.

Build Alternatives 4a and 4b

Construction

Build Alternatives 4a and 4b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effect on existing environmental justice communities in the surrounding areas would be the same as effects described under Build Alternatives 2a and 2b.

Operation

Build Alternatives 4a and 4b would involve adding an HOT 3+ lane in each direction. As discussed in Section 2.1.7, as Build Alternatives 4a and 4b are toll-based alternatives, effects on environmental justice travelers would be similar to Build Alternatives 3a and 3b. Standard Measure EQ-1 would be implemented Build Alternatives 4a and 4b. Build Alternatives 4a and 4b would not cause disproportionately high and adverse direct effects on underserved and disadvantaged communities through changes in the human and natural environments.

Build Alternatives 5a and 5b

Construction

Build Alternatives 5a and 5b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effect on environmental justice communities in the surrounding areas would be the same as construction-related effects described under Build Alternatives 2a and 2b.

Operation

Build Alternatives 5a and 5b would involve adding an Express Lane in each direction. As discussed in Section 2.1.7, as Build Alternatives 5a and 5b are also toll-based alternatives, effects on environmental justice travelers would be similar to Build Alternatives 3a and 3b, respectively. Standard Measure EQ-1 would be implemented Build Alternatives 5a and 5b. Build Alternatives 5a and 5b would not cause disproportionately high and adverse direct effects on underserved and disadvantaged communities through changes in the human and natural environments.

Build Alternatives 6a and 6b

Construction

Build Alternatives 6a and 6b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effect on environmental justice communities in the surrounding areas would be the same as construction-related effects described under Build Alternatives 2a and 2b.

Operation

Build Alternatives 6a and 6b would add a transit-only lane in each direction, which could benefit underserved communities that use transit at a higher rate than other communities. However, Build Alternative 6a and 6b do not substantially improve overall traffic conditions for all highway users. Refer to Section 2.1.10, Traffic and Transportation, for more information. Standard Measure EQ-1 would be used under Build Alternatives 6a and 6b. Build Alternatives 6a and 6b would not cause disproportionately high and adverse direct effects on underserved and disadvantaged communities through changes in the human and natural environments.

Build Alternatives 7a and 7b

Construction

Build Alternatives 7a and 7b would involve repurposing the current number one general purpose lane to HOV 2+. No new lanes would be constructed, and proposed work would mostly be limited to restriping. Build Alternative 7b would construct the I-80 managed lane connector structure, providing a direct connection of the managed lanes by flying over US-50 at the I-80/US-50 Interchange. A TMP (Standard Measure TT-3) would be developed by Caltrans during the design phase. Additionally, the contractor would implement a planned public outreach program to keep area residents, businesses, emergency service providers, and transit operators informed of the project construction schedule as part of Standard Measure COM-1. Further, Build Alternatives 7a and 7b would also implement visual, noise, and air quality standard measures. Therefore, Build Alternatives 7a and 7b would not cause disproportionately high and adverse direct effects on underserved and disadvantaged communities through changes in the human and natural environments.

Operation

Build Alternatives 7a and 7b would involve repurposing the current number one general purpose lane to HOV 2+. As described under Build Alternatives 2a and 2b, with the addition of a managed HOV 2+ lane in each direction without tolls, impacts would be similar to Build Alternatives 2a and 2b. Standard Measure EQ-1 would be used under Build Alternatives 7a and 7b.

2.1.8.4 Avoidance, Minimization, and/or Mitigation Measures

Based on the above discussion and analysis, the Build Alternatives would not substantially change existing conditions for neighboring underserved and disadvantaged populations. The project would not increase pollution burdens or divide or disrupt existing neighborhoods.

2.1.9 Utilities and Emergency Services

2.1.9.1 Affected Environment

Information in this section is based on the CIA prepared for the project (Caltrans 2023a).

Utilities

There are utility companies with facilities in the project area, including AT&T (fiber-optics/telecommunications provider) and PG&E (electrical and natural gas provider). Additionally, there may be aboveground or underground utilities related to telecommunications, public works, sewer services, water services, and other utility services.

Emergency Services

I-80 and US-50 in the project corridor pass through numerous jurisdictions; therefore, emergency response services are provided by various agencies. In Solano County, emergency services are provided by the County Sheriff's office and Office of Emergency Services (OES). In the city of Davis, the Davis Fire Department provides pre-hospital emergency medical services and responds to fires, hazardous materials incidents, natural disasters, and other emergencies. The Davis Police Department and UC Davis Police Department provide law enforcement. The Yolo County OES is the emergency management agency for Yolo County and coordinates the county government's response to disaster or other large-scale emergencies. The Yolo Emergency Medical Services Agency provides emergency medical care.

The West Sacramento Fire Department serves as emergency management coordinator for the city of West Sacramento and works with other city departments, the Yolo County OES, and surrounding jurisdictions. The West Sacramento Police Department provides law enforcement and emergency services. The Sacramento Fire Department is responsible for the management of fire operations within the city of Sacramento during emergency responses. The Fire Department coordinates all responses through the Sacramento Regional Fire Emergency Communication Center. Fire services also include the provision of emergency medical service and life-saving medical care. The Sacramento Police Department is responsible for law enforcement operations and terrorism prevention within the city.

In addition to its use by emergency responders, US-50 and I-80 are dedicated evacuation routes in Yolo and Sacramento counties. Yolo County's OES and the City of West Sacramento's Emergency Management division have identified evacuation zones and routes for given neighborhoods. The City of Sacramento also has prepared detailed maps showing hypothetical levee breaks at various locations for a 200-year event and recommended flood evacuation routes (City of Sacramento Department of Utilities 2021). I-80 and US-50 are identified evacuation routes on the Yolo County evacuation zone maps and under many levee break scenarios for the city of Sacramento. I-80 is a critical route for the West Sacramento area.

2.1.9.2 Environmental Consequences

No Build Alternative 1

Construction and Operation

Under No Build Alternative 1, managed lanes and transportation improvements would not be constructed or operated. As such, the No Build Alternative would have no effect on emergency services or utilities.

Build Alternatives 2a and 2b

Construction

__Utilities__

Build Alternatives 2a and 2b would not result in potential conflicts with existing utilities that are present along the I-80/US-50 corridor. Utility companies would require verification of facilities and involvement in construction plans. Accordingly, prior to construction, an estimated 15 test hole sites would be drilled at eight different locations for natural gas lines running transversely underneath I-80, the Yolo Causeway, and West Capitol Avenue in Sacramento, where the new managed lane would be constructed with retaining walls and columns. Positive findings would verify whether the gas line would require relocation or how to redesign to avoid conflicts with existing utilities.

Caltrans would provide verification and notify utilities of proposed construction work in accordance with Standard Measure UE-2. Under Build Alternative 2b, up to four 115-kilovolt overhead utility towers may need to be relocated or the tower height increased near the new I-80 connector structure at the I-80/US-50 separation in West Sacramento. As such, AMM AES-5 would be implemented to minimize the prominence, scale, and mass and avoid the need to raise/relocate adjacent powerline towers.

Build Alternatives 2a and 2b also would include installation of a fiber-optic cable line and associated fiber-optic splice boxes within the roadbed at the eastbound outside shoulder of I-80 from Pedrick Road in Solano County at about Post Mile (PM) 40.7 to PM 4.35 in Yolo County. Fiber-optic cable may also be placed via directional borings and to avoid conflicts with existing utilities.

As described, Standard Measure UE-2 would require coordination of utility conflicts, relocation, and cable protection so disruption of utility service would be minimized. Therefore, Build Alternatives 2a and 2b would not result in an adverse effect on utilities.

Operation

__Utilities__

Once constructed, there would be no project-related changes to utilities in the project area. Therefore, Build Alternatives 2a and 2b would not result in an adverse effect on utilities.

Construction

__Emergency Services__

Temporary traffic delays and ramp closures on I-80/US-50 during construction of Build Alternatives 2a and 2b could result in temporary delays in emergency services.

As described in Section 2.1.6, Community Character and Cohesion, to help ensure emergency services are maintained during construction, Standard Measure TT-3, Traffic Management Plan, would be developed by Caltrans consistent with Caltrans' standard procedures to maintain access for emergency services throughout all phases of construction. The TMP would include elements such as traffic controls to minimize speeds/congestion and other measures to maintain access for police, fire, and medical services along I-80/US-50 in the project area during construction. Additionally, Standard Measure UE-1 would require that all emergency response agencies in the project area would be notified of the project construction schedule and would have access to I-80 and US 50 throughout the construction period.

Operation

Emergency Services

Once constructed, Build Alternatives 2a and 2b would improve circulation and reduce congestion along I-80/US-50 in the project corridor, which would result in improved emergency service access and response times. Therefore, Build Alternatives 2a and 2b would not result in an adverse effect on emergency services.

Build Alternatives 3a and 3b

Construction and Operation

Build Alternatives 3a and 3b would involve adding an HOT 2+ lane in each direction. Build Alternatives 3a and 3b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effect would be the same as effects on utilities and emergency services as described under Build Alternatives 2a and 2b.

Build Alternatives 4a and 4b

Construction and Operation

Build Alternatives 4a and 4b would involve adding an HOT 3+ lane in each direction. Build Alternatives 4a and 4b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effect would be the same as effects on utilities and emergency services as described under Build Alternatives 2a and 2b.

Build Alternatives 5a and 5b

Construction and Operation

Build Alternatives 5a and 5b would involve adding an Express Lane in each direction. Build Alternatives 5a and 5b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effect would be the same as effects on utilities and emergency services as described under Build Alternatives 2a and 2b.

Build Alternatives 6a and 6b

Construction and Operation

Build Alternatives 6a and 6b would involve adding a transit-only lane in each direction. Build Alternatives 6a and 6b propose similar project components within the same project area as

Build Alternatives 2a and 2b, respectively. Therefore, the effect would be the same as effects on utilities and emergency services as described under Build Alternatives 2a and 2b.

Build Alternatives 7a and 7b

Construction and Operation

Utilities

Build Alternatives 7a and 7b would involve repurposing the current number 1 general purpose lane to HOV 2+. No new lanes would be constructed. The effect on utilities would be similar to effects described under Build Alternatives 2a and 2b, respectively.

Emergency Services

Temporary traffic delays and ramp closures on I-80/US-50 during construction of Build Alternatives 7a and 7b could result in temporary delays in emergency services. Because Build Alternatives 7a and 7b would not add new lanes, but would repurpose existing lanes as managed lanes, the Build Alternatives 7a and 7b construction period may have shorter duration and result in fewer delays than those under Build Alternatives 2a and 2b, respectively. As described in Build Alternatives 2a and 2b, to provide that emergency services are maintained during construction, Standard Measure TT-3, Traffic Management Plan, as described in the Traffic and Transportation/Pedestrian and Bicycle Facilities section, would be developed by Caltrans consistent with Caltrans' standard procedures to maintain access for emergency services throughout all phases of construction. The TMP would include elements such as traffic controls to minimize speeds/congestion and other measures to maintain access for police, fire, and medical services along I-80/US-50 in the project area during construction.

Build Alternatives 7a and 7b would ultimately improve circulation and reduce congestion along I-80/US-50 in the project corridor, which would result in improved emergency service access and response times. Therefore, Build Alternatives 7a and 7b would not result in an adverse effect on emergency services.

2.1.9.3 Avoidance, Minimization, and/or Mitigation Measures

No AMMs or MMs are required.

2.1.10 Traffic and Transportation/Pedestrian and Bicycle Facilities

2.1.10.1 Regulatory Setting

Caltrans, 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.

California Environmental Quality Act - Senate Bill 743 and Vehicle Miles Traveled

SB 743 requires the Governor's Office of Planning and Research (OPR) to identify new metrics for the identification of transportation related impacts within CEQA. On December 28, 2018, regulatory changes to the CEQA Guidelines that implement SB 743 were approved, establishing Vehicle Miles of Travel (VMT) as the new metric for transportation analysis. Thresholds for determining a project's significant transportation impact shall be pursuant to section 15064.3 of the State CEQA Guidelines. Within CEQA, a project's effect on vehicle delay shall not constitute a significant transportation impact (Section 15064.3(a)). OPR released a Technical Advisory that contains recommendations for assessing VMT, thresholds of significance, and mitigation measures. On July 1, 2020, statewide implementation occurred.

In response to the change, Caltrans has prepared guidance in the form of the Transportation Analysis Framework (TAF) and the Transportation Analysis under CEQA: Evaluating Transportation Impacts of State Highway System Projects (TAC), each published in September 2020.

2.1.10.2 Affected Environment

This section describes the existing and planned transportation system within the project area. A Transportation Analysis Report (TAR) (Caltrans 2023d) addresses the project area shown in Figure 2.1-5. Additional documents referenced in this section are listed below. The project study limits consist of I-80 at Pedrick Road in Solano County to the west and I-80 at Northgate Boulevard and US 50 at SR 51/SR 99 in Sacramento to the east.

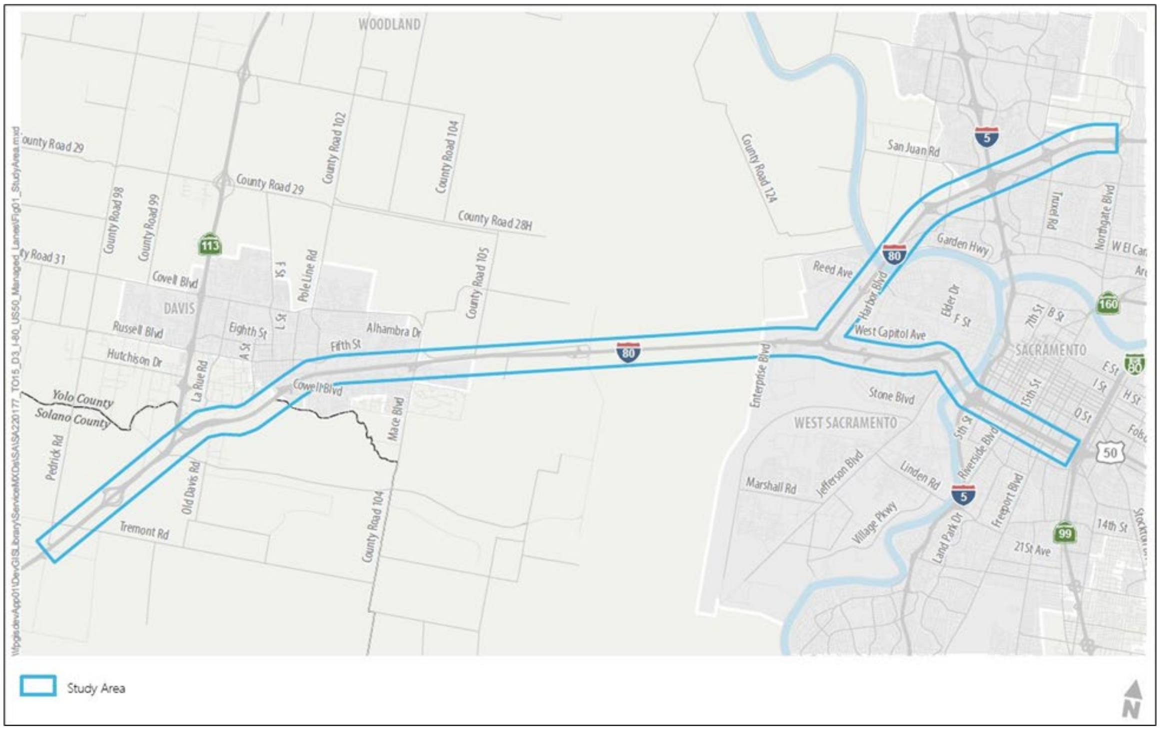


Figure 2.1-5. Transportation Analysis Report Study Area
Source: TAR (Caltrans 2023d)

Documents referenced for this analysis include the following:

- Interstate 80/US Highway 50 Managed Lanes Transportation Analysis Report (Caltrans 2023d)
- Interstate 80/US Highway 50 Managed Lanes Traffic Operations Report (Caltrans 2023e)
- Yolo 80 Managed Lanes Project, VMT Mitigation Plan (Caltrans 2023f)
- I-80/US 50 Managed Lanes Project, VMT Mitigation Estimates (Caltrans 2023g)
- I-80/US 50 Managed Lanes: Induced Travel & Truck VMT – Draft (Caltrans 2023h)
- Yolo 80 Corridor Improvements Project Draft Pedestrian and Bicyclist Travel Impact Assessment, (Caltrans 2023i)

2.1.10.3 Collision Data

Table 2.1-17 and Table 2.1-18 summarize the number of collisions and collision rates for the freeway segments of the project area on I-80 and US-50. The existing collisions and collision rates per million vehicle miles are presented for the most recent 5-year period from January 1, 2015, to December 31, 2019, from the Traffic Accident Surveillance and Analysis System (TASAS). The table provides a comparison of the actual collision rates to the average rates for similar facilities throughout California. Total collision rates include all reported fatal collisions, injury, and property damage collisions.

Analysis of the TASAS collision records shows that there was a total of 1,504 collisions (857 eastbound and 647 westbound) that includes 10 fatal collisions (4 eastbound and 6 westbound) for the I-80 segment from the Solano County line to US 50 during the 5-year period mentioned above. The total rate of fatal plus injury-related collisions is higher than the statewide average for the eastbound direction, but the fatal collision rate is lower than average. In the westbound direction, the actual collision rates for fatal, fatal plus injury, and total collisions are all lower than the statewide average.

Table 2.1-17. Freeway Segments— Traffic Accident Surveillance and Analysis System Collisions Summary (January 1, 2015, through December 31, 2019)

Segment		Total No. of Collisions*	Fatal Collisions	Fatal & Injury Collisions
I-80 from Solano Co. Line to US 50 (YOL 0.0 to R9.6)	EB	857	4	325
	WB	647	6	219
I-80 from US 50 to HOV Lane (YOL R9.6 to R11.7, SAC M0.0 to M1.4)	EB	137	1	47
	WB	402	2	138
US 50 from I-80 to I-5 (YOL 0.0 to 3.2, SAC L0.0 to L0.6)	EB	410	4	152
	WB	458	8	195

Source: Caltrans 2023d
Notes:
*Total reported collisions include Property Damage Only collisions
Key: EB = eastbound; WB = westbound

Table 2.1-18. Freeway Segments—Traffic Accident Surveillance and Analysis System Collision Rates (January 1, 2015, through December 31, 2019) per Million Vehicle Miles

Segment		Actual (per Million Vehicle Miles)			Average (per Million Vehicle Miles)		
		Fatal Collisions	Fatal + Injury Collisions	Total*	Fatal Collisions	Fatal + Injury Collisions	Total*
I-80 from Solano Co. Line to US 50 (YOL 0.0 to R9.6)	EB	0.003	**0.27****	**0.70****	0.006	0.22	0.67
	WB	0.005	0.18	0.53	0.006	0.22	0.67
I-80 from US 50 to HOV Lane (YOL R9.6 to R11.7, SAC M0.0 to M1.4)	EB	0.003	0.15	0.44	0.005	0.27	0.81
	WB	**0.006****	**0.44****	**1.29****	0.005	0.27	0.81
US 50 from I-80 to I-5 (YOL 0.0 to 3.2, SAC L0.0 to L0.6)	EB	**0.009****	**0.35****	**0.94****	0.003	0.27	0.84
	WB	**0.018****	**0.45****	**1.05****	0.003	0.27	0.84

Notes:
TASAS = Traffic Accident Surveillance and Analysis System; EB = eastbound; WB = westbound
*Total reported collisions includes Property Damage Only collisions
**(Bold) = actual collision rate greater than statewide average
Source: Caltrans 2023d

There was a total of 539 collisions (137 eastbound and 402 westbound) that included 3 fatal collisions (1 eastbound and 2 westbound) for the I-80 segment from US 50 to the start of the existing HOV lanes. The actual collision rate for all three categories is lower than the statewide average in the eastbound direction but higher for all three categories in the westbound direction.

There was a total of 868 collisions (410 eastbound and 458 westbound) that included 12 fatalities (4 eastbound and 8 westbound) for the segment of US 50 from I-80 to I-5. There was almost the same number of total collisions in each direction. The actual collision rate for all three categories is higher than the statewide average in both the eastbound direction and westbound direction.

Table 2.1-19 summarizes the number of collisions and collision rates at ramps where ramp meters would be installed under the build alternatives, as well as for the connector ramps at I-80/US-50 interchange.

As shown in Table 2.1-19, no collisions were recorded at four of the ramps during the 5-year period. The actual collision rates are higher than the statewide average at the remaining five ramp locations—SR 113 on-ramp to westbound I-80 had a higher than average fatal plus injury collision rate, SR 113 on-ramp to eastbound I-80 had a higher than average fatal collision rate, Richards Boulevard on-ramp to eastbound I-80 had a higher than average fatality plus injury collision rate, westbound I-80 to eastbound US 50 connector ramp had higher than average fatal plus injury collision rates as well as total collision rates, and the westbound US 50 to eastbound I-80 connector ramp has a higher than average total collision rate.

Table 2.1-19. Ramps—Traffic Accident Surveillance and Analysis System Collisions Summary (January 1, 2015 through December 31, 2019)

Ramp	Total No. of Collisions	Fatal Collisions	Fatal and Injury Collisions	Actual (per Million Vehicle Miles)			Average (per Million Vehicle Miles)		
				Fatal Collisions	Fatal + Injury Collisions	Total*	Fatal Collisions	Fatal + Injury Collisions	Total*
SR 113 On-ramp to WB I-80 (SR 113 PM SOL R21.9 to R22.0)	1	0	1	0.000	**0.22****	0.22	0.009	0.16	0.47
Old Davis Rd On-ramp to WB I-80 (PM SOL R43.2)	0	0	0	0.000	0.00	0.00	0.017	0.24	0.64
SR 113 On-ramp to EB I-80 (PM SOL R43.4)	4	1	1	**0.105****	0.11	0.42	0.020	0.24	0.53
Old Davis Rd On-ramp to EB I-80 (PM SOL R43.8)	0	0	0	0.000	0.00	0.00	0.017	0.24	0.64
Richards Blvd On-ramp to EB I-80 (PM YOL 0.5)	6	0	3	0.000	**0.28****	0.56	0.002	0.23	0.63
Mace Blvd On-ramp to WB I-80 (PM YOL 2.5)	2	0	2	0.000	0.19	0.19	0.002	0.23	0.63
County Rd 32A On-ramp to WB I-80 (PM YOL 2.5)	0	0	0	0.000	0.00	0.00	0.005	0.27	0.88
WB I-80 to EB US 50 Connector ramp (US 50 PM YOL 0.7)	7	0	5	0.000	**0.47****	**0.65****	0.005	0.15	0.48
WB US 50 to EB I-80 Connector ramp (US 50 PM YOL 0.6)	12	0	2	0.000	0.10	**0.57****	0.003	0.14	0.43

Source: Caltrans 2023d
Notes: *Total reported collisions includes Property Damage Only collisions
**Bold = actual collision rate greater than statewide average
Key: EB = eastbound; WB = westbound

2.1.10.4 Roadways

I-80 is a transcontinental highway that extends from San Francisco, CA to New York, NY. In the project area, I-80 serves commuter, freight, and recreational traffic between the San Francisco Bay Area and the Sacramento metropolitan area and provides one of two all-weather connections across the Yolo Bypass. I-80 is a six-lane freeway in most of the project area with an eight-lane portion from Kidwell Road to Old Davis Road in Solano County. System interchanges exist at SR 113, US 50, and I-5. Auxiliary lanes exist in both directions between Kidwell Road and SR 113, between Enterprise Boulevard/West Capitol Avenue and US 50, between West El Camino Avenue and I-5, between I-5 and Truxel Road, and between Truxel Road and Northgate Boulevard.

US-50 is a transcontinental highway that extends from I-80 in West Sacramento to Ocean City, MD. In the project area, US 50 serves commuter, freight, and recreational traffic between Yolo and Sacramento counties. US 50 is a six-lane to eight-lane freeway in the project area. Auxiliary lanes exist in both directions between I-80 and Harbor Boulevard, between Jefferson Boulevard and I-5, between I-5 and 15th Street/16th Street, and between 15th Street/16th Street and SR 51/SR 99. An eastbound auxiliary lane is provided from Harbor Boulevard to Jefferson Boulevard/Tower Bridge Gateway.

I-5 is a north-south freeway that extends from Mexico to Canada along the west coast of the United States. In the project area, I-5 serves regional traffic through the Central Valley and commuter traffic within the Sacramento metropolitan area. I-5 intersects both US 50 and I-80 in the project area. The I-5/US 50 interchange is near downtown Sacramento, and the freeway-to-freeway ramps also provide connections to P Street and Q Street. The I-5/I-80 interchange has a full cloverleaf configuration except that the westbound to southbound movement uses a direct connector ramp.

SR-113 is a north-south highway that runs from SR 12 west of Rio Vista to SR 99 south of Yuba City. In the project area, SR 113 is a four-lane freeway that connects I-80 to I-5 in Woodland. The system interchange ramps at I-80/SR 113 are braided with the adjacent I-80/Old Davis Road interchange.

SR-99 is a north-south highway that runs from I-5 south of Bakersfield to I-5 in Red Bluff. In the project area, SR 99 is an eight-lane freeway that connects US 50 at SR 51 with Elk Grove, Stockton, and the southern Central Valley. SR 99 serves commuters to and from downtown Sacramento.

SR 51 is a north-south eight-lane freeway that connects US 50 at SR 99 in downtown Sacramento to I-80 in northern Sacramento County. SR 51, which is signed as Business Loop 80, serves commuters in the Sacramento area.

Ramp meters operate on many of the ramp entrances to I-80 and US-50 during the morning and afternoon peak periods. Most metering locations operate with a variable metering rate based upon the freeway’s mainline flows and on-ramp queue lengths.

Existing condition freeway traffic volumes for the project area was provided in the TAR (Caltrans 2023d). The TAR summarizes data from the PeMS online database to obtain mainline and ramp volumes from October 2019, where available. For locations where PeMS data was not available, the TAR obtained traffic volumes from StreetLight Data. StreetLight Data uses location-based services data and GPS data (anonymized location records from smartphones and navigation devices). The PeMS and StreetLight Data were combined, and the resulting volumes were balanced along the corridor. The October 2019 balanced demand volumes for the morning and afternoon peak -hour within the project area range from approximately 10,000 vehicles per hour in both the EB and WB directions during the morning peak hour to approximately 8,000 and 9,000 vehicles per hour, respectively, in the EB and WB directions during the afternoon peak hour.

The numbers of HOVs, defined as vehicles with two or more occupants, currently using the corridor are summarized in Table 2.1-20 as a percentage of the total flow during the morning and afternoon peak periods for the eastbound and westbound directions. Since the counts were conducted during COVID-19 pandemic, when people were encouraged to work from home and schools were closed, the observed HOV percentages were compared with similar average percentages measured in 2019 on other Sacramento area freeways with HOV lanes (US 50, SR 99, and I-80 east of the project area) to confirm reasonableness for use in this analysis. The vehicle classification counts were collected on one day only.

Table 2.1-20. Average Percentage of HOVs by Time Period – Existing Conditions

Location	Morning Peak Period		Afternoon Peak Period	
	6-8 a.m.	8-10 a.m.	3-5 p.m.	5-7 p.m.
Eastbound	14%	14%	20%	22%
Westbound	20%	20%	20%	22%

Source: Caltrans 2023d
HOV = high-occupancy vehicle

Freeway speed and travel time data were obtained for both directions of travel along I-80 and US 50 within the project area from the INRIX Roadways web-based application for midweek days (Tuesday, Wednesday, and Thursday) in October 2019. Data was collected in 15-minute intervals. The average midweek peak period speeds were calculated to prepare a corridor speed contour plot. Individual day speed contour plots were reviewed to exclude days or areas where non-recurrent congestion occurred. The model speed contour plots for the freeway segments by direction and peak period are presented below in Figure 2.1-6 through Figure 2.1-9

Figure 2.1-6 shows the speed contour plots for the morning and afternoon peak periods for the eastbound corridor from I-80 at Pedrick Road to US 50 at SR 51/SR 99. During the morning peak period, two bottlenecks occur in the eastbound direction: one on I-80 at Mace Boulevard and the other on US 50 in downtown Sacramento. The congestion at Mace Boulevard lasts from about 7:30 to 8:00 a.m. and is limited to the interchange itself. The downtown bottleneck is in the weaving section between I-5 and 15th Street. Congested conditions last from approximately 7:30 to 9:00 a.m. and extend back through the Harbor Boulevard interchange.

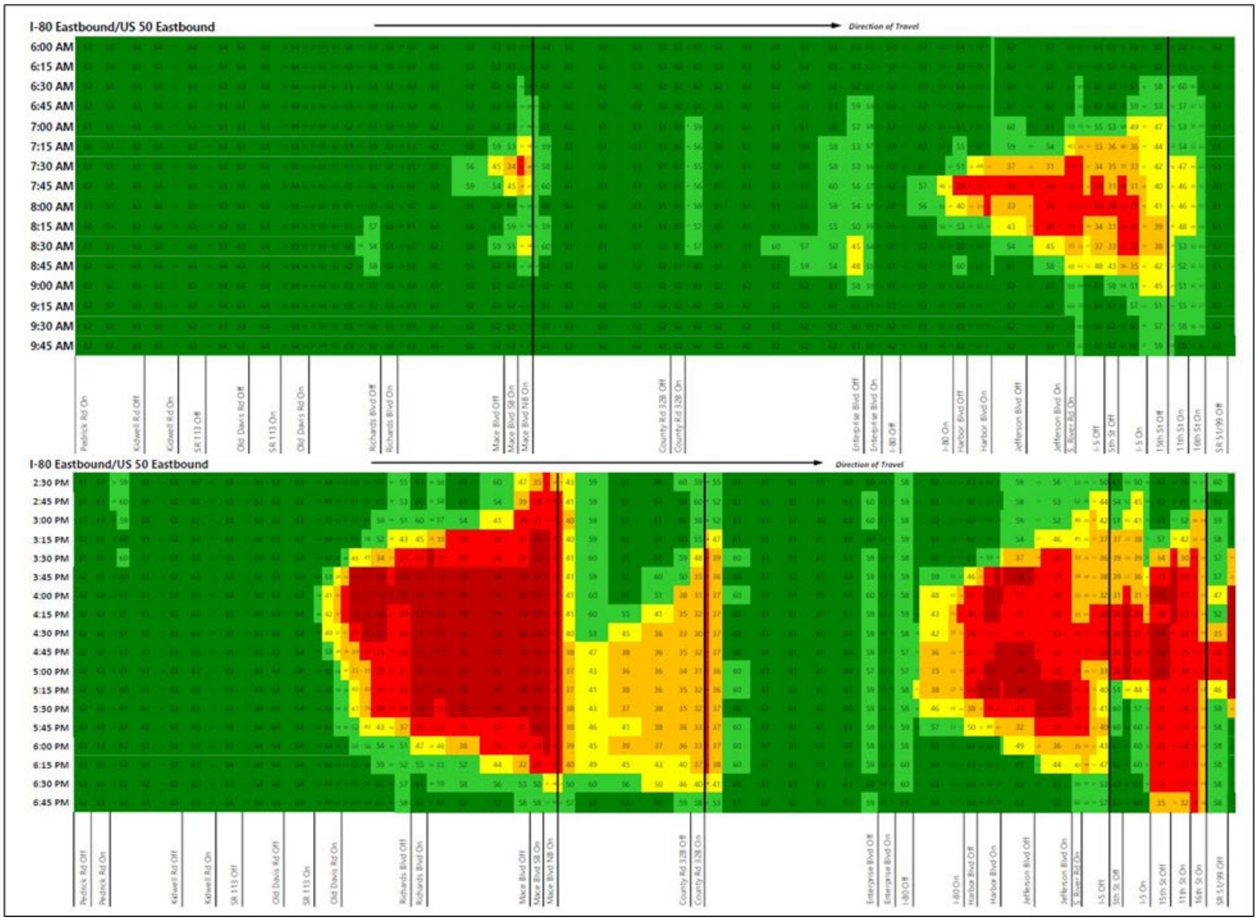


Figure 2.1-6. I-80 and US 50 Eastbound Average 2019 Weekday Speeds
Source: Caltrans 2023e

During the afternoon peak period, the eastbound I-80/US 50 corridor direction has several bottlenecks. The upstream bottleneck at Mace Boulevard lasts the entire peak period and results in congested speeds that extend back to Old Davis Road. The horizontal curve and the Mace Boulevard on-ramps traffic together create the bottleneck, which has a maximum throughput of about 4,800 vehicles per hour (vph) and lasts from approximately 2:30 to 6:30 p.m. Like Mace Boulevard, the secondary bottleneck at County Road 32B forms due to the on-ramp volume although a ramp meter on the on-ramp works to reduce this congestion. The bottleneck is also affected by the vertical curve at the beginning of the Yolo Causeway. The maximum throughput is about 5,320 vph, and congestion lasts from approximately 3:30 to 6:30 p.m. On US 50, the I-5 off-ramp and the weaving section between 16th Street and SR 51/SR 99 are bottlenecks. The first lasts from approximately 3:15 to 6:00 p.m. and the second from approximately 3:00 to 7:00 p.m. Both the SR 51 and SR 99 freeways also have downstream bottlenecks that can affect operations on US 50.

Figure 2.1-6 shows the speed contour plots for the morning and afternoon peak periods for eastbound I-80 from US 50 to Northgate Boulevard. During the morning peak period, eastbound I-80 from US 50 to Northgate Boulevard is not congested. However, two bottlenecks exist during the afternoon peak period. The Reed Avenue on-ramp serves as a bottleneck due to the on-ramp volume combined with the grade and reduced clear zone at the Bryte Bend bridge. Congested conditions last from approximately 4:15 to 6:15 p.m. and extend back to US 50. Freeway capacity downstream of the Reed Avenue on-ramp is about 5,100 vph. The I-5 to Truxel Road weaving section is also a bottleneck due to the heavy I-5 on-ramp volume entering the freeway. Congestion lasts from approximately 3:45 to 5:45 p.m.. Downstream of the project area, a bottleneck exists at the Steelhead Creek bridge just east of the Northgate Boulevard interchange that causes congestion to extend upstream of the Northgate Boulevard off-ramp.

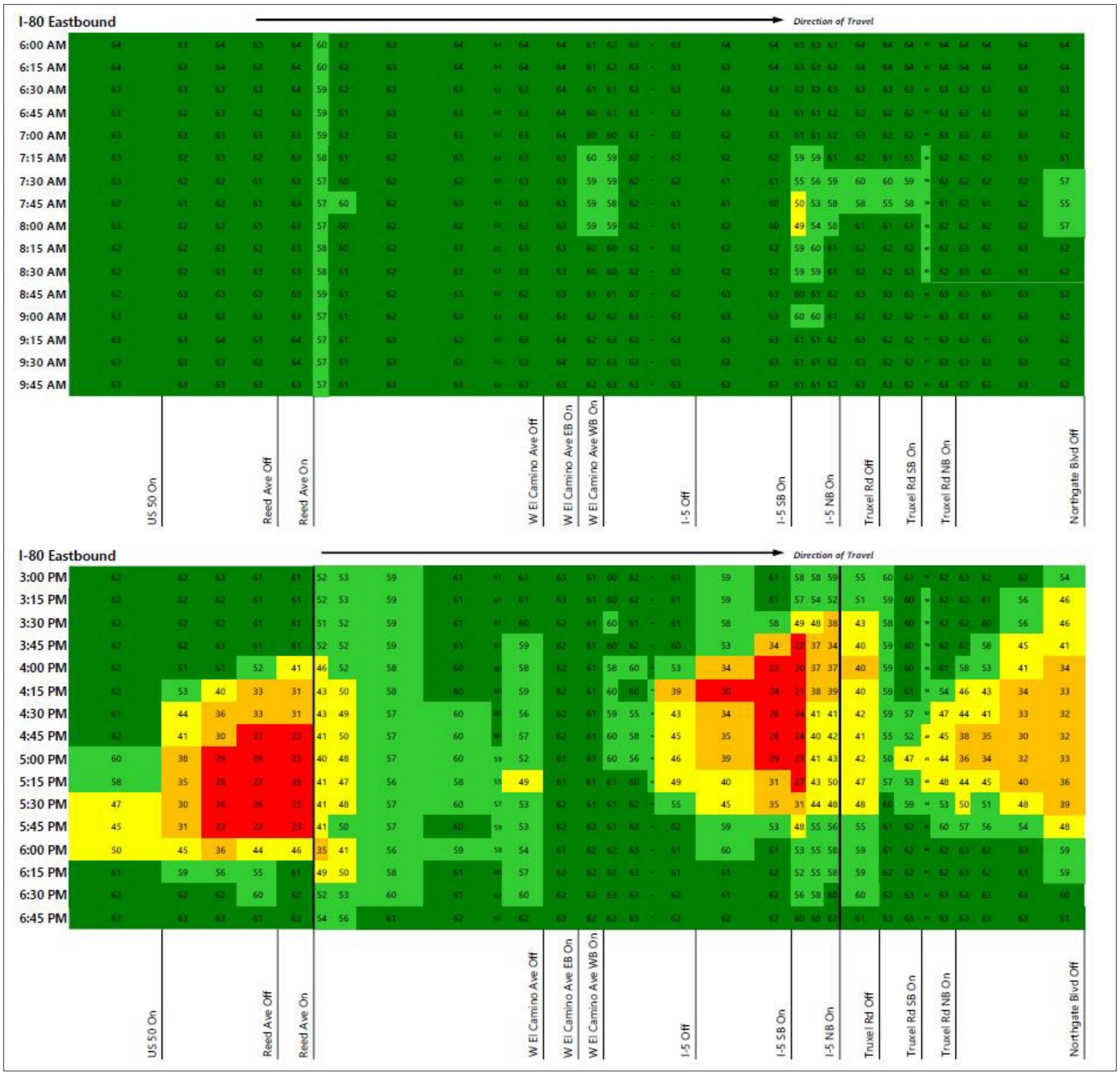


Figure 2.1-7. I-80 Eastbound Average 2019 Weekday Speeds

Source: Caltrans 2023e

Figure 2.1-7 shows the speed contour plots for the morning and afternoon peak periods for the westbound corridor from US 50 at SR 51/SR 99 to I-80 at Pedrick Road. During the morning peak period, the weaving section between the SR 51 on-ramp and the 16th Street off-ramp is a bottleneck from approximately 7:00 a.m. to after 9:00 a.m.. Congestion also occurs at the downstream weaving segment between 15th Street and I-5. At the downstream bottleneck at the Yolo Causeway, congestion begins at approximately 6:30 a.m. and lasts beyond the end of the analysis period at 10:00 a.m. Congestion extends from West Capitol Avenue upstream through the I-80 interchange. The maximum throughput on the Yolo Causeway is about 5,600 vph. During the afternoon peak period, the downtown section of US 50 has overlapping bottlenecks at SR 51 to 16th Street and the I-5 off-ramp. The downstream Jefferson Boulevard off-ramp is also a bottleneck, with a shorter duration of about an hour compared to the three hours of congestion downtown. The lane drop at Jefferson Boulevard requires the I-5 on-ramp traffic to merge over. Additionally, the off-ramp demand volume is greater than 1,500 vph, which suggests that two off-ramp lanes are needed. Like the morning peak period, the Yolo Causeway is also a bottleneck, but the congestion is less severe, only about two and a half hours in duration. The bottleneck throughput is about 4,700 vph.

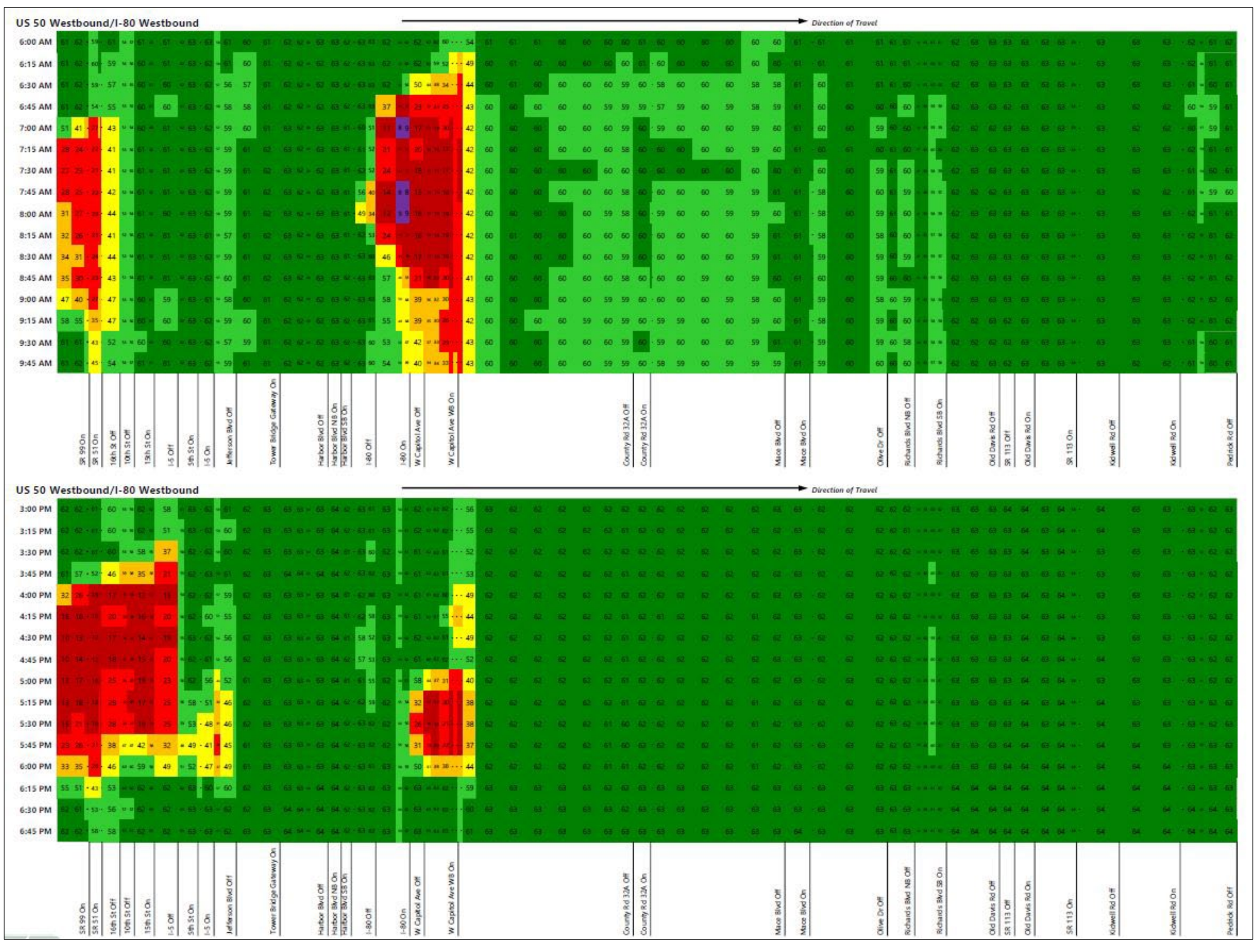


Figure 2.1-8. I-80 and US 50 Westbound Average 2019 Weekday Speeds

Source: Caltrans 2023e

Figure 2.1-8 shows the speed contour plots for the morning and afternoon peak periods for westbound I-80 from Northgate Boulevard to US 50. During the morning peak period, a bottleneck exists on southbound I-5 that extends onto the connector ramp from westbound I-80, which then causes congested conditions on westbound I-80 for about an hour. Congestion also extends from the Yolo Causeway bottleneck onto eastbound I-80 back to Reed Avenue. During the afternoon peak period, this freeway section is mostly uncongested. The only slow speeds occur near US 50 when congestion from the Yolo Causeway bottleneck extends back through this area.

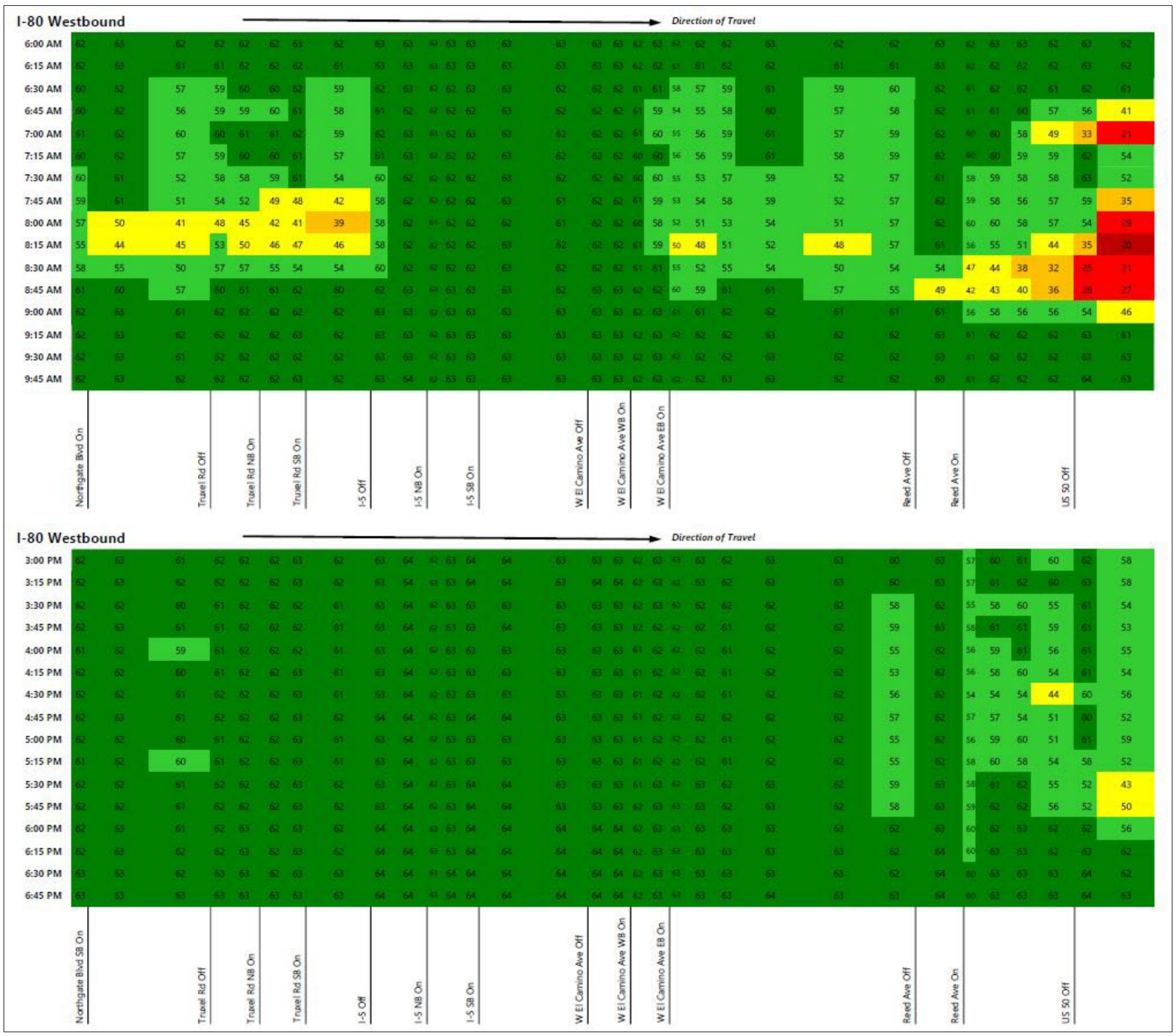


Figure 2.1-9. I-80 Westbound Average 2019 Weekday Speeds
Source: Caltrans 2023e

Peak hour travel times from the freeway traffic operations model is summarized in Table 2.1-21. For comparison purposes, the table also includes the free-flow travel time at the posted speed limit of 65 mph. During the morning peak hour, congested conditions affect eastbound travel times most prominently for eastbound US 50 from I-80 to SR 51/SR 99, which has an average travel time 46 percent greater, an additional 2.3 minutes (7.3 minutes vs. 5.0 minutes), than the uncongested travel time. For westbound travel times, US 50/I-80 from the I-80 eastbound off-ramp to Kidwell Road has an average travel time 39 percent greater, an additional 4.8 minutes (17.0 minutes vs. 12.2 minutes), than the uncongested travel time.

During the afternoon peak hour, average eastbound travel time is 88 percent greater than free-flow conditions for I-80 from Kidwell Road to US 50 and 142 percent greater than free-flow conditions for US 50 from I-80 to SR 51/SR 99. Westbound travel time experiences the most delay for US 50 from SR 51 to I-80 where the congested travel time is 85 percent greater than free-flow conditions, which equates to approximately 3.5 additional minutes (7.6 minutes vs. 4.1 minutes).

Table 2.1-21. Corridor Travel Times (Minutes) – Existing Conditions (2019)

Path	Free-Flow Conditions	Morning Peak Hour	Afternoon Peak Hour
I-80 Eastbound: Kidwell Rd Off-ramp to US 50 Off-ramp	12.2	13.1 (+7%)	22.9 (+88%)
US 50 Eastbound: I-80 to SR 51/SR 99 Off-ramp	5.0	7.3 (+46%)	12.1 (+142%)
I-80 Eastbound: US 50 Off-ramp to Truxel Rd Off-ramp	5.2	5.5 (+6%)	7.5 (+44%)
US 50/I-80 Westbound: I-80 EB Off-ramp to Kidwell Rd Off-ramp	12.2	17.0 (39%)	12.9 (+6%)
US 50 Westbound: SR 51 On-ramp to I-80 Off-ramp	4.1	4.5 (+10%)	7.6 (+85%)
I-80 Westbound: Truxel Rd SB On-ramp to US 50	5.3	5.8 (+9%)	5.3 (+0%)

Source: Caltrans 2023e
Notes: Travel time is reported in minutes. Free-flow is the travel time at the posted speed of 65 mph. The peak hours are 7:00 to 8:00 a.m. and 4:00 to 5:00 p.m.

Traffic LOS is a measure of traffic operating conditions that is designated A through F with LOS A representing free flow conditions and LOS F representing severe traffic congestion. Table 2.1-22 summarizes the LOS thresholds from HCM Seventh Edition for freeway sections.

Table 2.1-22. Freeway Level of Service Thresholds

LOS	Description	Density (vehicles/mile-lane)	
		Basic	Merge, Diverge and Weave
A	Free-flow speeds prevail. Vehicles are almost completely unimpeded in their ability to maneuver.	≤11	≤10
B	Free-flow speeds are maintained. The ability to maneuver with the traffic stream is only slightly restricted.	>11 to 18	>10 to 20
C	Flow with speeds at or near free-flow speeds. Freedom to maneuver within the traffic stream is noticeably restricted, and lane changes require more care and vigilance on the part of the driver.	>18 to 26	>20 to 28
D	Speeds decline slightly with increasing flows. Freedom to maneuver with the traffic stream is more noticeably limited, and the driver experiences reduced physical and psychological comfort.	>26 to 35	>28 to 35

LOS	Description	Density (vehicles/mile-lane)	
		Basic	Merge, Diverge and Weave
E	Operation at capacity. There are virtually no usable gaps within the traffic stream, leaving little room to maneuver. Any disruption can be expected to produce a breakdown with queuing.	>35 to 45	>35 to 43
F	Represents a breakdown in flow.	>45 or v/c > 1[1]	>43 or v/c > 1[1]

Source: *Highway Capacity Manual, 7th Edition* (Transportation Research Board, 2022)
Note: [1]Volume-to-capacity ratio (v/c) is greater than 1 (exceeds capacity)
Key: LOS = level of service; ≤ means less than or equal to, > means greater than.

Table 2.1-23 and Table 2.1-24 show the peak hour (7:00 to 8:00 a.m. and 4:00 to 5:00 p.m.) level of service (LOS) and average density at select ramp junctions and mainline sections under existing conditions for the eastbound and westbound directions, respectively.

Table 2.1-23. Select Eastbound Freeway Operational Summaries – Existing Conditions

Freeway Segment	Facility Type	LOS/Density[1]	
		Morning Peak Hour	Afternoon Peak Hour
I-80 EB: Old Davis Rd to Richards Blvd	Basic	C / 26	**F / 66***
I-80 EB: Richards Blvd to Mace Blvd	Basic	C / 26	**F / 66***
I-80 EB: Mace Blvd SB On-ramp	Merge	**F / 49***	**F / 73***
I-80 EB: Mace Blvd to County Rd 32B	Basic	D / 28	E / 40
I-80 EB: County Rd 32B On-ramp	Merge	D / 30	**F / 52***
I-80 EB: County Rd 32B to Enterprise Blvd	Basic	D / 31	D / 29
I-80 EB: Enterprise Blvd to US 50	Weave	B / 16	B / 17
US 50 EB: I-80 to Harbor Blvd	Weave	**F / 49***	**F / 66***
US 50 EB: Harbor Blvd to Jefferson Blvd	Weave	**F / 44***	**F / 58***
US 50 EB: Jefferson Blvd On-ramp	Basic	**F / 60***	**F / 51***
US 50 EB: I-5 to 15th St	Weave	E / 38	**F / 56***
I-80 EB: US 50 to Reed Ave	Basic	C / 18	**F / 62***
I-80 EB: W El Camino Ave to I-5	Basic	B / 16	D / 28
I-80 EB: I-5 SB On-ramp	Merge	D / 32	**F / 73***
I-80 EB: I-5 to Truxel Rd	Weave	D / 31	E / 41
I-80 EB: Truxel Rd to Northgate Blvd	Basic	D / 28	**F / 57***

Source: Caltrans 2023e
Notes: *(Bold face) indicates LOS F conditions. The peak hours are 7:00 to 8:00 a.m. and 4:00 to 5:00 p.m.
[1]Density is reported in vehicles per lane per mile.

For the eastbound direction, morning peak hour LOS F congested conditions occur on US 50 from the I-80 on-ramp in West Sacramento to the I-5 on-ramp in Sacramento. LOS F also occurs on I-80 at Mace Boulevard, but the segments on either side of the interchange operate at

LOS D or better. During the afternoon peak hour, LOS F conditions exist on I-80 from Old Davis Road to County Road 32B in Davis, on US 50 from Harbor Boulevard to the I-5 off-ramp, and on US 50 from the I-5 on-ramp past the SR 51/SR 99 off-ramp. LOS F also occurs on I-80 between US 50 and Reed Avenue, at I-5, and from Truxel Road to east of Northgate Boulevard.

For the westbound direction, morning peak hour LOS F congested conditions occur on from the I-80/US 50 interchange through the West Capitol Avenue interchange. During the afternoon peak hour, LOS F conditions exist on US 50 from east of SR 51/SR 99 to the 15th Street on-ramp. The Yolo Causeway bottleneck forms after the peak hour, so LOS F conditions occur after 5 p.m. at this location.

Table 2.1-24. Select Westbound Freeway Operational Summaries – Existing Conditions

Freeway Segment	Facility Type	LOS/Density[1]	
		Morning Peak Hour	Afternoon Peak Hour
US 50 WB: SR 51 to 16th St	Weave	E / 39	**F / 87***
US 50 WB: 15th St to I-5	Weave	B / 20	**F / 45***
US 50 WB: I-5 On-ramp	Merge	C / 24	C / 27
US 50 WB: Jefferson Blvd to Harbor Blvd	Basic	C / 20	B / 18
US 50 WB: I-80 Off-ramp	Diverge	C / 23	B / 15
I-80 WB: US 50 to W Capitol Ave	Weave	**F / 73***	B / 15
I-80 WB: W Capitol Ave WB On-ramp	Merge	**F / 51***	D / 33
I-80 WB: County Rd 32A to Mace Blvd	Basic	D / 31	C / 24
I-80 WB: Mace Blvd to Olive Dr	Basic	D / 29	C / 20
I-80 WB: Richards Blvd to Old Davis Rd	Basic	C / 21	B / 16
I-80 WB: Old Davis Rd On-ramp to SR 113 On-ramp	Basic	B / 18	B / 13
I-80 WB: Truxel Rd to I-5	Weave	D / 35	B / 20
I-80 WB: I-5 to W El Camino Ave	Weave	C / 21	B / 17
I-80 WB: W El Camino Ave to Reed Ave	Basic	E / 35	C / 25
I-80 WB: Reed Ave to US 50	Basic	C / 27	D / 28
US 50 WB: SR 51 to 16th St	Weave	E / 39	**F / 87***

Source: Caltrans 2023e
Notes: *(Bold face) indicates LOS F conditions. The peak hours are 7:00 to 8:00 a.m. and 4:00 to 5:00 p.m.
1Density is reported in vehicles per lane per mile.

2.1.10.5 Bicycle and Pedestrian Facilities

A comprehensive Pedestrian and Bicycle Travel Impact Assessment was completed by Caltrans in April 2023 (Caltrans 2023). The assessment evaluated the locations within and adjacent to the project area that consist of facilities and travel origins and destinations commonly used by pedestrians and bicyclists. Changes in traffic patterns resulting from the project that could affect pedestrians and bicyclists, changes to access and configuration of pedestrian and bicyclist facilities, and the effect of project construction on such facilities was addressed. The Highway Design Manual classifies Bikeway facilities as follows:

- Shared Roadways (No Bikeway Designation) are streets and highways without bikeway designations.
- Class I Bikeways (Bike Path) serve corridors not served by streets and highways. Class I facilities close gaps to bicycle travel caused by construction of freeways or because of the existence of natural barriers (rivers, mountains, etc.).
- Class II Bikeways (Bike Lane) are intended to delineate the right of way assigned to bicyclists and motorists and to provide for more predictable movements by each. To better accommodate bicyclists through corridors where insufficient room exists for side-by-side sharing of existing streets by motorists and bicyclists.
- Class III Bikeways (Bike Route) are shared facilities which serve either to provide continuity to other bicycle facilities (usually Class II bikeways); or designate preferred routes through high demand corridors.
- Class IV Bikeways (Separated Bikeways) is for the exclusive use of bicycles and includes a separation required between the separated bikeway and the through vehicular traffic.

The following describes the existing pedestrian and bicycle infrastructure within the project area.

Near the western limits of the project area, Old Davis Road is configured with Class II bike lanes that use green pavement markings at select locations. Parallel to Old Davis Road is a shared-use path that passes through the I-80 interchange with grade-separated crossings under the freeway ramps, allowing pedestrians and bicyclists to traverse through the interchange fully separated from vehicular traffic.

City of Davis roadways in the vicinity of the Richards Boulevard interchange include on- and off-street bicycle facilities and well-defined pedestrian infrastructure. Class II bike lanes are present on the Richards Boulevard overcrossing with a non-standard configuration in the westbound mixing zone where the path of travel for bicycles crosses the path of travel for vehicles approaching the westbound I-80 loop on-ramp. A sidewalk is present on the south side of the Richards Boulevard overcrossing only, and there are no marked crosswalks for pedestrians at the on- and off-ramps. The Yolo 80 Corridor Improvements Project Draft Pedestrian and Bicyclist Travel Impact Assessment (Caltrans 2023) notes how the Draft Downtown Davis Specific Plan identifies Richards Boulevard as part of its priority network for pedestrians, bicyclists, transit, and vehicular traffic. An off-street shared-use path is located approximately 1,200 feet southwest of the interchange, which allows pedestrians and bicyclists to cross under I-80, connecting the Davis Downtown area with residential areas on the opposite side of I-80.

The Dave Pelz Bike Overcrossing connects neighborhoods and employment centers in areas north and south of I-80. The overcrossing is part of the Davis Bike Loop, an approximately 12-mile-long bikeway used by bicyclists, walkers, and runners. The loop connects various portions of Davis and UC Davis and is primarily made up of shared-use paths with a few sections on residential streets. Roadways in the vicinity of each overcrossing consist of off-street shared-use paths, Class II bike lanes, and pedestrian facilities. A shared-use path runs along the west side of Pole Line Road connecting the Fifth Street shared-use path with residential areas south of I-80. Class II bike lanes are also present on Pole Line Road, Fifth Street east of Pole Line Road, Cowell Boulevard, and other roadways in the vicinity of Pole Line Road. Multiple shared-use paths are also present throughout the neighborhoods south of I-80, which provide a connection to the Pole Line Road shared-use path. A Class I bicycle path runs parallel to the north side of I-80 and begins at Olive Drive just west of the Pole Line Road overcrossing.

Roadways in the vicinity of the Mace Boulevard interchange include on- and off-street bicycle facilities and pedestrian infrastructure. Class II bike lanes are present on the Mace Boulevard overcrossing, and they connect to Class II bike lanes on Second Street just north of the interchange and to a shared-use path on the east side of Mace Boulevard at Second Street. A sidewalk is present on the east side of the Mace Boulevard overcrossing only. South of I-80, a Class IV cycle track is present on Mace Boulevard from Redbud Drive to Cowell Boulevard, which is configured as a protected intersection. A gap exists where no bike lanes are present on Mace Boulevard between Cowell Boulevard and the I-80 interchange. Connections from Mace Boulevard to the I-80 shared-use path are provided along the northerly edge of the westbound on- and off-ramps.

The roadways in the vicinity of the County Road 32 interchange include limited bicycle infrastructure and generally lack pedestrian infrastructure. A Class I bicycle trail is present along the north side of the Yolo Causeway. The Yolo Causeway Class I bicycle trail terminates at the west end of the causeway, and a connection to local roads is provided by a path between the causeway and CR-32A and CR-32B. CR-32A runs parallel to I-80 on the north side of the freeway and is configured with narrow paved shoulders that are used by bicyclists. No sidewalks are present in the vicinity of the interchange.

The Yolo Causeway bicycle path is located along the northerly edge of the I-80 Yolo Causeway. The west end of the causeway bicycle path connects with CR-32 east of Davis. The east end of the causeway bicycle path connects with West Capitol Avenue in West Sacramento. The Yolo Causeway bicycle path runs parallel to the westbound I-80 vehicle lanes and is separated from vehicular traffic by a concrete barrier with a chain link fence attached to the top of the barrier.

Sidewalks are located on the west side of Enterprise Boulevard and West Capitol Avenue through the I-80 interchange area. Roadways in the vicinity of the interchange include Class II bike lanes on West Capitol Avenue, which begin at the westbound I-80 ramp interchange. There are no marked bicycle facilities within the interchange area or south of the interchange on Enterprise Boulevard. Class II bike lanes are present on Industrial Boulevard south of the interchange. A Class I bicycle path begins on the west side of West Capitol Avenue and connects to the Yolo Causeway bicycle path. The bicycle path can be accessed approximately 350 feet east of the westbound I-80 off-ramp at a location that includes a marked crosswalk with overhead warning beacons. The bicycle path can also be accessed at a location immediately adjacent to the westbound I-80 on-ramp.

Sidewalks are provided on each side of the Harbor Boulevard overcrossing. Class II bike lanes are generally present on Harbor Boulevard through the interchange; however, gaps exist at some locations where bike lane striping is not provided. Marked crosswalks are provided at some locations but are missing at each of the free-flowing ramps. Bike lanes are not provided on Harbor Boulevard immediately north or south of the interchange area. Roadways in the vicinity of the interchange include Class II bike lanes on West Capitol Avenue and on Harbor Boulevard north of West Capitol Avenue. Class II bike lanes are present on Industrial Boulevard south of the interchange except for a gap between Harbor Boulevard and Terminal Street.

Sidewalks are provided on each side of the Jefferson Boulevard undercrossing. Immediately north of the interchange, a small gap in the sidewalk exists on the east side of Jefferson Boulevard. Crosswalks are not provided at the State Route 275 ramp intersections. No bike lanes are present on Jefferson Boulevard through the interchange. Class II bike lanes are provided on Jefferson Boulevard north of West Capitol Avenue and south of Webster Street. Class II bike lanes are also provided on Park Boulevard south of Webster Street and on West Capitol Avenue east of Jefferson Boulevard. Immediately west of Jefferson Boulevard, a Class III bike route is designated on West Capitol Avenue until Poplar Avenue where Class II bike lanes begin.

No sidewalks are provided on either side of South River Road in the area where the road passes underneath I-80. North of Tower Street, a sidewalk is provided on the east side of South River Road only. Class II bicycle lanes are provided on South River Road, north of Tower Street and south of the Caltrans maintenance yard driveway. A sidewalk is provided on the west side of South River Road south of the Caltrans maintenance yard driveway.

Sidewalks are provided on each side of the Reed Avenue undercrossing, and Class II bike lanes are provided through the interchange area and to the west. Class II bike lanes are also provided on Reed Avenue east of the interchange except for a gap between the eastbound ramps and Ikea Court/Riverpoint Drive.

A sidewalk is provided along the north side of West El Camino Avenue through the interchange; however, marked crosswalks are not provided at the ramps. Marked crosswalks are also not provided at the intersection of West El Camino Avenue and El Centro Road near the hotels and truck stop. Class II bike lanes are provided on West El Camino Avenue and on Orchard Lane.

2.1.10.6 Transit

Existing transit service on the corridor is provided by the Amtrak Capitol Corridor regional commuter rail, by Fairfield and Suisun Transit (FAST) express bus service, by Yolo County Transportation District’s Yolobus service, and by the Causeway Connection, which is operated by Yolobus and Sacramento Regional Transit. Except where noted, the service descriptions below reflect October 2019 conditions: that is, before service changes associated with the COVID-19 pandemic.

FAST operates the Blue Line express bus that provides weekday service between downtown Sacramento and Walnut Creek with a UC Davis stop in the project area. Effective August 2021, service is provided four times during each of the morning and afternoon peak periods.

The Capitol Corridor operates daily train service between San Jose and Auburn. On weekdays, 11 trains travel between Davis and Sacramento in each direction. Some of the trains terminate in Sacramento or Roseville rather than Auburn. Train service is approximately hourly during the morning and afternoon peak periods with longer headways during the middle of the day. The Sacramento and Davis stations are in the project area. The nearest station to the west is Fairfield-Vacaville and the nearest station to the east is Roseville.

Yolobus operates eight routes on I-80 in the project area. On weekdays, two routes provide intercity service throughout the day, and the other six are commuter routes between Davis and Sacramento. The intercity routes have stops adjacent to the park and ride lots at West Capitol Avenue and Mace Boulevard. The Yolobus routes are as follows:

- Routes 42A and 42B provide intercity service between Davis, Sacramento, and Woodland throughout the day. Route 42A travels in a clockwise direction and Route 42B travels in a counterclockwise direction. In the project area, Route 42A travels westbound along I-80 from West Capitol Avenue to Mace Boulevard and Route 42B travels eastbound from Mace Boulevard to Enterprise Boulevard. Service is provided hourly between 6:00 a.m. and 11:00 p.m.

- Route 43 provides commuter service between UC Davis and downtown Sacramento. Route 43 has five peak direction trips during each peak period (towards Sacramento in the morning and towards Davis in the afternoon). Route 43 travels between I-80 at Mace Boulevard and US 50 at Tower Bridge Gateway.

- Route 43R provides commuter service between UC Davis and downtown Sacramento. Route 43R has one off-peak direction trip during each peak period (towards Davis in the morning and towards Sacramento in the afternoon). Route 43R travels between I-80 at Richards Boulevard and US 50 at 5th Street in Sacramento.

- Route 44 provides commuter service between south Davis and downtown Sacramento. Route 44 has three peak direction trips during each peak period (towards Sacramento in the morning and towards Davis in the afternoon). Like Route 43, Route 44 travels between I-80 at Mace Boulevard and US 50 at Tower Bridge Gateway.

- Routes 230, 231, and 232 provide commuter service between Davis and downtown Sacramento similar to Route 43. Route 230 has three peak direction trips during each peak period (towards Sacramento in the morning and towards Davis in the afternoon) and travels between I-80 at SR 113 and US 50 at Tower Bridge Gateway. Route 232 has one peak direction trip during each peak period (towards Sacramento in the morning and towards Davis in the afternoon) and travels between I-80 at Mace Boulevard and US 50 at Tower Bridge Gateway. Route 231 is an additional route that is scheduled late in the afternoon peak period that picks up passengers that may have missed an earlier Route 230 or 232 bus.

The Causeway Connection (Route 138) provides daily service between UC Davis and the UC Davis Medical Center in Sacramento. On weekdays, 15 buses travel in each direction and hourly service is provided between 6:00 a.m. and 8:00 p.m. In the project area, the route travels between I-80 at Old Davis Road and US 50 at Stockton Boulevard, which is just east of the SR 51/SR 99 interchange.

In addition to these transit services, other organizations provide bus service along I-80. Commercial bus carriers include Greyhound, Megabus, and FlixBus. Recreational tour companies provide bus service to casinos and other recreational destinations in the Reno and Tahoe region.

2.1.10.7 Environmental Consequences

Caltrans has adopted guidelines in the form of the TAF and the TAC to guide the process of evaluating transportation impacts of State Highway System projects. Through the process of developing the TAF and TAC, Caltrans determined that induced travel demand, which is synonymous with induced VMT, represents the metric most appropriate for determining a transportation project's impact. Induced travel demand generally occurs when the cost for travel is lower after travel constraints, such as congestion, are reduced. In this context, cost can be in the form of travel time, actual financial cost (e.g., fuel and tolling), or a combination of both. Additional driving resulting from a capacity-enhancing highway project may occur due to factors such as a change in travel mode from transit to a single-occupant vehicle or choosing to make a trip that otherwise would not occur.

No-Build Alternative 1

Under the No-Build Alternative, managed lanes and transportation improvements would not be constructed or operated. As such, the No-Build Alternative would have no effect on current or future traffic or transportation conditions.

Build Alternatives 2a through 7b

Construction

Construction activities and ground-disturbing activities associated with the build alternatives would result in temporary traffic delays and ramp closures on I-80 and US 50 that could result in temporary effects on vehicular (including public transportation and emergency vehicles), bicycle, and/or pedestrian access in and near the project area. To maintain access through the project corridor, a transportation management plan (TMP) would be developed by Caltrans consistent with Caltrans standard procedures (Standard Measure TT-3 in Appendix E). The contractor would be required to schedule and conduct work to avoid unnecessary inconvenience to the public and to maintain access to community facilities, including bicycle and pedestrian facilities, within the work zone (Standard Measures TT-1 and TT-2). A TMP would plan construction in sections, with no more than one lane closed at a time and no successive ramp closures. The contractor would implement a planned public outreach program to keep area residents, businesses, community facilities, emergency service providers, and transit operators informed of the project construction schedule as part of the TMP. The TMP would include elements such as traffic controls to minimize speeds/congestion and other measures to maintain access during the construction period.

Operations

Vehicle volume forecasts were prepared for the project's opening year (2029) and a 20-year horizon (2049) for Alternatives 1, 2a, 3a, 4a, 5a, 6a, 7a, and 2b. Peak period conditions for Alternatives 2a and 2b, which are the HOV lane alternatives with and without the managed lane median ramps at the I-80/US 50 interchange, were modeled using a calibrated traffic simulation model. The changes in traffic conditions between these two alternatives are expected to apply and be similar to Alternatives 3a versus 3b, Alternatives 4a versus 4b, etc., as the only difference between these respective alternatives would be the addition of the managed lane median ramps. Therefore, operational analyses were not conducted for Alternatives 3b through 7b, but a qualitative discussion of the expected operations is provided in Section 8.1 of the TAR. Further detail from the travel demand modeling analysis is provided in the I-80/US 50 Travel Demand Modeling Report (Caltrans 2023h).

Traffic Forecasts

For Alternative 1 (No Build), afternoon peak hour demand volume is expected to increase by 22 percent at the Yolo Causeway by horizon year 2049. For alternatives with an added lane for HOVs and/or toll vehicles (Alternatives 2a through 5a, and 2b), the volume growth from existing conditions would range from 27 to 37 percent. At the Sacramento River bridges on I-80 and US 50, the growth rates would be higher for Alternative 1 (35 and 29 percent), but the added lane alternatives would have similar or higher growth rates.

In addition to preparing traffic volume forecasts, the travel demand model was used to estimate regional and corridor performance measures including VMT, personal miles traveled (PMT), peak hour travel times, vehicle hours of delay, average speeds, and network volumes served. For opening year 2029, the model predicted higher VMT with each of the build alternatives compared to Alternative 1 (No Build), as expected.

By horizon year 2049, I-80 and US 50 in the project area would become so congested that travelers would seek longer paths to have a lower travel time. I-5 between Woodland and Sacramento County would have a higher demand volume under Alternative 1. With the additional capacity provided under the other alternatives, travelers would shift back to I-80.

Since the SACSIM travel demand model does not pass the TAF (Caltrans 2020b) checklist for travel demand models to adequately estimate induced demand, the National Center for Sustainable Transportation (NCST) Induced Travel Calculator was applied as outlined by the TAF procedures. Alternatives 2a through 7b would include some additional capacity and all would increase VMT. VMT cannot be estimated for Alternatives 6a and 6b using the NCST Induced Travel Calculator since Alternatives 6a and 6b restrict the new lane to buses only, which is not a configuration addressed by the methodology. Alternative 7a (Convert HOV) would have the lowest increase in VMT over Alternative 1 (No Build). The increase in VMT under Alternatives 2a through 5a would be the same and would be more than 40 times the VMT increase for Alternative 7a. Alternative 2b would have a slightly higher VMT increase in comparison to Alternative 2a since it would add more lane-miles.

Opening Year 2029 Conditions

For the morning peak period, eastbound I-80 and US 50 would have the same bottleneck locations as existing conditions, and congestion in the project area under Alternative 1 (No Build) would be about the same. Alternatives 2a through 6a, and 2b would eliminate the 45 minutes of congestion otherwise occurring at Mace Boulevard under Alternative 1. Alternative 7a (Convert HOV) would have about two-and-a-half hours of congestion in the general-purpose lanes at Mace Boulevard. Westbound I-80 congestion at the Yolo Causeway would grow under Alternative 1 to extend outside the morning peak period and extend upstream to I-5 on both US 50 and I-80. Alternative 6a (Add Transit) would have conditions similar to Alternative 1, and Alternative 7a would have worse congestion extending into downtown Sacramento on US 50. Congestion under Alternatives 2a through 5a, and 2b would also extend outside the peak period, but the queue would extend upstream only to Harbor Boulevard on US 50. Alternative 2b (Add HOV with Median Ramps) would have less upstream congestion on I-80 in comparison to Alternative 2a.

For the afternoon peak period, congestion at the eastbound I-80 bottlenecks at Mace Boulevard and County Road 32B would expand to outside the afternoon peak period under Alternatives 1 and 6a. Alternatives 2a through 5a, and 2b would have increased throughput at Mace Boulevard and would eliminate the County Road 32B bottleneck. However, the increased throughput would increase downstream congestion on US 50 and I-80 at I-5. Under these alternatives, the congestion at the I-5/I-80 interchange would extend back to Mace Boulevard. Alternative 7a would be congested for the entire peak period due to major bottlenecks at Mace Boulevard, Harbor Boulevard, and I-5. In the westbound direction, additional congestion upstream on US 50 in downtown Sacramento would result in less congestion at the Yolo Causeway under Alternative 1. Except for Alternative 7a, the other alternatives would have similar congestion for an hour or less at the West Capitol Avenue interchange. Alternative 7a would have about two-and-a-half hours of congestion at the Yolo Causeway that would extend back into the I-80/US 50 interchange.

Horizon Year 2049 Conditions

For the morning peak period, eastbound I-80 congestion under Alternative 1 (No Build) at Mace Boulevard would grow to two-and-one-half hours and congestion at the County Road 32B bottleneck would be about one hour. On eastbound US 50, congestion from the I-5 bottleneck would extend back to I-80. Alternative 6a (Add Transit) would have less congestion at Mace Boulevard and County Road 32B (less than an hour at each). Alternatives 2a through 5a, and 2b would have no congestion at Mace Boulevard and County Road 32B, and I-5 congestion would only extend to about Jefferson Boulevard. Alternative 7a would have bottlenecks at Mace Boulevard, County Road 32B, and South River Road that would start around 7:00 a.m. and extend beyond 10:00 a.m.

Westbound I-80 morning peak period congestion at the Yolo Causeway would grow under Alternatives 1 and 6a to extend outside the morning peak period and extend upstream to SR 51/SR 99 on US 50 and merge with a bottleneck at West El Camino Avenue on I-80 to extend upstream beyond Northgate Boulevard. Alternative 7a would have worse congestion upstream on both US 50 and I-80 with speeds lower than 20 mph for most of the morning peak period.

Under alternatives 2a through 5a, and 2b, congestion at the Yolo Causeway bottleneck would be lower, but a new bottleneck would form at the lane drop after the US 50 off-ramp. The combined congested area would extend outside the peak period and extend upstream to Harbor Boulevard on US 50. Alternative 2b (Add HOV with Median Ramps) would have the least upstream congestion on both US 50 and I-80 with the additional capacity provided by the median ramp from I-80 and the reduced volume in the weaving section on I-80 between US 50 and West Capitol Avenue.

For the afternoon peak period, congestion at the eastbound I-80 bottlenecks at Mace Boulevard, County Road 32B, and South River Road would expand to outside the afternoon peak period under Alternatives 1 and 6a. Congestion at Mace Boulevard would extend upstream of Pedrick Road in Solano County by 4:00 p.m. Alternatives 2a through 5a, and 2b would have increased throughput at Mace Boulevard and would delay the congestion at Pedrick Road until 5:00 p.m. Congestion at the County Road 32B and South River Road bottlenecks would be reduced, but the congestion at the I-80/US 50 interchange due to queuing from the I-5/I-80 and/or I-80/Reed Avenue interchanges would be similar to Alternative 1. Alternative 7a would be congested for the entire peak period due to major bottlenecks at Mace Boulevard, Harbor Boulevard, and I-5.

In the westbound direction during the afternoon peak period, a new bottleneck at the Jefferson Boulevard and I-80 off-ramps on US 50 would have one-and-a-half hours of congestion under Alternative 1. Congestion on I-80 at the Yolo Causeway would last more than three hours and extend upstream to US 50. Alternatives 2a, 3a, 6a, 7a, and 2b would also have a bottleneck at the Jefferson Boulevard off-ramp. Alternatives 2a through 4a and 6a, 7a and 2b would also have a bottleneck at the I-80 off-ramp. The Reed Avenue off-ramp would also have high demand volumes leading to congested conditions for the ramp diverge under all project alternatives.

Safety Impacts

Under Alternative 1 (No Build), collision rates would be the same as existing conditions. With the forecasted increase in traffic volumes, congestion and congestion-related collisions would increase. The freeway segments with higher-than-average collision rates would continue to experience the same collision rates. Alternatives 2a through 5a, and 2b would reduce congestion compared to Alternative 1. Alternatives 2a through 6a, and 2b would be expected to lower the collision rate since these alternatives add a lane in most of the project area.

Transit Impacts

Although transit service was not assumed to change among the analysis years, transit ridership will differ based on the travel time performance under the project alternatives. Alternative 6a (Add Transit) would have the highest ridership since only buses would have the travel time savings provided by the managed lanes. Alternatives 2a through 5a, and 2b would have similar transit ridership and an increase over Alternative 1 (No Build). Alternative 7a would have the lowest ridership and a decrease compared to Alternative 1 due to network congestion.

Bicycle and Pedestrian Impacts

Each of the build alternatives would replace the existing bicycle pathway pavement behind the gas station located north of West Capitol Avenue from PM 9.15 to PM 9.35. The existing bicycle pathway would be rerouted during repaving activities for up to two months, but repaving activities may occur at nighttime to minimize access disruption. To maintain access, bicycles traveling westbound would be redirected along West Capitol Avenue. Bicycles traveling eastbound would be redirected along a short segment of sidewalk on West Capitol Avenue and use the crosswalk at the West Capitol Avenue/westbound I-80 off-ramp intersection[1]. Bicyclists would then continue eastbound along West Capitol Avenue using the existing bicycle lane. Caltrans would add crosswalk pavement marking across the westbound I-80 off-ramp to West Capitol Avenue and near the existing West Capitol Avenue crosswalk. In addition, Caltrans would add advanced warning signs to alert the motorists traveling on the westbound I-80 off-ramp to West Capitol Avenue before reaching the proposed crosswalk. Caltrans would place signage as part of the traffic management plan to note the access updates and identify the bicycle/pedestrian detours.

The build alternatives would also replace the existing bicycle pathway pavement from PM 9.1 to the Yolo Causeway bridge deck approach at approximately PM 8.9. While the existing Class I bicycle pathway is closed, a temporary bicycle pathway with K-rail barrier would be placed along the I-80 westbound on-ramp from West Capitol Avenue. Up to 100 linear feet of existing barrier near PM 8.9 would be removed and realigned to allow bicycles to rejoin the existing Class I Bicycle Pathway along Yolo Causeway. The existing Class I bicycle pathway along the Yolo Causeway would not require closure during construction activities.

Each of the build alternatives would extend the westernmost limit of the existing Class I bicycle pathway from I-80 along Yolo Causeway to connect to County Road (CR) 32A. The pathway extension would be located adjacent to the westbound I-80 off-ramp to CR-32A and would be approximately 12-feet wide. The area surrounding the pathway extension would be graded to comply with the Americans with Disabilities Act of 1990 (ADA) regulations. A concrete barrier would separate the pathway extension from westbound off-ramp vehicular traffic. Once construction of the pathway extension along westbound I-80 off-ramp is complete, the build alternatives would conduct pavement rehabilitation from CR-32A to Levee Road. During pavement rehabilitation activities, Levee Road would be closed. Bicycles would be redirected along the newly constructed pathway extension on westbound I-80 off-ramp to access the existing Class I bicycle pathway along Yolo Causeway, which would be built prior to rehabilitation activities on Levee Road.

The Build alternatives would also include widening the shoulders of CR-32A from the existing Levee Road path to just east of CR-105 to accommodate a standard Class I bicycle path. In addition, the build alternatives would include widening the shoulders of CR-32A from CR-105 to the proposed Class I bicycle path along CR-32A to accommodate a standard Class II bicycle lane. Construction of the Class II bicycle lane would involve widening the shoulders by 4 feet for

[1] City of West Sacramento Municipal Code 10.32.020 states that bicycles are permitted on the public sidewalk but shall yield to any pedestrian.

the Class II 6-foot lane on both sides with standard edge line striping. No barriers would be constructed. Caltrans would coordinate with Yolo County Public Works Department to complete this bicycle pathway design along CR32A.

Alternatives Comparison

Table 2.1-25 provides a qualitative assessment of selected performance measures for the horizon year 2049. The alternatives are scored from 1 to 5, with 1 being very good performance and 5 being very poor performance. Peak period conditions for Alternatives 2a and 2b, which are the HOV lane alternatives with and without the managed lane median ramps at the I-80/US 50 interchange, were modeled using a calibrated traffic simulation model. The changes in traffic conditions between these two alternatives are expected to apply and be similar to Alternatives 3a versus 3b, Alternatives 4a versus 4b, etc., as the only difference between these respective alternatives would be the addition of the managed lane median ramps. Therefore, operational analyses were not conducted for Alternatives 3b through 7b, but a qualitative discussion of the expected operations is provided in Section 8.1 of the TAR.

Table 2.1-25. Alternatives Comparison – Horizon Year 2049

Performance Measure	Alt 1	Alt 2a	Alt 3a	Alt 4a	Alt 5a	Alt 6a	Alt 7a	Alt 2b
Regional VMT	5	2	3	2	1	4	2	3
Corridor PMT	5	2	1	3	4	5	5	2
Persons served at bottlenecks	3.5	1	2	2.5	2.5	3.5	5	1
General purpose lane peak hour travel time	3.5	1.5	1.5	2	2	3	5	2
General purpose lane peak hour planning time index	4	2	2	2.5	1.5	3	5	2.5
Managed lane peak hour travel time	4.5	2	1.5	1.5	1.5	3	5	1.5
Vehicle hours of delay	4	2	2.5	2	1.5	2.5	5	1.5
Average speed	4	1.5	2.5	2	2	2.5	5	1
Total vehicles served	3.5	1.5	2	3	3	3	5	1
Total persons served	3	1	2	4	3	2.5	5	1
Deficient segments	5	2.5	2.5	2	1.5	3	4	1.5
Average score	4.1	1.7	2.0	2.4	2.1	3.2	4.6	1.6

Source: Caltrans 2023d
Notes: Comparison is based on a scale of 1 to 5, where 1 represents very good performance and 5 represents very poor performance.
Key: VMT = Vehicle miles traveled; PMT = Personal miles traveled

Alternatives 2a and 2b have the best overall performance, including very good performance in two categories for Alternative 2a and four categories for Alternative 2b. Alternative 2a would have at least good performance for all categories, and Alternative 2b would have neutral performance for only regional VMT. These alternatives would increase freeway capacity in the form of a HOV lane so that faster travel time would be available to vehicles eligible for the HOV lane. These alternatives would increase both vehicle and person throughput at the key bottlenecks: eastbound I-80 at Mace Boulevard and westbound

I-80 at the Yolo Bypass. Alternative 2b would perform better than all other alternatives during the morning peak period since the median ramps at I-80/US 50 would provide a travel time advantage to HOVs, but afternoon peak hour travel time would be worse since fewer general purpose lanes would be provided on eastbound I-80 between Enterprise Boulevard and US 50. The morning peak period performance leads Alternative 2b to have the best overall average score.

Alternatives 3a, 4a, and 5a would perform well, although not as high as Alternatives 2a and 2b. For Alternative 3a, performance would be worse because more vehicles would be eligible for the managed lane than in the other alternatives, so congestion would be higher where vehicles are entering and leaving the managed lane. In particular, the transition section from the HOT lane to the existing HOV lane on eastbound I-80 near West El Camino Avenue would have more turbulence than the other alternatives in a location where the general purpose lanes are congested from a downstream bottleneck at I-5. The additional turbulence would result in longer travel times and lower network average speed. Alternative 4a would also have turbulence at the transition sections. Additionally, Alternative 4a would serve fewer people overall since HOV2s would have to pay to use the managed lane. For Alternative 5a, restricting the managed lane to tolled vehicles would restrict vehicles served and persons served since ridesharing would not provide a travel time savings. However, these alternatives perform better than Alternatives 1 and 7a and offer better travel time reliability in the managed lane than the HOV lane alternatives.

Alternative 6a would not perform well compared to the other alternatives. While person throughput could be improved if additional bus service were provided, the forecasted passenger vehicle volume would be constrained by the network capacity resulting in performance like Alternative 1 for many performance measures. Alternative 7a would also perform poorly. While the HOV lane would provide lower travel time than in the general purpose lanes, congestion in the general purpose lanes would be such that HOVs would be severely delayed entering and exiting the HOV lane.

The TAF provides two approaches to assess the induced VMT attributable to the project; the first being an empirical approach using the NCST Induced Travel Calculator and the second by applying a regional or local area travel demand model. Both the calculator and the travel demand models have strengths and limitations when estimating induced VMT depending on the specific corridor under analysis. Therefore, both the corridor context and analysis limitations are considered when using VMT forecasts from either method. The advantages and disadvantages of these methods are described in the TAR (Caltrans 2023d).

Table 2.1-26 presents the estimated long-term induced travel based on the NCST calculator. The calculator does not estimate the induced VMT for transit-only lane alternatives (Alternatives 6a and 6b). Caltrans has determined that the NCST calculator be used to report VMT for the project alternatives, since the travel demand model does not satisfy all five checks of the TAF's checklist for evaluating adequacy of the travel demand model. These alternatives have the potential to induce VMT, which may constitute a potentially significant impact under the California Environmental Quality Act (CEQA). The induced VMT for Alternatives 6a and 6b, the transit lane alternatives, cannot be calculated by the NCST calculator; however, added transit service generally does not induce auto VMT.

As shown in Table 2.1-26, the NCST calculators induced daily and annual VMT estimates indicate that all the project alternatives would result in substantial increases in VMT, which would represent an adverse effect with respect to induced travel except for No Build Alternative 1 and the transit-only lane Alternatives 6a and 6b. The NCST calculator cannot calculate induced VMT for transit-only lane alternatives (Alternatives 6a and 6b); however, added transit service generally does not induce auto VMT.

Table 2.1-26. Daily and Annual Induced VMT

Project Alternatives	Induced Total Daily VMT	Induced Truck Daily VMT	Induced Total Annual VMT	Induced Auto Annual VMT
Alternative 1 (No Build)	—	—	—	—
Alternative 2a (Add HOV)	+495,300	143,600	180,784,500	128,370,500
Alternative 3a (Add HOT2+)[1]	+495,300	143,600	180,784,500	128,370,500
Alternative 4a (Add HOT3+)[1]	+495,300	143,600	180,784,500	128,370,500
Alternative 5a (Add Toll)[1]	+495,300	143,600	180,784,500	128,370,500
Alternative 6a (Add Transit)	—	—	—	—
Alternative 7a (Convert HOV)	+12,300	3,600	4,489,500	3,175,500
Alternative 2b (Add HOV with Median Ramps)	+516,000	149,600	188,340,000	133,736,000
Alternative 3b (Add HOT2+ with Median Ramps)	n/a	n/a	188,340,000	133,736,000
Alternative 4b (Add HOT3+ with Median Ramps)	n/a	n/a	188,340,000	133,736,000
Alternative 5b (Add Toll with Median Ramps)	n/a	n/a	188,340,000	133,736,000
Alternative 6b (Add Transit with Median Ramps)	—	—	—	—
Alternative 7b (Convert HOV with Median Ramps)	n/a	n/a	12,045,000	8,541,000

Source: Caltrans 2023d, Caltrans 2023g
Key: n/a = daily induced VMT was not calculated for all alternatives, VMT = vehicle miles traveled

2.1.10.8 Avoidance, Minimization, and/or Mitigation Measures

As mentioned in Section 2.2.1.7, Alternative 1 is the no-build Alternative and would not have a negative impact on transportation since it would not induce additional vehicular travel. Similarly, Alternatives 6a and 6b, which add transit-only lanes, are not expected to induce additional automobile VMT.

AMMs have been specified to reduce, avoid, and offset VMT impacts from the project build Alternatives 2a/b through 5a/b, and 7a/b. The following measures to avoid or minimize VMT impacts would be implemented by the project:

- AMM TRANS-1: Reduce the induced VMT effects of the project Alternatives 2a/b through 5a/b, and 7a/b by contributing funding to regional VMT reducing measures. Caltrans will contribute $55 million, roughly 15 percent of the total capital construction cost, to the following eight measures: 1) Voluntary trip reduction program in Yolo County ($10 million); 2) Expand Capitol Corridor Frequency between Oakland and Sacramento ($15 million) ; 3) Microtransit in Yolo County ($7.5 million); 4) Subsidize monthly transit passes in Yolo County ($5 million); 5) Reduce transit fares ($5 million); 6) Expand causeway connection Route 138 ($4 million); 7) Expand Unitrans ($3.5 million); 8) Build overcrossing at future Nishi Student Housing Development site.

The annual induced auto VMT from the build alternatives (roughly 128-133 million annual auto VMT for the added-lane alternatives and roughly 3-9 million annual auto VMT for the general-purpose lane conversions to HOV) would need to be reduced through the action of VMT reducing measures. Table 2.1-27 summarizes potential measures and the associated VMT reduction to be expected by implementation of the measure as described in the Yolo 80 Managed Lanes Project VMT Mitigation Plan (Caltrans 2023f). However, as shown the potential total VMT reduction from these measures (approximately 57.1 million annual auto VMT) is not sufficient to offset the induced VMT forecasts of approximately 128-133 million annual VMT for most of the project alternatives. It would be sufficient to fully offset only the alternatives that would convert an existing lane to an HOV-only lane (Alternatives 7a and 7b).

However, full implementation of these VMT-reducing measures is outside the regulatory authority of Caltrans and are not sufficient to fully offset the induced VMT impact of Alternatives 2a/b through 5a/b.

The non-housing mitigation measures are based on 2040 conditions according to the SACSIM model. Some portion of the VMT reduction may not apply if the monthly transit pass subsidies and reduced transit fares are offered. The strategies offer different methods for reducing transit costs but may end up targeting similar people that could dampen the reported effectiveness.

Table 2.1-27. Vehicle Miles Traveled Reducing Measures

Mitigation Measure	Description	Annual VMT Reduced	Cost to Construct or Implement	Yolo 80 Managed Lane Contribution	$/VMT
Voluntary Trip Reduction Program in Yolo County	Part of an approved program provided by Yolo Commute, that include features such as community-based travel planning, ridesharing, transit pass subsidies, and pay-per-mile auto insurance; no physical improvements; payments directly to Yolo Commute.	24.7 million	$4 million (annual cost to implement program)	$10 million over 20 years (to be supplemented with future toll revenue)	$0.40
Expand Capitol Corridor Frequency between Oakland and Sacramento	Increase Capitol Corridor rail service by three round trip trains between Oakland and Sacramento, on an annual basis. Buying three new trains; no physical improvements – not in an approved MTP – proposed concept	12.6 million	$5 million (annual cost to operate three (3) additional roundtrip train services. Currently running 12 roundtrip trains, this measure would allow for a total of 15 roundtrip trains)	$15 million over 3 years (to be supplemented with future toll revenue)	$1.20

Mitigation Measure	Description	Annual VMT Reduced	Cost to Construct or Implement	Yolo 80 Managed Lane Contribution	$/VMT
Micro transit in Yolo County	Expand transit service by 25% to add flexible route buses with more frequent service and/or longer service hours, add more buses to an existing route; no physical improvements; payment to Yolo County.	6.2 million	$1.5 million (annual cost to expand service)	$7.5 million over 5 years (to be supplemented with future toll revenue)	$1.20
Subsidize Monthly Transit Passes in Yolo County	Incentivize transit ridership through subsidizing monthly transit passes and frequent users of Yolobus and Capitol Corridor. This measure utilizes a different strategy for reducing transit costs than the Reduce transit Fares below, payment into an existing program; no physical improvements.	5.6 million	$225k (annual cost to subsidize)	$5 million over 20 years (to be supplemented with future toll revenue)	$0.89
Reduce Transit Fares	Reduce the monthly bus fare for Yolobus and Capitol Corridor by 50%. This measure utilizes a different strategy for reducing transit costs than the Subsidize Monthly Transit Passes above, payment into an existing program; no physical improvements.	3.7 million	$225k (annual cost to reduce fares)	$5 million over 20 years (to be supplemented with future toll revenue)	$1.34
Expand Causeway Connection Route 138	Reduce service headways from 60 minutes all day to 15 minutes for morning and afternoon peak periods and 30 minutes for midday/off-peak periods for Route 138, payment directly to an agency (Sac RT and YoloTD) for adding new buses; no physical improvements.	3.1 million	$800k (annual cost to expand service)	$4 million over 5 years (to be supplemented with future toll revenue)	$1.29
Expand Unitrans	Increase service frequency from 30 to 15 minutes during the morning and afternoon peak periods, Payment directly to an agency (UC Davis) for adding new buses; no physical improvements. Funding for partial payment for vehicle bridge overcrossing with bike lanes and sidewalks; there would be physical improvements; programmed by City of Davis - Nishi Development.	1.2 million	$875k (annual cost to expand service)	$3.5 million over 5 years (to be supplemented with future toll revenue)	$3.00

Mitigation Measure	Description	Annual VMT Reduced	Cost to Construct or Implement	Yolo 80 Managed Lane Contribution	$/VMT
Build Overcrossing at Future Nishi Student Housing Development Site	The overcrossing will include sidewalk and lighting to provide students with safe and direct access to and from the future Sustainable, affordable Nishi Student Housing Development and the UC Davis campus, and connects bike/ped users to the Olive Drive Trail System. The overcrossing is required to provide access to the land-locked parcel and is the first step in the Nishi Development's construction in the City of Davis.	0[1]	$18 million (preliminary cost estimate)	$5 million	N/A
Total	—	57.1 million (43% of induced VMT)	--	$55 million	

Source: Caltrans 2023f
Notes: Nishi Student housing is low auto dependent. The overcrossing is a necessary element as the parcel is landlocked by the railroad to the north, I-80 to the south, Richards Boulevard to the east and the railroad undercrossing with I-80 to the west. VMT reduction credit is not taken until the housing is complete. When the housing is complete, VMT reduction realized will be 14.6 million VMT.
Key: VMT = vehicle miles traveled

The Yolo 80 Managed Lanes Project VMT Mitigation Plan (Caltrans 2023f) lists additional VMT reducing measures that were analyzed and rejected as not reasonable or feasible, as shown in Table 2.1-28 below.

Table 2.1-28. Potential VMT Reducing Measures Analyzed and Rejected (Not Reasonable or Feasible)

Mitigation Measure	Description	Annual VMT Reduced	Cost to Construct or Implement	Yolo 80 ML Contribution	$/VMT
Increase Parking Costs	Double parking costs at UC Davis and Downtown Sacramento.	64.1 million	N/A (neither agency has a plan to proceed with this program, hence there is no cost)	N/A	N/A
Build 1,000 Housing Units in Downtown Davis	The Downtown Davis Specific Plan area is bounded by Union Pacific Railroad, 1st, A, and 5th Streets, and includes the G Street corridor. The proposed development would include up to 1000 housing units.	18.3 million	$25 million ($250k per unit to construct)	$5 million	$0.27

Mitigation Measure	Description	Annual VMT Reduced	Cost to Construct or Implement	Yolo 80 ML Contribution	$/VMT
Build 700 Housing Units at Nishi Development in City of Davis	Nishi property in Davis is bounded by I-80, Union Pacific Railroad, and Putah Creek. The proposed development would include up to 700 housing units for students at the adjacent UC Davis campus.	14.6 million	$175 million ($250k per unit to construct)	$5 million	$0.34
Expand Sidewalks in Yolo County	Increase sidewalk coverage by 10% throughout Yolo County.	13,6 million	N/A (agency has no plan to proceed with this program, hence there is no cost)	N/A	N/A
Build 4,442 Housing Units at Bridge District in West Sacramento	The Bridge District Specific Plan area is bounded by the Sacramento River, Tower Bridge Gateway, US 50, South River Road, and 15th Street. The proposed development would include up to 4,442 housing units.	8.4 million	$1.1 billion ($250k per unit to construct)	$5 million	$0.59
Green Line LRT Extension: Township 9 to Sac Airport	Extend the Green Line Light Rail Transit from Township 9 Boulevard to the Sacramento International Airport.	7.2 million	$1.2 billion (not feasible or reasonable for cost-to-VMT reduction benefit. Also, in MTP and project funding would only get partial VMT credit)	N/A	$166
Expand YoloBus Route 42	Increase Route 42A and Route 42B service for 15-minute headways during morning and afternoon peak hours.	4.7 million	$16 million annually ($320 million over 20 years, not feasible or reasonable for cost-to-VMT reduction benefit)	$80 million over 5 years	$16
Downtown Riverfront Streetcar	Construct and operate the proposed Downtown Riverfront Streetcar system from midtown Sacramento to West Sacramento City Hall along Broadway.	4.3 million	$259 million (not feasible or reasonable for cost-to-VMT reduction benefit. Also, in MTP and project funding would only get partial VMT credit)	N/A	$60
Truxel Road Bridge	Construct a two-lane multimodal bridge at the American River from Garden Highway to Sequoia Pacific Boulevard.	3.7 million	$217 million (not feasible or reasonable for cost-to-VMT reduction benefit. Also, in MTP and project funding would only get partial VMT credit)	N/A	$58

Mitigation Measure	Description	Annual VMT Reduced	Cost to Construct or Implement	Yolo 80 ML Contribution	$/VMT
Build 400 Housing Units in Downtown Sacramento	The proposed development would include up to 400 housing units in the Downtown Sacramento area bounded by J Street, 16th Steet, N Street, and 7th Street.	3.3 million	$100 million ($250k per unit to construct)	$5 million (YoloTD recommends Yolo County housing projects)	$1.51

Source: Caltrans 2023f

2.1.11 Visual and Aesthetics

2.1.11.1 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 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.

2.1.11.2 Affected Environment

Information in this section is based on the Visual Impact Assessment (VIA) prepared for the project in October 2021 and revised in March 2023 (Stantec 2023). The purpose of the VIA is to document potential visual impacts caused by the project and to propose measures to lessen impacts that are identified. Visual impacts are demonstrated by identifying visual resources in the project area, measuring the amount of change that would occur as a result of the project, and predicting how the affected public would respond to or perceive those changes.

Visual Resources

The Sacramento River, Sacramento River Corridor, and Yolo Bypass Wildlife Area (YBWA) were identified as areas of scenic value within the project area. The project crosses the

Sacramento River on I-80 and US-50, and the river corridor creates one of the primary natural scenic resources in Sacramento. The project crosses the YBWA on the Yolo Causeway which is elevated and provides open views of managed wildlife habitat and seasonal views of flooded riparian waterways.

Visual Character

Visual character includes attributes such as form, line, color, and texture; and they are used to describe, not evaluate. These attributes are neither considered good nor bad. However, a change in visual character can be evaluated when it is compared with the viewer response to that change. Changes in visual character can be quantified by identifying how visually compatible a project would be with the existing condition by using visual character attributes as an indicator. The following attributes were considered:

- Form: visual mass and 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: a variety of visual patterns
- Continuity: uninterrupted flow of form, line, color, or textural pattern

Visual Quality

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. The three criteria for evaluating visual quality are defined below:

- Vividness: the extent to which the landscape is memorable and is associated with distinctive, contrasting, and diverse visual elements.

- Intactness: the integrity of visual features in the landscape and the extent to which the existing landscape is free from non-typical visual intrusions.

- Unity: the extent to which all visual elements combine to form a coherent, harmonious visual pattern.

Visual Assessment Units

The project corridor was divided into a series of “outdoor rooms” or visual assessment units (VAU). Each VAU has its own visual character and visual quality. It is typically defined by the limits of a particular viewshed which collectively exhibit a similar overall character. For this project, the following four (4) VAUs and their associated key views (KVs) have been identified: Solano County, Davis, Yolo County, and West Sacramento (Figure 2.1-10). KVs represent the viewer groups that have the highest potential to be affected by the project considering exposure and sensitivity based on each Build Alternative. Each VAU is described below. Figure 2.1-10 illustrates the VAUs and respective KVs evaluated for the project.

Solano County Visual Assessment Unit

This VAU is located within the limits of Solano County, west of Davis limits. It extends from the project's western terminus (PM SOL 40.7) northeast along I-80 to south of the Yolo County/Davis limits (PM YOL 0.0) (see Figure 2.1-10).

This VAU was established based on common attributes which include land use (mostly agricultural), development density (comparatively lower than the adjacent VAUs), regulatory setting (Solano County), roadway cross section (no center median vegetation), and viewshed (higher frequency of distant views). These attributes combine to create a notably different visual setting than the adjacent VAU.

Davis Visual Assessment Unit

This VAU is located along I-80 from the UC Davis just south and east of the City of Davis boundary (PM YOL 0.0) and extends through the City of Davis to the eastern limits of the city (PM YOL 3.71) (See Figure 2.1-10).

This VAU was established based on common attributes which include land use (mostly suburban), development density (comparatively higher than the adjacent VAUs), regulatory setting (City of Davis), roadway cross section (presence of consistent median vegetation and roadside tree canopy), and viewshed (mostly enclosed roadway corridor with distant views uncommon).

Yolo County Visual Assessment Unit

This VAU is located along I-80 from the eastern limits of the Davis (PM YOL 3.71) spanning the Yolo Bypass to the western limits of West Sacramento (PM YOL 8.80) (See Figure 2.1-10).

This VAU was established based on common attributes which include land use (mostly wildlife preserve), development density (comparatively lower than the adjacent VAUs), regulatory setting (Yolo County), roadway cross section (no median vegetation or roadside tree canopy with an elevated roadway), and viewshed (frequent distant views available). These attributes combine to create a notably different visual setting than the adjacent VAU.

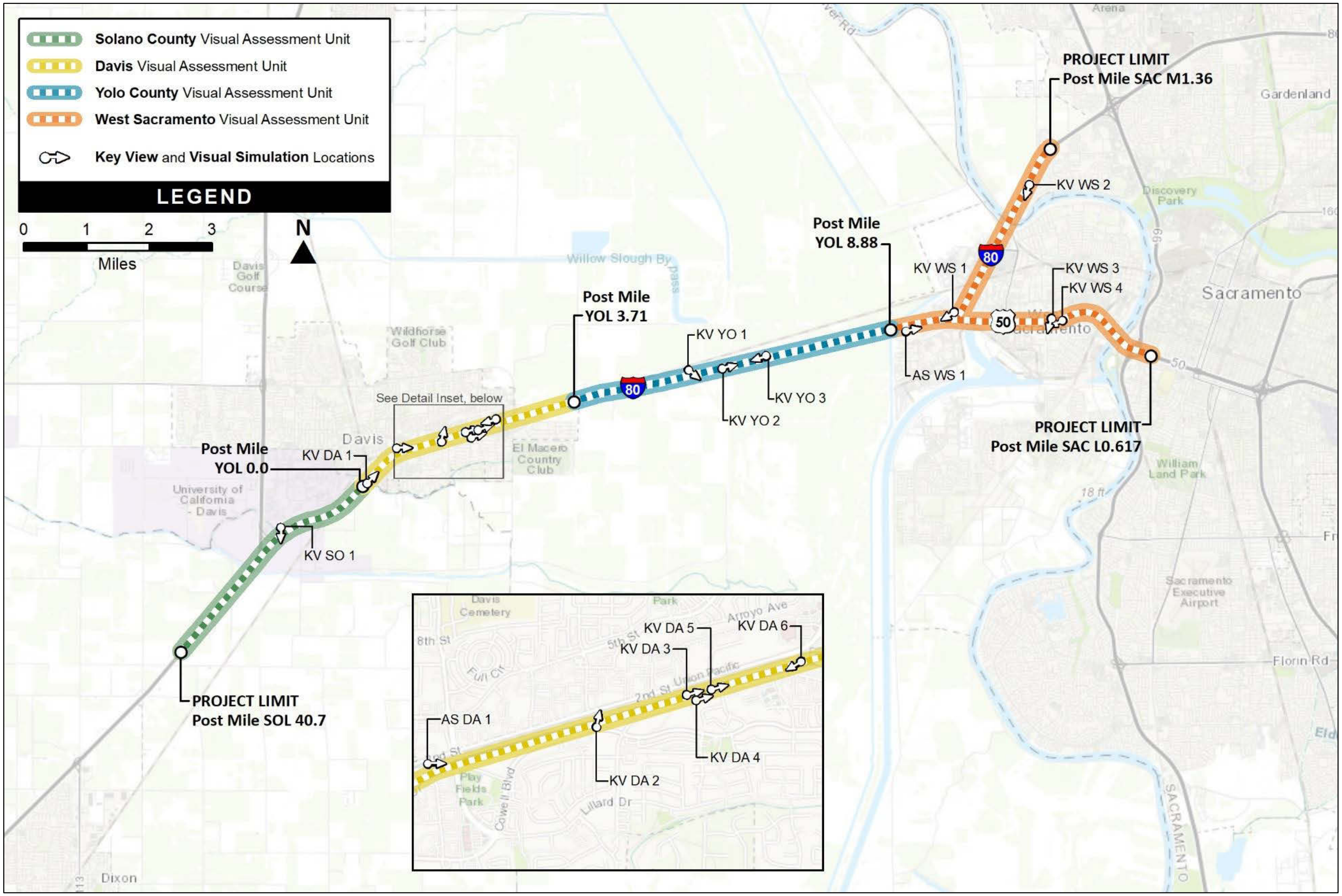


Figure 2.1-10 Visual Assessment Units and Key View Locations

West Sacramento Visual Assessment Unit

This VAU is located along the I-80/US-50 corridor within the city limits of West Sacramento and Sacramento, extending from the west boundary of West Sacramento (PM YOL 8.80) to the project's two eastern termini (PM SAC L0.78 and PM SAC M0.55) (See Figure 2.1-10).

This VAU was established based on common attributes which include land use (mostly suburban), development density (comparatively higher than the adjacent VAU), regulatory setting (West Sacramento and Sacramento), roadway cross section (road is at grade with sound walls more common), and viewshed (comparatively more enclosed roadway corridor with distant views less common). These attributes combine to create a notably different visual setting than the adjacent VAU.

Viewers

Viewer groups identified within the project area include highway neighbors and highway users. In general, highway neighbors have views to the road, and highway users have views from the road. Viewer sensitivity and exposure to proposed resource changes varies for each viewer group based on their level of awareness. As a result, potential visual concerns can be assumed for each viewer group in response to resource change.

Highway Neighbors

Highway neighbors are viewer groups with views to the road. They can be subdivided into different viewer groups by land use. The following highway neighbors were considered:

- Residential/Commercial property viewers
- Pedestrians and bicyclists
- Agricultural viewers
- Amtrak Capitol Corridor Commuters
- Yolo Bypass Wildlife Area viewers
- Industrial/Commercial property viewers

Highway Users

Highway users are viewer groups with views from the road. They can be subdivided into different viewer groups in two different ways—by mode of travel or by reason for travel. The following highway users were considered:

- Commuters
- Truck Drivers
- Recreational travelers (travel is primarily leisure and not related to work or other typical daily tasks)
- Pedestrians and bicyclists (on Yolo Causeway)

Visual Setting

Solano County Visual Assessment Unit

The majority of land directly abutting the highway (i.e., the east and west sides of the highway) is agricultural land, but it also includes views to and from the UC Davis Campus and Arboretum. Generally, views in this VAU include a large open space component with agricultural parcels and undeveloped landscape, with intermittent trees and other vegetation along the roadway partially screening views. Vegetation is most prominent at the UC Davis Arboretum, SR-113 Interchange, and riparian vegetation along Putah Creek. Some existing industrial and agricultural industrial development is present in the westernmost section of the VAU. The UC Davis Campus includes notable built forms that are visible for eastbound and westbound drivers, such as the Mondavi Center for Performing Arts, Mondavi Institute for Wine and Food Science, and the Manetti Shrem Museum of Art. These buildings are separated from the roadway by open space and appear in the middle-ground of the view from highway users. Multiple highway-facing advertising billboards are located along the roadway.

Visual character can be considered moderate, though it varies in this VAU from moderate-low to moderate-high. These ratings are tied to the relationship and comparative density of visual obstructions and vegetation, especially mature trees, which varies within the corridor. Where dense landscaping and/or mature vegetation is present, it softens the appearance, mass, scale, and dominance of visual intrusions, such as highway infrastructure and large built forms. These areas are considered to have moderate to moderate-high visual character. By contrast, visual character declines where dense landscaping and/or mature vegetation is absent, where billboards are present, and/or where the density of highway infrastructure is high within a particular view.

Visual quality in this VAU can be considered moderate, though it varies from moderate-low to moderate-high. Vividness is higher where dense landscaping and/or mature vegetation is present. Intactness and unity are correspondingly higher along these segments, since visibility of visual intrusions such as highway infrastructure and large built forms is limited, resulting in scenes composed of a strong linear element (the freeway) and consistent vegetative screening. This occurs most notably in this VAU at the Pedrick Interchange, at the SR-113/I-80 interchange, and at the UC Davis Arboretum. These areas are considered to have moderate to moderate-high visual quality. By contrast, visual quality declines where dense landscaping and/or mature vegetation is absent (lower vividness), where billboards are present (greater encroachment by features into the roadway corridor and interruption of visibility beyond the roadway corridor), where more industrial agricultural facilities are visible (resulting in a less unified composition) and/or where the density of highway infrastructure is high within a particular view (affecting both the memorability and intactness of views). Portions of the southern segment of this VAU that have one or more of these characteristics, and visual quality is generally lower as a result.

Davis Visual Assessment Unit

Foreground views of highway users are dominated by the paved roadway surface and related infrastructure such as overhead signage and lighting, which are softened by center median vegetation and a consistent planting of mature trees along both edges of the right-of-way in the corridor, which has a framing effect for highway users. Shoulder vegetation consists of deciduous and evergreen trees lining the highway, shrubs and grasses, and groupings of trees at interchanges. Views under the tree canopies to and from adjacent developments are consistently available since sound walls are uncommon. In the eastbound direction, partially screened views of residential development, commercial buildings and urban development occur where the plantings break. A railroad corridor runs east-to-west, parallel to I-80 from the VAU's eastern terminus to the Pole Line Road overpass. The rail corridor is partially screened by tree and shrub vegetation. Near Richards Boulevard in the westbound direction, there are trees planted in front of a sound wall; and partial views of the tops of residential and commercial buildings can be seen above the wall and trees.

Visual character can be considered moderate, though it varies from moderate-low to moderate-high. These ratings are tied to the relationship and relative density of visual obstructions and vegetation (especially mature trees) to each other, which varies in the corridor. Where dense landscaping and/or mature vegetation is present, it softens the appearance, mass, scale, and dominance of visual intrusions such as highway infrastructure and large built forms. These areas are considered to have moderate to moderate-high visual character. By contrast, visual character declines where dense landscaping and/or mature vegetation is absent, where the center median vegetation is absent or in poor health, and/or where the density of highway infrastructure is high within a particular view.

Visual quality in this VAU can be considered moderate to moderate-high, though it varies from moderate-low to moderate-high. These ratings are tied to the relationship and comparative density of visual obstructions and vegetation (especially center median vegetation and mature trees), which varies within the corridor. Where dense landscaping and/or mature trees and other vegetation are present, views have a higher degree of vividness, along with an intactness and unity that reflect the reduced visibility of other features (infrastructure and other built forms) alongside or just outside of the roadway corridor. When in bloom, the dense median oleander increases the vividness of the corridor as well. These areas are considered to have moderate to moderate-high visual quality depending on the position of the viewer. By contrast, visual quality declines where dense landscaping and/or mature vegetation is absent (allowing for visual intrusion by other elements, reducing intactness and overall unity of views), where the center median vegetation is absent or in poor health (reduced vividness), and/or where the density of highway infrastructure is high within a particular view, reducing the intactness compared with other segments where linear components appear uninterrupted. The westernmost section of this VAU near the Richards Boulevard interchange and a few select gaps where fire has damaged the median planting have lower visual quality because the absence of median planting increases the visibility of highway infrastructure.

Yolo County Visual Assessment Unit

Foreground views of highway users in this VAU are dominated by the paved roadway surface and related infrastructure such as fencing along the bicycle path on the westbound side of the highway. Middle ground views of highway users are dominated by distant views of fields, rural agricultural, and open spaces with some groupings of mature trees. There are views of overhead utility and transmission lines parallel and crossing above the highway. From CR-32A to West Sacramento, middle ground views of highway users in this VAU are dominated by distant views of the natural landscape, including wet-lands, uplands, floodplains, fields, levees, and riparian habitats, with distant views of urban development and views of the city skyline.

Visual character can be considered moderate, though it varies in this VAU from moderate-low to moderate-high. These ratings are tied to the relationship and relative density of visual obstructions to each other, e.g., signage, fencing, overhead utilities, vegetation (especially mature trees), and open water, which varies within the corridor. Where mature vegetation is present, it softens the appearance, mass, scale, and dominance of visual intrusions such as highway infrastructure and large built forms. These areas are considered to have moderate to moderate-high visual character. This VAU has unique varying and seasonal views of open water when the YBWA is being managed for habitat and/or as a floodway during the rainy season. Visual character declines where the utility and highway infrastructure are present within a particular view.

Visual quality can be considered moderate, though it varies in this VAU from moderate-low to moderate-high. Similar to assessments of visual character, these ratings are tied to the relationship and relative density of visual obstructions to each other, e.g., signage, fencing, overhead utilities, vegetation (especially mature trees), open water, and views of the City skyline, which varies within the corridor. Where dense landscaping, open water views, and/or mature vegetation are present, it adds elements of vividness to the view. Intactness is comparatively higher in such locations as well, where the linear roadway passes through and over generally rectilinear farmland and more natural appearing waterways with little overlap or encroachment observable. This VAU generally lacks mature vegetation, though a large eucalyptus stand and some oak plantings are present. Views of open water to the south are seasonal, and more common in the winter and spring. Views to the City skyline are limited to eastbound traffic and are best in the afternoon and evenings when the sun is behind the viewer. Where one or more of these are present, visual character can be moderate to moderate-high. Visual quality declines where the utility and highway infrastructure are present within a particular view. Overhead utilities and highway signage are relatively infrequent within this VAU; but where they are present, visual quality declines.

West Sacramento Visual Assessment Unit

The segment of I-80 from the interchange to the eastern terminus of the project is elevated or above-grade with three lanes in each direction and paved shoulders in each direction. This segment of I-80 has a continuous paved and unpaved median; there is also a median barrier along the edges of pavement for a majority of the segment. At the elevated crossing over the Sacramento River, the highway splits into separate bridges for each direction of traffic and joins again east of the Sacramento River crossing. From east of the Sacramento River crossing to the project terminus, the center median contains a vertical concrete barrier separating directions of traffic. Roadway lighting is minimal for most of the segment. This segment of I-80 is elevated over West Capitol Avenue, a railroad, Garden Highway, and the Sacramento River. Overhead utility lines cross I-80highway in a few locations and run adjacent to I-80.

The segment of US-50 from the I-80/US-50 to the eastern terminus of the project is generally four lanes in each direction in Yolo County, and it reduces to three lanes in each direction at approximately the Sacramento County line. The road is elevated over Westacre Road, at grade under Harbor Boulevard overpass, elevated and under the SR-275 on-ramp, and elevated over SR-84, Soule Street, and the Sacramento River. The travel directions are separated by a paved center median with a vertical concrete median barrier. Roadway lighting is spaced evenly at approximately 140-foot intervals where present. Sound walls are located on both sides of the highway throughout portions of this segment.

Foreground views of highway users in this VAU are dominated by the paved roadway surface and related infrastructure such as overhead signage, roadway lighting, concrete medians, sound walls, and overhead utility lines. Views in this VAU vary where the highway is elevated or above-grade, such as over train tracks or the Sacramento River. At the I-80/US-50 interchange, views include Prospect Slough, distant views of field and agricultural, and industrial commercial development partially screened by trees and other vegetation. Other views in this VAU include drainages, canals, levees, and the Sacramento River.

Middleground views of highway users in the I-80 section of the VAU consist primarily of the tops of the adjacent commercial and industrial development and large parking lots where the highway is elevated. Sound walls are common adjacent to residential areas which screen views to/from the freeway. Vegetation in this VAU are largely trees, shrubs, and grasses on either side of the corridor. Views in this VAU also contain lighting associated with nearby businesses and residences (including interior and exterior building lighting, overhead lighting within parking lots, and roadway lighting) is minimal to non-existent on the I-80 section of the VAU.

Middleground views of highway users in the US-50 section of this VAU consist primarily of the paved roadway surface and related infrastructure, such as overhead signage, roadway lighting, concrete medians, sound walls, and overhead utility lines. Views are of predominantly low-rise industrial and commercial uses, large parking lots, buildings and signage associated with the adjacent industrial and commercial land uses, and billboards. Sound walls screen development through much of the segment; there the tops of trees and commercial signage visible above the sound walls. Vegetation consists of grasses, trees at grade, or tops of trees above sound walls.

Visual character can be considered moderate, though it varies in this VAU from moderate-low to moderate-high. These ratings are tied to the relationship and relative density of visual obstructions and vegetation (especially mature trees) to each other, which varies in the corridor. Where dense landscaping and/or mature vegetation is present, it softens the appearance, mass, scale and dominance of visual intrusions, such as highway infrastructure, overhead utilities, sound walls, industrial areas, and large built forms. These areas are considered to have moderate to moderate-high visual character. By contrast, visual character declines where dense landscaping and/or mature vegetation is absent, sound walls are present without vines and/or landscaping, and/or where the density of highway or utility infrastructure is high within a particular view.

Visual quality can be considered moderate, though it varies in this VAU from moderate-low to moderate-high. These ratings are tied to the relationship and relative density of visual obstructions and vegetation (especially mature trees) to each other, which varies in the corridor.

Where dense landscaping, river views, Sacramento skyline views and/or mature vegetation are present, they add elements of vividness to the view while also reducing visibility of or drawing attention away from visual intrusions such as highway infrastructure, overhead utilities, sound walls, and industrial areas. The US-50/I-80 interchange has ornamental planting which helps increase the visual quality of the interchange. Where US-50 crosses the Sacramento River, it offers vivid views of the downtown Sacramento skyline and the Sacramento River. Where I-80 crosses the Sacramento River, visual quality is increased by the presence of dense riparian vegetation and river views. View unity is drawn from the experience of traveling a landscaped roadway within an urbanized setting. These areas are considered to have moderate to moderate-high visual quality. By contrast, visual quality declines where dense landscaping and/or mature vegetation is absent, sound walls are present without vines and/or landscaping, large overhead powerlines are present, sound walls have graffiti or patches of graffiti cover-up paint, and/or where the density of highway or utility infrastructure is high within a particular view. Intactness is reduced by the increased visibility of multiple forms within or alongside the roadway corridor, and the unity described above is less present in these segments. Further, many of the sound walls in the US-50 corridor appear to have experienced issues with vandalism. The area between the Yolo Causeway and the US-50/I-80 interchange generally experiences lower visual quality due to dominant freeway infrastructure, presence of overhead utilities, industrial land uses, large sound walls, and the lack of vegetation.

2.1.11.3 Environmental Consequences

No Build Alternative 1

Construction and Operation

Under the No Build Alternative 1, managed lanes and transportation improvements would not be constructed or operated. As such, no change to visual and aesthetics resources would occur.

Build Alternatives 2a and 2b

Construction

For Build Alternatives 2a and 2b, highway users would experience short-term visual impacts as a result of construction. Construction equipment would add visual intrusion and disturbances to the corridor and would reduce the intactness and unity of the visual resources in the study area during the period of construction. Equipment and machinery would be stationed at staging areas within the project limits, and traffic control signage would be used as needed. Temporary sources of light and glare would be added to the project area during the construction phase; however, they would be minimized through use of standard construction equipment, protocols, and appropriate light and glare screening measures, including Standard Measure AR-4 and AMM AES-1, which would limit construction lighting and avoid or minimize glare through selection of materials and finishes, respectively.

Duration of construction is expected to vary by alternative and range from 22 to 36 months. Temporary visual effects from construction would be typical of any major corridor improvement project and are not considered to be substantial nor significantly contribute to a permanent effect. Measures are proposed to reduce the impacts from temporary construction.

Operation

Resource Changes for Build Alternative 2a include adding managed lanes on I-80 and US-50. New lighting is proposed at the auxiliary lane in the Solano County and Davis VAUs, the Bryte Bend Bridge in the West Sacramento VAU, and the new bike path at the CR-32A exit in the Yolo County VAU. Existing ITS elements and infrastructure would be expanded and modified and would include ramp meters, fiber-optic conduit and cables, and overhead signs. Overall visual impacts for Build Alternative 2a would be moderate-low but would range from very low to moderate-high.

Build Alternatives 2a and 2b would require tree removal or other vegetative clearing to accommodate road widening, work areas, staging, and installation of fiber optic cable. The increase in roadway infrastructure components coupled with the loss of vegetation would alter the character of the corridor toward a more urbanized aesthetic in areas that are currently more naturalized and suburban in overall character.

Visual impacts for Build Alternative 2b would include additional impacts related to the I-80 connector structure in the West Sacramento VAU. Resource changes would occur over the course of approximately 1 mile and include the addition of new walls in the center median of the freeway, a new I-80 connector structure, removal of additional trees, and creation of a new earthen berm at the I-80/US-50 interchange. Visual impacts related to this feature would be moderate-high. The increased impacts associated with this segment would elevate the impacts of each Build Alternative 2a counterpart. Build Alternative 2b impacts would be moderate-high. Implementation of AMM AES-3 would replace highway plantings and vegetation, including oleander. Landscaping and revegetation plans would be prepared to maintain, repair, and expand corridor landscaping and vegetation where proper setbacks exist and where feasible.

The project would implement measures to reduce the potential visual effects of the project by design. Such measures include aesthetic treatment of new structures (Standard Measure AR-1), restoring vegetation and natural contour for temporary access roads, construction easements, and staging areas that were previously vegetated (Standard Measure AR-2), burying guardrail terminals (Standard Measure AR-3), limiting construction lighting (Standard Measure AR-4), and minimizing removal of established trees and vegetation where feasible (Standard Measure AR-5). AMM AES-4 would reduce views of any new overhead signage that may be proposed on the I-80 connector structure. AMM AES-5 would refine the design of the I-80 connector structure to prioritize solutions which reduce visual impacts and limit potential to require powerline relocation.

The rock slope protection strategies proposed primarily in the area of the new bike lane extension of CR-32A have the potential to degrade the existing visual character and quality of public views of the site and its surroundings. However, AMM AES-2 would minimize high-contrast rock slope protection by specifying rock colors and/or stains which match or complement the predominant immediately adjacent landscape color. Alternatively, planted options at this location would be considered.

With implementation of AMM AES-1 through AMM AES-5, Build Alternatives 2a and 2b would not cause disproportionately high and adverse direct effects on visual resources.

Build Alternatives 3a and 3b

Construction and Operation

Build Alternatives 3a and 3b would involve adding an HOT2+ lane in each direction. Build Alternatives 3a and 3b propose similar project components within the same project area as Build Alternatives 2a and 2b; however, they would include additional impacts related to 35 additional overhead pricing signs. The presence of these additional signs would reduce visual quality and character in the vicinity to which they are introduced and would increase the visual impacts of the project. Implementation of AES AMM-4 would reduce the magnitude of these effects by requiring that the location of all new overhead signage and read points be reviewed and that sensitive locations are avoided or screened to the extent possible. Furthermore, read points would be integrated into existing and proposed overhead structures where feasible. Overall visual impacts would be moderate but would range from low to moderate-high. Alternative 3b impacts would be moderate-high to high. With implementation of AMM AES-1 through AMM AES-5, Build Alternatives 3a and 3b would not cause disproportionately high and adverse direct effects on visual resources.

Build Alternatives 4a and 4b

Construction and Operation

Build Alternatives 4a and 4b would involve adding an HOT2+ lane in each direction. Build Alternatives 4a and 4b propose similar project components within the same project area as Build Alternatives 2a and 2b; however, they would include additional impacts related to 35 additional overhead pricing signs. The presence of these additional signs would reduce visual quality and character in the vicinity to which they are introduced and would increase the visual impacts of the project. Overall visual impacts would be moderate but would range from low to moderate-high. Alternative 4b impacts would be moderate-high to high. With implementation of AMM AES-1 through AMM AES-5, Build Alternatives 4a and 4b would not cause disproportionately high and adverse direct effects on visual resources.

Build Alternatives 5a and 5b

Construction and Operation

Build Alternatives 5a and 5b would involve adding an HOT2+ lane in each direction. Build Alternatives 5a and 5b propose similar project components within the same project area as Build Alternatives 2a and 2b; however, they would include additional impacts related to 35 additional overhead pricing signs. The presence of these additional signs would reduce visual quality and character in the vicinity to which they are introduced and would increase the visual impacts of the project. Overall visual impacts would be moderate but would range from low to moderate-high. Alternative 5b impacts would be moderate-high to high. With implementation of AMM AES-1 through AMM AES-5, Build Alternatives 5a and 5b would not cause disproportionately high and adverse direct effects on visual resources.

Build Alternatives 6a and 6b

Construction and Operation

Build Alternatives 6a and 6b propose similar project components within the same project area as Build Alternatives 2a and 2b. Overall visual impacts would be moderate-low but would range from very low to moderate-high. Build Alternative 6b impacts would be moderate-high. With implementation of AMM AES-1 through AMM AES-5, Build Alternatives 6a and 6b would not cause disproportionately high and adverse direct effects on visual resources.

Build Alternatives 7a and 7b

Construction

Construction-related impacts are lowest in Alternative 7a, where reduced impacts occur in the Davis VAU since the center median work would not be performed and the construction schedule would be shortened. However, construction-related impacts are highest in Build Alternative 7b where the I-80 connector structure would be built in the West Sacramento VAU, increasing the schedule to 42 months and including the use of a crane.

Operation

Resource changes for Build Alternative 7a are the same as Build Alternative 2a but would include converting an existing lane into a managed lane on I-80 and US-50 with no shoulder widening or median reconstruction with a concrete barrier. The reduction in impacts would primarily be from highway users in the Davis VAU, where the median plantings would be retained and the vegetation contributions to visual character and quality would be retained. Overall visual impacts of Build Alternative 7a would be low but would range from very low to moderate-high. Build Alternative 7b impacts would be moderate to moderate-high. With implementation of AMM AES-1 through AMM AES-5, Build Alternatives 7a and 7b would not cause disproportionately high and adverse direct effects on visual resources.

2.1.11.4 Avoidance, Minimization, and/or Mitigation Measures

AMMs have been specified to reduce, avoid, and offset visual impacts from the project.

The following would be designed and implemented into the project, with concurrence of the District Landscape Architect, as applicable. The following measures to avoid or minimize visual impacts would be incorporated into the project:

- **AMM AES-1: Avoid or minimize glare through the selection of materials and finishes**. Implement paint finishes that are only matte, satin, or non-glare producing. Concrete colors/finishes would be selected to reduce their potential to become a source of glare.
- **AMM AES-2: Minimize high contrast rock slope protection:** Colors and/or stains that match or complement the predominant immediately adjacent landscape color would be used where stormwater energy dissipation and/or slope stabilization devices are used.

- **AMM AES-3: Account for the loss of plantings and vegetation by providing replacement highway plantings and vegetation.** Plans would be prepared which maintain and repair corridor landscaping and vegetation where proper setbacks exist and where feasible. Plans would help ensure work within any existing classified landscape freeway maintains the status of the landscaped freeway. Appropriate replacement planting would be provided when existing planting (including oleander) is removed to a level considered roughly proportionate, with a target of 100%/1:1 and not less than 60%. Plantings would occur as close to the original impacts as possible. When native, naturally occurring or specimen trees are removed, replacement plantings would reflect the visual importance of the plantings lost.
- **AMM AES-4: Reduce views of new overhead signage and read points from visually sensitive locations.** Where new overhead signage and/or read points are proposed, consider refinements to their final location to avoid or screen direct views from sensitive viewsheds such as those of homeowners and recreationalists. Integrate read points into existing and proposed overhead structures where feasible.
- **AMM AES-5: Minimize I-80 connector structure design profile.** The I-80 connector structure design refinements would be prioritized to minimize its prominence, scale, and mass and avoid the need to raise/relocate adjacent powerline towers.

2.1.12 Cultural Resources

2.1.12.1 Regulatory Setting

The term “cultural resources,” as used in this document, refers to elements that constitute the “built environment” (which comprises buildings; objects, structures such as bridges; and linear features such as railroads, water conveyance systems, etc.), places of traditional or cultural importance, and archaeological sites (both prehistoric and historic), regardless of their 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 dealing with historic properties, which are 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 Section 106 Programmatic Agreement (PA) among the Federal Highway Administration (FHWA), the ACHP, the California State Historic Preservation Officer (SHPO), and Caltrans went into effect for Caltrans projects, both state and local, with FHWA involvement. The PA implements the ACHP’s regulations, 36 CFR 800, streamlining the Section 106 process and delegating certain responsibilities to Caltrans. The FHWA’s responsibilities under the PA have been assigned to Caltrans as part of the Surface Transportation Project Delivery Program (23 United States Code [USC] 327).

Historic properties may also be covered under Section 4(f) of the U.S. Department of Transportation Act, which regulates the "use" of land from historic properties (in Section 4(f) terminology—historic sites). See Appendix A for specific information about the applicability of Section 4(f) to historic properties.

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 eligible for listing in the CRHR and, therefore, to be considered a historical resource. Historical resources are defined in PRC Section 5020.1(j). In 2014, Assembly Bill 52 (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 adverse effects to them). Defined in PRC Section 21074(a), a tribal cultural resource is a CRHR or local register eligible site, feature, place, cultural landscape, or object which has a cultural value to a California Native American tribe. Tribal cultural resources must also meet the definition of a historical resource. Unique archaeological resources are referenced in PRC Section 21083.2.

PRC Section 5024 requires state agencies to identify and protect state-owned historical resources that meet the NRHP listing criteria. It further requires Caltrans to inventory state-owned historical resources 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) between Caltrans and SHPO, effective January 1, 2015. For most Federal-aid projects on the State Highway System, compliance with the PA will satisfy the requirements of PRC Section 5024.

2.1.12.2 Affected Environment

Analysis of the cultural resources for the project was carried out by Caltrans Professionally Qualified Staff (PQS) in a manner consistent with Caltrans regulatory responsibilities under the PA. Methods used to support the studies for the analysis include records searches, field surveys including Phase I pedestrian surveys and Extended Phase I testing, field testing and Native American consultation with tribal entities (Table 2.1-29).

The Native American Heritage Commission (NAHC) was contacted May 14, 2020, to request a search of the Sacred Land Files and request a list of Native American tribes or individuals with potential interests, concerns, and/or knowledge regarding cultural resources or Traditional Cultural Properties that may be affected by the project. Of the 11 tribes originally identified by the NAHC, all responded and requested to continue consultation except for the Ione Band of Miwok Indians, the Nashville Enterprise Miwok-Maidu-Nishinam Tribe, the Ts'i Akim Maidu, and the Cortina Rancheria-Kletsel Dehe Band of Wintun Indians.

Table 2.1-29. Section 106 Technical Reports

Report Title	Date
Historic Property Survey Report	August 2021
Archaeological Survey Report	March 2021
Historic Resources Evaluation Report	August 2021
Extended Phase I Report	November 2020 and May 2021
Finding of No Adverse Effect	October 2021

Formal consultation began on June 4th, 2020 and was followed up by phone calls and/or emails to the Native American contacts who were identified as having an interest in projects within this area by the NAHC:

- Rhonda Morningstar Pope, Chairperson, Buena Vista Rancheria of Me-Wuk Indians
- Clyde Prout, Chairman, Colfax-Todds Valley Consolidated Tribe
- Sara Dutschke Setchwaelo, Chairperson, Ione Band of Miwok Indians
- Cosme Valdez, Chairperson, Nashville Enterprise Miwok-Maidu-Nishinam Tribe
- Regina Cuellar, Chairperson, Shingle Springs Band of Miwok Indians
- Grayson Coney, Cultural Director, Ts'i Akim Maidu
- Gene Whitehouse, Chairperson, United Auburn Indian Community of the Auburn Rancheria
- Raymond Hitchcock, Chairperson, Wilton Rancheria
- Anthony Roberts, Chairperson, Yocha Dehe Wintun Nation
- Charlie Wright, chairperson, Cortina Rancheria-Kletsel Dehe Band of Wintun Indians
- Marlene Sanchez, Chairperson, Guidiville Indian Rancheria

The Colfax-Todds Valley Consolidated Tribe noted that they would like to defer to a tribe more familiar with the project area. Buena Vista Rancheria of Me-Wuk Indians reviewed the project and did not request additional consultation but requested to be notified if any cultural resources are documented. Guidiville Indian Rancheria had no concerns and requested copies of the reports to add to their records.

Shingle Springs noted areas of concern and asked for continued consultation. United Auburn Indian Community notes areas of concern and requested to monitor testing. The Yocha Dehe Wintun Nation noted areas of concern requested to monitor testing. Wilton Ranchera also noted areas of concern and a desire to continue consultation. A joint meeting was held with concern tribes were project details and areas of concern were discussed. Consultation continued in the form of emails, phone calls, and online meetings with all concerns parties as the project developed.

The Yocha Dehe Wintun Nation provided a monitor for the XPI trenching, and UAIC monitored Geotech work at Bryte Bend bridge. Following the negative results from surveys and subsurface testing, no additional concerns were raised about the potential to affect historic properties within the project limits.

Responses were not received from the other identified parties.

Area of Potential Effects

The Area of Potential Effects (APE) is the area studied for cultural resources present in the general project area and which may extend beyond the boundary of the project study area. The APE is defined to avoid impacts to cultural resources when feasible, and where avoidance did not conflict with the purpose and need of the proposed project. The APE aligns with the cultural resources study area and project study area and is the same among all project alternatives. It consists of a broad corridor that encompasses existing and proposed new right-of-way as well as lands that may be used during construction but are not included in the final right-of-way. As defined by Caltrans for the project, the project study area comprises the entire APE, totaling 1,475 acres.

Cultural Resources

The Caltrans Office of Cultural Resources Studies conducted research, architectural history surveys, extended phase I studies, and evaluations of cultural resources within the APE in various dates in 2021. Identification and evaluation efforts by Caltrans have resulted in the documentation of one historic property within the APE: Reclamation District 900 (RD 900). Caltrans assumed RD 900 to be eligible for listing in the National Register under Criterion A, for the purposes of this project only, pursuant to Stipulation VIII.C.4 of the PA. On August 9, 2021 Caltrans Cultural Studies Office granted permission to assume the resource's eligibility.

Seven built-environment resources were also identified within the APE (MR1, MR2, MR3, MR4, MR5, MR6, and MR7); however, Caltrans determined all are ineligible for inclusion in the NRHP/CRHR. On September 30, 2021, Caltrans received concurrence from SHPO that the seven built environment resources were ineligible.

In addition, several cultural resources were identified within the APE but were considered to be exempt from evaluation pursuant to Attachment 4 of the Section 106 Programmatic Agreement (Properties Exempt from Evaluation) and as applicable PRC 5024 MOU Stipulation VIII.C.1 and Attachment 4.

Reclamation District 900 (RD 900) will be avoided the project, and the character defining features for which it is assumed eligible—as a large linear resource associated with historic themes of agriculture/irrigation and land reclamation in the Sacramento Valley—will not be affected. As such, Caltrans, pursuant to PA Stipulation X.B.2, found that there will be no adverse effect. The undertaking will not destroy or alter any contributing feature of RD 900 and will not affect the resource's integrity or ability to convey its historical significance, and the project would have No Adverse Effect without standard conditions.

SHPO concurred with the findings on January 12, 2022. As such, the undertaking would not result in any Section 4(f) use or *de minimis* finding to any historic properties or historical resources, regardless of alternative.

2.1.12.3 Environmental Consequences

No Build Alternative 1

Construction and Operation

Under the No Build Alternative, managed lanes would not be added to the I-80 or US-50 corridors and existing capacity would not increase. No ground disturbing activities would occur. Therefore, there would be no effects related to cultural resources.

Build Alternatives 2a and 2b

Construction

Build Alternatives 2a and 2b would involve adding an HOV 2+ lane in each direction. As described previously, of the cultural resources identified within the APE, and seven cultural resources were evaluated and determined to be ineligible for inclusion to the NRHP/CRHR and one cultural resource, the RD 900 canal, was assumed to be eligible for the purpose of the undertaking.

Project construction would create subsurface disturbances that could result in damage to or destruction of previously undiscovered subsurface archaeological deposits or unmarked burials. Although all the areas of construction and access roads have been subject to the cultural resources survey, the potential remains for previously unidentified archaeological remains to be discovered below the visible ground surface.

If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area would be diverted until a qualified archaeologist can assess the nature and significance of the find as outlined in Standard Measure CR-3 . Standard Measure CR-4 outlines requirements in the event human remains are discovered.

If human remains are discovered, all work within 60 feet of the discovery would halt and Caltrans' Cultural Resource Studies office would be called. Caltrans' Cultural Resources Studies Office Staff would assess the remains and, if determined human, would contact the County Coroner as per Public Resources Code (PRC) Sections 5097.98, 5097.99, and 7050.5 of the California Health and Safety Code. If the Coroner determines the remains to be Native American, the Coroner will contact the Native American Heritage Commission who would then assign and notify a Most Likely Descendant. Caltrans would consult with the Most Likely Descendant on respectful treatment and reburial of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.

Caltrans, pursuant to Section 106 PA Stipulation X.B.2, found that there would be no adverse effect. The undertaking would not destroy or alter any contributing feature of RD 900 and would not affect the resource's integrity or ability to convey its historical significance.

Operation

Operation of Build Alternatives 2a and 2b would not require earth-moving activity or ground disturbance. While capacity of the bridge would increase, which could result in increased noise effects, and changes to existing visual character and quality would occur, there would be no adverse effect to cultural resources within the APE.

Build Alternatives 3a and 3b

Construction and Operation

Build Alternatives 3a and 2b would involve adding an HOT 2+ lane in each direction. Because Build Alternatives 3a and 3b would be located in the same project area as Build Alternatives 2a and 2b, respectively, the effect would be the same as the effects described under Build Alternatives 2a and 2b.

Build Alternatives 4a and 4b

Construction and Operation

Build Alternatives 4a and 4b would involve adding an HOT 3+ lane in each direction. Because Build Alternatives 4a and 4b would be located in the same project area as Build Alternatives 2a and 2b, respectively, the effect would be the same as the effects described under Build Alternatives 2a and 2b.

Build Alternatives 5a and 5b

Construction and Operation

Build Alternatives 5a and 5b would involve adding an Express Lane in each direction. Because Build Alternatives 5a and 5b would be located in the same project area as Build Alternatives 2a and 2b, respectively, the effect would be the same as the effects described under Build Alternatives 2a and 2b.

Build Alternatives 6a and 6b

Construction and Operation

Build Alternatives 6a and 6b would involve adding a transit-only lane in each direction. Because Build Alternatives 6a and 6b would be in the same project area as Build Alternative 2a and 2b, respectively, the effect would be the same as the effects described under Build Alternatives 2a and 2b.

Build Alternatives 7a and 7b

Construction and Operation

Build Alternatives 7a and 7b involves repurposing the current number 1 general purpose lane to HOV 2+. No new lanes would be constructed. Because Build Alternatives 7a and 7b involves ground disturbing activities, the effect would be the same as the effects described under Build Alternatives 2a and 2b.

2.1.12.4 Avoidance, Minimization, and/or Mitigation Measures

No AMMs or MMs are required.

2.2 Physical Environment

2.2.1 Hydrology and Floodplain

2.2.1.1 Regulatory Setting

Executive Order (EO) 11988

Executive Order (EO) 11988 (Floodplain Management) directs all federal agencies to refrain from conducting, supporting, or allowing actions in floodplains unless it is the only practicable alternative. The 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 1 percent chance of being exceeded in any given year.” An encroachment is defined as “an action within the limits of the base floodplain.”

Section 408

The purpose of a Section 408 Permission is to demonstrate that any proposed work “will not be injurious to the public interest and will not impair the usefulness of the civil works project.” If that can be shown, the project would receive a Section 408 permission from the United States Army Corps of Engineers (USACE) and a Central Valley Flood Protection Board (CVFPB) permit before construction begins.

2.2.1.2 Affected Environment

This section was prepared using the Floodplain Hydraulics Study prepared for this project (Caltrans 2021b).

FEMA Flood Zones

The project is located in areas designated by the Federal Emergency Management Agency (FEMA) as Special Flood Hazard Area (SFHA) Zone A, SFHA Zone AE, and SFHA Zone 99A (Figure 2.2-1). Additionally, the project is also located within areas designated by FEMA as Other Areas of Flood Hazard Zone X (both shaded and unshaded). FEMA uses Zone A to characterize areas subject to inundation by the 1 percent annual chance flood (100-year flood) where no Base Flood Elevations (BFEs) have been determined. FEMA uses Zone AE to characterize areas subject to inundation by the 1 percent annual chance flood (100-year flood) where BFEs have been determined. FEMA uses Zone A99 to characterize areas to be protected from the 1 percent annual chance flood by a Federal flood protection system under construction where no BFEs have been determined. FEMA uses shaded Zone X to characterize areas of 0.2 percent annual chance flood (500-year flood); areas of 1 percent annual chance flood (100-year flood) with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from the 1 percent annual chance flood (100-year flood). FEMA uses unshaded Zone X to characterize areas determined to be outside of the 0.2 percent annual chance flood (500-year flood).

Section 408

Between PM 5.8 and 8.9, I-80 crosses the Yolo Bypass. The west and east levees of the Yolo Bypass, located at PM 5.8 and 8.9 respectively, are State Plan of Flood Control Levees and are part of the Sacramento River Flood Control Project. Consequently, the levees are under the jurisdiction of both the CVFPB and the USACE.

2.2.1.3 Environmental Consequences

No Build Alternative 1

Under No Build Alternative 1, managed lanes would not be added to the I-80 or US-50 corridors, and existing capacity would not increase. No ground-disturbing activities would occur. Therefore, No Build Alternative 1 would not have any new effects related to floodplains.

Build Alternatives 2a and 2b

Construction

The proposed bike path extensions for Build Alternatives 2a and 2b, involving rehabilitation of the existing bike path on the crown of the west levee of the Yolo Bypass, classifies the project as falling under the jurisdiction of Section 408. Therefore, Caltrans would need to receive an encroachment permit from the CVFPB and a Section 408 permission from the USACE prior to construction of Build Alternatives 2a and 2b.

New drainage inlets and culverts are proposed to be replaced or repaired to accommodate areas where existing shoulders are being narrowed, to accommodate additional runoff due to the increased pavement area, or to perpetuate existing drainage patterns. Build Alternatives 2a and 2b would construct five new culverts and replace or improve 21 existing culverts. As described, many of the proposed drainage features would be located within the construction footprint of the median for the new HOV 2+ managed lane. In addition, proposed culverts would traverse beneath the freeway to convey drainage to a new outlet. Proposed drainage features for the I-80 managed lane direct connector, under Build Alternative 2b, would occur within the construction footprint of the I-80 managed lane direct connector.

Operations

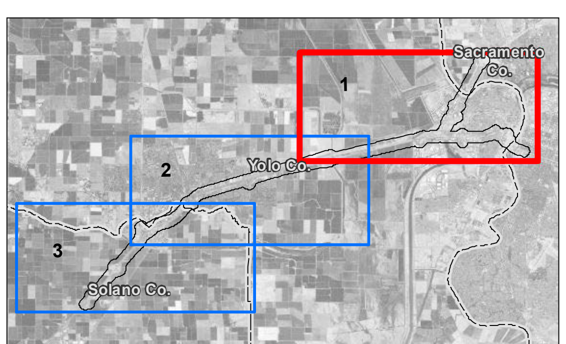
Build Alternatives 2a and 2b would involve adding an HOV lane in each direction for use by HOV 2+. Most of the project work would occur entirely within the existing Caltrans right-of-way and would not result in any changes to hydrology adjacent to the project area.

The Hydrology Study (Wood Rodgers 2022) determined the magnitude of increased peak flow rates arriving at existing drainage infrastructure caused by the proposed project improvements. Under Build Alternatives 2a and 2b, AMM HF-1 would be used to reduce the potential for adverse impacts resulting from increased peak flow. AMM HF-1 would require installation of a detention basin riser to tie into existing storm drains on the upstream side at two locations in Davis—one detention basin rise inlet is proposed at the storm drain crossing on Mace Boulevard south of I-80 and the other would be at the westbound I-80 off-ramp to Chiles Road.

The bike path extension design option for Build Alternatives 2a and 2b would occur within an SFHA, specifically within Zone A floodplains. This would be a transverse encroachment into the floodplain and would be identical at each bridge location. Accordingly, Build Alternatives 2a and 2b encroach transversely into the floodplains and would not raise or change the profile of any of the highway. It is anticipated that there would be no adverse effects on the FEMA-mapped floodplain in this area.

Build Alternative 2b proposes to construct a concrete median barrier on I-80 in Yolo County from PM 0.21 to PM 4.3 (a median barrier is not proposed under Build Alternative 2a.). At this location, I-80 is located within a Zone A floodplain. Due to the nature of Zone A, no BFEs have been established and the extents of flooding are approximate. A review was made of the FEMA Flood Insurance Study (FIS) for Yolo County to determine how the Zone A floodplain was developed in this area (Wood Rodgers 2022). The FIS states that:

> “Approximate analyses of ‘behind levee’ flooding were conducted for all the levees to indicate the extent of the behind levee floodplains. Along the Sacramento River, Sacramento River Toe Drain, and Yolo Bypass, the area shown on the most recent flood insurance rate map (FIRM) (prior to this current revision) as protected by the levees was assumed to be the area that would be inundated by the 1% annual chance flood if the levees were to fail.”



ESL
County Line

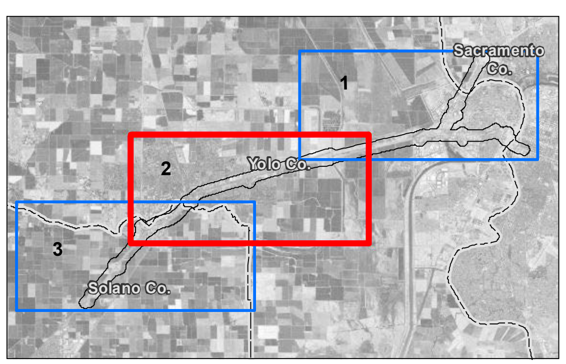
FEMA Flood Hazard
1% Annual Chance Flood Hazard
Area with Reduced Risk Due to Levee
Regulatory Floodway

0 1
Miles

Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2021
3. Background: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Figure 2.2-1
FEMA Flood Hazard
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\Figures\Fig_2.2-1_FEMAFlood.mxd Revised: 2021-10-21 By: pglendening



ESL
County Line

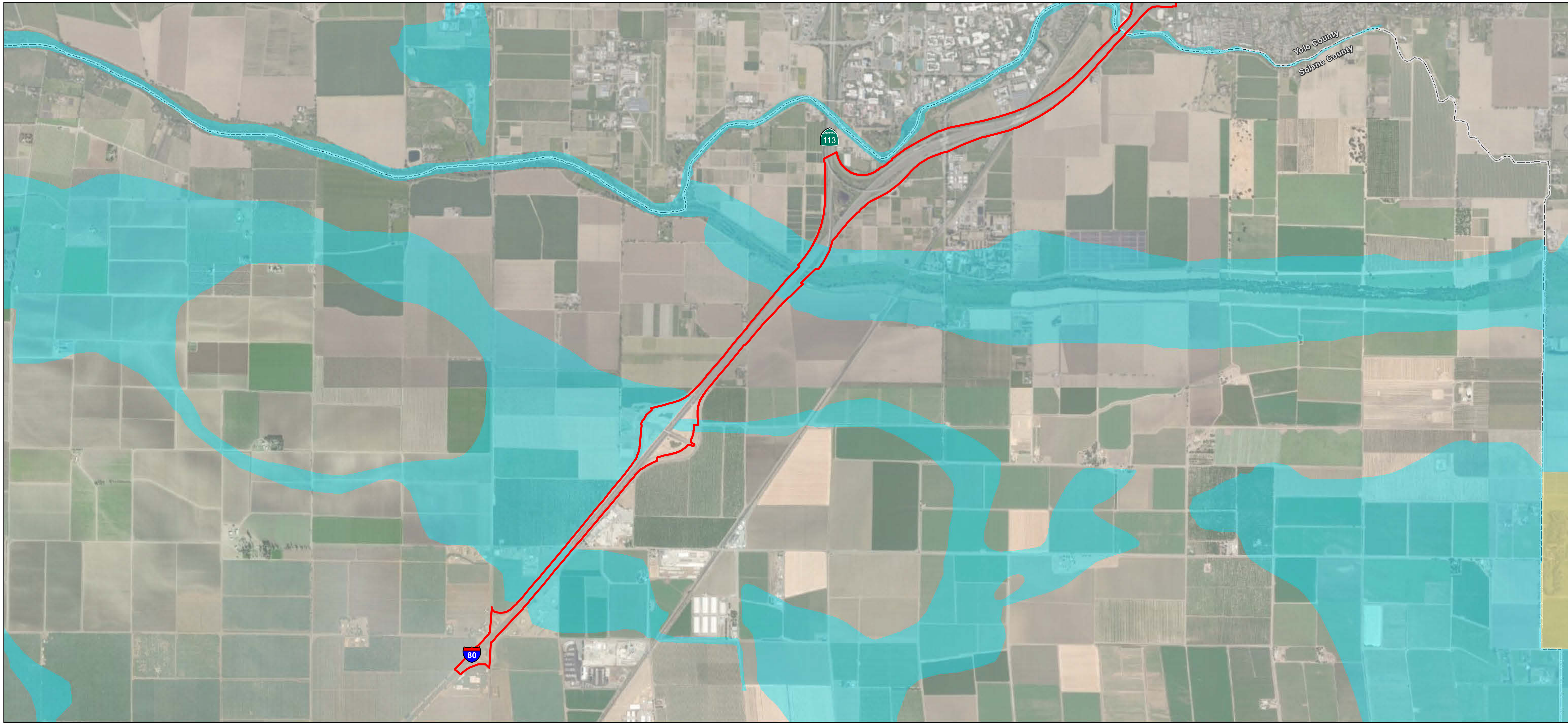
FEMA Flood Hazard
1% Annual Chance Flood Hazard
0.2% Annual Chance Flood Hazard

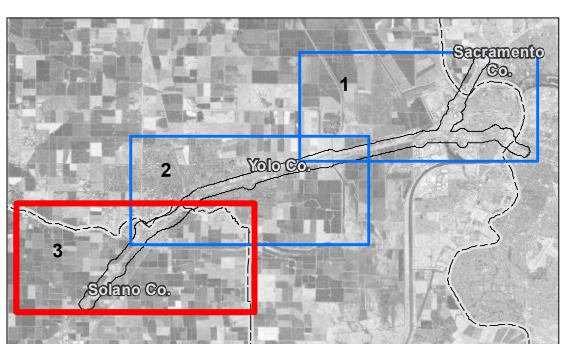
0 1
Miles

Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2021
3. Background: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\Figures\Fig_2.2-1_FEMAFlood.mxd Revised: 2021-10-21 By: pglendening

Figure 2.2-1
FEMA Flood Hazard
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California





ESL
County Line

FEMA Flood Hazard
1% Annual Chance Flood Hazard
Area of Undetermined Flood Hazard

0 1
Miles

Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2021
3. Background: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Caltrans

Figure 2.2-1
FEMA Flood Hazard
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\Figures\Fig_2.2-1_FEMAFlood.mxd Revised: 2021-10-21 By: pglendening

This location is behind the west levee of the Yolo Bypass, and the floodplain was determined using the above methodology. Flooding at this location is likely due to a failure of the Yolo Bypass, upstream and/or downstream of I-80. Therefore, to determine the depth of flooding on I-80 from PM 0.21 to PM 4.3, the published BFE in the Yolo Bypass adjacent to the project was used. An elevation of 29.5 feet (NAVD 88) was used to determine that this area of I-80 is completely submerged during the 100-year flood event and would continue to be so after the construction of the proposed concrete median under Build Alternative 2b. Thus, Build Alternative 2a or 2b would have no effect on the FEMA-mapped floodplain in this area. The project does not constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105.

Per the effective FEMA FIRM for Yolo County (effective date May 16, 2012), the 100-year BFE for the Yolo Bypass at I-80 is approximately at 29.5 feet elevation (NAVD 88). This was determined by interpolating BFEs located upstream and downstream of where I-80 crosses the Yolo Bypass. Although there is a potential for short-term adverse effects on riparian habitat during construction activities, no long-term effects on natural and beneficial floodplain values are anticipated as a result of Build Alternatives 2a and 2b. Build Alternatives 2a and 2b would not promote incompatible development within the floodplain; and with the implementation of AMM HF-1, these alternatives would not contribute to adverse effects on floodplains.

Build Alternatives 3a and 3b

Construction and Operation

Build Alternatives 3a and 3b would involve adding an HOT 2+ lane in each direction, and they propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 4a and 4b

Construction and Operation

Build Alternatives 4a and 4b would involve adding an HOT 3+ lane in each direction, and they propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 5a and 5b

Construction and Operation

Build Alternatives 5a and 5b would create an express lane in each direction where all users pay a fee regardless of vehicle occupancy, and they propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 6a and 6b

Construction and Operation

Build Alternatives 6a and 6b would involve adding a transit-only lane in each direction, and they propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 7a and 7b

Construction and Operation

Build Alternatives 7a and 7b would involve repurposing the current number 1 general purpose lane to HOV 2+. No new lanes would be constructed. Build Alternatives 7a and 7b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

2.2.1.4 Avoidance, Minimization, and/or Mitigation Measures

Caltrans will use the following avoidance and minimization measure to reduce impacts on the floodplain.

- **AMM HF-1 Detention Basin Risers (Build Alternatives 2a and 2b):** Increased peak flows will be moderated by the use of detention basin risers in existing infrastructure. Caltrans will install detention basin risers to tie into existing storm drains on the upstream side at two locations in the city of Davis—one detention basin rise inlet is proposed at the storm drain crossing on Mace Boulevard south of I-80 and the other will be at the WB I-80 off-ramp to Chiles Road.

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[2] 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:

[2] A point source is any discrete conveyance such as a pipe or a man-made ditch.

1. Sections 303 and 304 require states to issue water quality standards, criteria, and guidelines.

2. 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).

3. 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 (RWQCBs) administer this permitting program in California. Section 402(p) requires permits for discharges of storm water from industrial/construction and municipal separate storm sewer systems (MS4s).

4. Section 404 establishes a permit program for the discharge of dredge or fill material into waters of the U.S. This permit program is administered by the U.S. Army Corps of Engineers (USACE).

The goal of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."

The USACE issues two types of 404 permits: General and Individual. There are two types of General permits: Regional and Nationwide. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to allow a variety of minor project activities with no more than minimal effects.

Ordinarily, projects that do not meet the criteria for a Regional or Nationwide Permit may be permitted under one of the USACE's Individual permits. There are two types of Individual permits: Standard permits and Letters of Permission. For Individual permits, the USACE decision to approve is based on compliance with U.S. Environmental Protection Agency's (U.S. EPA) Section 404 (b)(1) Guidelines (40 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 the USACE, and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The Guidelines state that the USACE may not issue a permit if there is a least environmentally damaging practicable alternative (LEDPA) to the proposed discharge that would have lesser effects on waters of the U.S. and not have any other significant adverse environmental consequences. According to the Guidelines, documentation is needed that a sequence of avoidance, minimization, and compensation measures has been followed, in that order. The Guidelines also restrict permitting activities that violate water quality or toxic effluent[3] standards, jeopardize the continued existence of listed species, violate marine sanctuary protections, or cause "significant

---

[3] The U.S. EPA defines "effluent" as "wastewater, treated or untreated, that flows out of a treatment plant, sewer, or industrial outfall."

degradation" to waters of the U.S. In addition, every permit from the USACE, even if not subject to the Section 404(b)(1) Guidelines, must meet general requirements. See 33 CFR 320.4. A discussion of the LEDPA determination, if any, for the document is included in the Wetlands and Other Waters section.

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 SWRCB identifies waters failing to meet standards for specific pollutants. These waters are then state-listed in accordance with CWA Section 303(d). If a state determines that waters are impaired for one or more constituents and the standards cannot be met through point source or non-point source controls (NPDES permits or WDRs), the CWA requires the establishment of Total Maximum Daily Loads (TMDLs). TMDLs specify allowable pollutant loads from all sources (point, non-point, and natural) for a given watershed.

State Water Resources Control Board and Regional Water Quality Control Boards

The SWRCB administers water rights, sets water pollution control policy, and issues water board orders on matters of statewide application, and oversees water quality functions throughout the state by approving Basin Plans, TMDLs, and NPDES permits. 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

<u>**Municipal Separate Storm Sewer Systems (MS4)**</u>

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. The 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.

The 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:

1. Caltrans must comply with the requirements of the Construction General Permit (see below);
2. Caltrans must implement a year-round program in all parts of the State to effectively control storm water and non-storm water discharges; and
3. The 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 the Caltrans SWMP and Standard Specifications, a Water Pollution Control Program (WPCP) is necessary for projects with DSA less than one acre.

Section 401 Permitting

Under Section 401 of the CWA, any project requiring a federal license or permit that may result in a discharge to a water of the U.S. must obtain a 401 Certification, which certifies that the project will be in compliance with state water quality standards. The most common federal permits triggering 401 Certification are CWA Section 404 permits issued by the USACE. The 401 permit certifications are obtained from the appropriate RWQCB, dependent on the project location, and are required before the USACE issues a 404 permit.

In some cases, the RWQCB may have specific concerns with discharges associated with a project. As a result, the RWQCB may issue a set of requirements known as WDRs under the State Water Code (Porter-Cologne Act) that define activities, such as the inclusion of specific features, effluent limitations, monitoring, and plan submittals that are to be implemented for protecting or benefiting water quality. WDRs can be issued to address both permanent and temporary discharges of a project.

2.2.2.2 Affected Environment

Caltrans completed a Water Quality Assessment for the project (Caltrans 2021c). This section summarizes the findings of that review.

Regional and Local Hydrology

The project area is located within the Cache Slough Watershed in Solano County, and in the Knights Landing Ridge Cut-Tule Canal Watershed in Yolo and Sacramento counties. Table 2.2-1 summarizes hydrologic units within the project area.

Table 2.2-1. Hydrologic Units

Project Location (PM)	County	Hydrologic Unit	Hydrologic Sub-Area/Number	Latitude/Longitude	Hydrologic Area
40.7-42.392	Solano	Valley Putah-Cache Slough	Undefined/511.10	38.511, -121.7732	Elmira
42.932-5.813	Solano and Yolo	Valley Putah-Cache Slough	Undefined/511.20	38.5572, -121.6667	Lower Putah Creek
5.813-3.12	Yolo	Sacramento Delta	Undefined/510.00	38.5746, -121.5604	undefined
M0.0-M1.36	Sacramento	Valley-American	Pleasant Grove/519.22	38.6099, -121.5401	Coon-American
L0.0-L0.617	Sacramento	Valley-American	Franklin/519.11	38.569, -121.5111	Morrison Creek

Source: Caltrans 2021b

Erosion Potential

The project is not in an area where slopes are prone to erosion (Caltrans 2022).

Receiving Waters and TMDL Compliance

The only portion of the project that lies within a high-risk receiving watershed boundary is located in Sacramento County where the project crosses over the Sacramento River. High-risk receiving watersheds are watersheds that drain to water bodies that are either listed on the CWA 303(d) List for sedimentation/siltation or turbidity, have a USEPA-approved Total Maximum Daily Load Implementation Plan (TDML) for sediment; or have beneficial uses of Cold, Spawn, and Migratory.

The nearest major receiving waters that could potentially be impacted by project activities are Putah Creek, Willow Slough Bypass, Sacramento River, and Delta Waterways as summarized in Table 2.2-2. Under CWA Section 303(d), states, territories, and authorized tribes are required to develop a list of water quality limited segments that do not meet water quality standards. As discussed previously, the CWA requires the establishment of TMDLs, which specify allowable pollutant loads for a given watershed. Putah Creek, Willow Slough Bypass, and the Delta Waterways are listed on the CWA TMDLs and the USEPA’s 303(d) List of Water Quality Limited Segments.

Caltrans is a named stakeholder for the methymercury TMDL associated with the Delta Waterways further south of the project area and within specific designated priority reaches.

Table 2.2-2. Major Receiving Waterways

Waterway	County	Total Maximum Daily Loads
Putah Creek	Solano	Mercury
Northern Willow Slough	Yolo	Boron, bacteria, malathion, selenium, conductivity, toxicity, chlorpyrifos, and diuron
Sacramento River (Knights Landing to Delta)	Sacramento	Chlordane, chlorpyrifos, DDT, diazinon, dieldrin, conductivity, Group A Pesticides, invasive species, mercury, PCBs, and toxicity
Delta Waterways, northern portion	Sacramento	Chlordane, chlorpyrifos, DDT, diazinon, dieldrin, conductivity, Group A Pesticides, invasive species, mercury, PCBs, and toxicity

Source: Caltrans 2021b
PCBs = polychlorinated biphenyl; DDT = dichlorodiphenyltrichloroethane

Beneficial Uses

Beneficial uses define resources for aquatic systems and are the basis for water quality objectives. Designated uses are established by the State for each waterbody or water segment. Beneficial uses are critical to water quality management and the protection and enhancement of these beneficial uses are the primary goals of water quality planning. Using the Central Valley Regional Basin Plan and Caltrans' Water Quality Planning Tool, Table 2.2-3 identifies the following beneficial uses:

Table 2.2-3. Beneficial Uses

Hydrologic Sub-Area	Waterbody Name	Beneficial Uses
511.0	Yolo Bypass	AGR, COLD, MIGR, REC1, REC2, SPWN, WARM, WILD
511.20	Sacramento River (Colusa Basin Drain to I Street Bridge	AGR, COLD, MIGR, MUN, REC1, REC2, SPWN, WRM, WILD
510.0	Cosumnes River – Source to Delta	AGR, COLD, MIGR, MUN, REC1, REC2, SPWN, WARM, WILD
510.0	Sacramento San Joaquin Delta (8,9)	AGR, COLD, IND, MIGR, MUN, NAV, REC1, REC2, SPWN, WARM, WILD
510.0	Yolo Bypass	AGR, COLD, MIGR, REC1, REC2, SPWN, WARM, WILD

Source: Caltrans 2021b, California Water Board 2017
Key:
AGR = agricultural supply; COLD = cold freshwater habitat; IND = industrial service supply; MIGR = fish migration; MUN = municipal and domestic supply; NAV = navigation; PROC = industrial process supply; REC1 = water contact recreation; REC2 = noncontact water recreation; SPWN = fish spawning; WARM = warm freshwater habitat; WILD = wildlife habitat

Water Quality Objectives

All inland surface waters within the Sacramento River Basin have water quality objectives that are standard for the following constituents: bacteria, biostimulatory substances, chemical constituents, color, dissolved oxygen, floating material, mercury, methylmercury, oil and grease, pH, pesticides, radioactivity, salinity, sediment, settleable material, suspended material, tastes and odors, temperature, toxicity, and turbidity. The thresholds and limits for these can be found in the latest Central Valley Regional Basin Plan.

2.2.2.3 Environmental Consequences

No Build Alternative 1

Construction and Operation

Under No Build Alternative 1, managed lanes would not be added to the I-80 nor US-50 corridors and existing capacity would not increase and no ground-disturbing activities would occur. Vehicles traveling on I-80 and US-50 corridors would continue to generate pollutants from tire and brake wear, oil and grease leaks, and exhaust emissions. The release of these pollutants would be similar to existing conditions. Therefore, No Build Alternative 1would not have any new effects related to water quality and stormwater runoff.

Build Alternatives 2a and 2b

Construction

Build Alternatives 2a and 2b would involve adding an HOV2+ lane in each direction. Construction of Build Alternatives 2a and 2b would involve land-disturbing activities, use of construction equipment, clearing and grading, excavation, temporary staging of materials, etc. Ground disturbance would include proposed temporary and permanent impact areas such as staging areas, access roads, sign structures, and roadway widening. Discharge of storm water runoff from construction activities would potentially impact Putah Creek (Solano and Yolo counties), Willow Slough Bypass, Sacramento River, and Delta Waterways.

The discharge of storm water runoff from construction sites has the potential to affect water quality standards, water quality objectives, and beneficial uses. Potential pollutants and sources would include sediment; non-storm water (groundwater, waters from cofferdams, dewatering, water diversions) discharges from vehicle and equipment cleaning agents, fueling, and maintenance; and waste materials from storage activities.

A primary pollutant of concern is sediment and siltation from the disturbed construction areas. As such, Caltrans will implement a SWPPP, in accordance with Standard Measure WQ-1, which would include construction site BMPs during construction activities to avoid and reduce potential water quality effects. The SWPPP would include BMPs to protect sensitive areas and to prevent and minimize stormwater and non-stormwater discharges. Standard Measure WQ-1 requires Caltrans to follow all applicable guidelines and requirements in the 2018 Caltrans Standard Specifications, Section 13, regarding water pollution control and general specifications for preventing, controlling, and abating water pollution to Caltrans-owned storm sewers, streams, waterways, and other bodies of water.

In addition, Caltrans will comply with the NPDES Construction General Permit as part of Standard Measure WQ-2. Standard Measure WQ-3 requires coordination with the Caltrans District NPDES coordination during design to prepare a dewatering and discharge work plan.

If fueling or maintenance of construction vehicles occurs within the project area during construction, there is a risk of accidental spills or releases of fuels, oils, or other potentially toxic materials. An accidental release of materials may adversely affect water quality if contaminants enter storm drains, grassy swales, drainage ditches, or receiving water bodies. The magnitude of the effect from an accidental release depends on the amount and type of material spilled. Caltrans would implement Standard Measure WQ-1, which requires that any spills or leaks from construction equipment (i.e., fuel, oil, hydraulic fluid, and grease) would be cleaned up in accordance with applicable local, state, and/or federal regulations.

With implementation of Standard Measures, construction would not adversely affect water quality.

Operation

Once construction is completed, Build Alternatives 2a and 2b would include 22 acres and 25 acres, respectively, of new impervious surface. Build Alternative 2a would create approximately 16 acres of new impervious surface plus 3 acres of replaced impervious surface, totaling 19 acres of new impervious surface. Build Alternative 2b would create approximately 21 acres of new impervious surface plus 3 acres of replaced impervious surface, totaling 24 acres of new impervious surface. In accordance with the Caltrans MS4 permit, the Build Alternatives 2a and 2b would implement Standard Measure WQ-1 and incorporate post-construction water quality treatment BMPs and low-impact development controls to reduce non-point source pollutants as needed. Additionally, Standard Measure WQ-4 requires preparation of a Stormwater Data Report during the design phase, which would describe whether permanent treatment BMPs should be incorporated.

Operation of Build Alternatives 2a and 2b would have minimal effects on water quality.

Build Alternatives 3a and 3b

Construction and Operation

Build Alternatives 3a and 3b would involve adding an HOT 2+ lane in each direction. Because Build Alternatives 3a and 3b would be located in the same project area as Build Alternatives 2a and 2b and would involve similar ground-disturbing activities and the potential to release similar pollutants, the effects from construction and operation of Build Alternatives 3a and 3b would be the same as those described under Build Alternatives 2a and 2b, respectively.

Build Alternatives 4a and 4b

Construction and Operation

Build Alternatives 4a and 4b would involve adding an HOT 3+ lane in each direction. Because Build Alternatives 4a and 4b would be located in the same project area as Build Alternatives 2a and 2b and would involve similar ground-disturbing activities and the potential to release similar pollutants, the effects from construction and operation of Build Alternatives 4a and 4b would be the same as those described under Build Alternatives 2a and 2b, respectively.

Build Alternatives 5a and 5b

Construction and Operation

Build Alternatives 5a and 5b would create an express lane in each direction where all users pay a fee regardless of vehicle occupancy. Because Build Alternatives 5a and 5b would be located in the same project area as Build Alternatives 2a and 2b and would involve similar ground-disturbing activities and the potential to release similar pollutants, the effects from construction and operation of Build Alternatives 5a and 5b would be the same as those described under Build Alternatives 2a and 2b, respectively.

Build Alternatives 6a and 6b

Construction and Operation

Build Alternatives 6a and 6b would involve adding a transit-only lane in each direction. Because Build Alternatives 6a and 6b would be located in the same project area as Build Alternatives 2a and 2b and would involve similar ground-disturbing activities and the potential to release similar pollutants, the effects from construction and operation of Build Alternatives 6a and 6b would be the same as those described under Build Alternatives 2a and 2b, respectively.

Build Alternatives 7a and 7b

Construction and Operation

Build Alternatives 7a and 7b would involve repurposing the current number 1 general purpose lane to HOV 2+. Because Build Alternatives 7a and 7b would be located in the same project area as Build Alternatives 2a and 2b and would involve similar ground-disturbing activities and the potential to release similar pollutants, the effects from construction and operation of Build Alternatives 7a and 7b would be the same as those described under Build Alternatives 2a and 2b, respectively, with the exception of impervious surface. Build Alternative 7a would create approximately 6 acres of new impervious surface and 10 acres of net new impervious surface. Build Alternative 7b would create approximately 12 acres of new impervious surface and 16 acres of net new impervious surface.

2.2.2.4 Avoidance, Minimization, and/or Mitigation Measures

No AMMs or MMs would be required.

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 CEQA. This section discusses geology, soils, and seismic concerns as they relate to public safety and project design. Earthquakes are prime considerations in the design and retrofit of structures. Structures are designed using the 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

This section was prepared using the District Preliminary Geotechnical Reports that were prepared for the project (Caltrans 2021d, Caltrans 2021e, Caltrans 2021f). A subsurface investigation was performed in August 2020 of five rotary borings of varying depths from 90 feet to 210 feet. Another subsurface investigation was performed in April 2021 that consisted of 10 rotary borings of varying depths from 31.5 feet to 36.5 feet.

Geology

The project is located within the Sacramento Valley region of the Great Valley Geomorphic Providence. The Great Valley province is an asymmetrical synclinal trough that extends roughly 400 miles north to south and varies up to 50 miles in width separating the Sierra Nevada Mountains on the east from the Coast Range on the west. The surface of the Great Valley consists of up to several thousand feet of Quaternary aged, unconsolidated, marine and non-marine alluvial deposited sediments.

The materials that underlie the project area are mapped as Quaternary aged Alluvium deposits. From west to east, the project area is mapped as: Quaternary Alluvium (Q) between Kidwell road and the western side of the South Fork of Putah Creek; from the South Fork of Putah Creek to approximately Mace Blvd., the project area is mapped as Quaternary aged Levee and Channel Deposits (Qa); and from Mace Blvd. to the Sacramento River as Quaternary aged Basin Deposits (Qb); isolated alluvial deposits associated with the Modesto Riverbank Formation (Qmr) directly north and east of the Kidwell Rd and I-80 intersection; and alluvial deposits associated with the Modesto Formation (Qm), directly north and east of the Mace Blvd and I-80 intersection. Typically, materials associated with basin deposit consists of fine-grained sediments with horizontal stratification deposited by standing or slow-moving water in topography lows. (Caltrans 2021d).

Surface Conditions

The roadway elevation gradually decreases from west to the east, from an approximate maximum of 50 feet above sea level on the west end of the project to approximate low of 10 feet above sea level in the vicinity of the Sacramento River. Within the project area, local drainage generally trends northwest-southeast towards the Yolo Bypass and Sacramento River, which drains north-southwest.

Subsurface Conditions

The subsurface material below the existing roadway is composed of fill material that ranges in thickness from several feet to approximately 25 feet. The fill within the project limits is generally thicker in the areas of the bridge approaches. Below this fill material, the site is predominately composed of alluvial soils typically consisting of mixed layers of clay, silt, sand, and gravels in varying thickness.

Groundwater

The depth of groundwater varies throughout the project area due to variations in ground surface elevations and groundwater conditions. Based on groundwater depths and elevations, depth of groundwater decreases from west to east along the project route. Measured groundwater during the April 2021 and August 2020 subsurface investigation and review of the existing log of test borings (LOTBs) show that the groundwater depth is shallow in the majority of the project area, except the west section where groundwater was measured to be deeper than 25 feet.

Seismic Hazards

There are two main faults located in Yolo County: the Hunting Creek Fault and the Dunnigan Hills Fault (Yolo County 2009). There are three fault zones located in Sacramento County: Cleveland Hills, Sierra Nevada, and San Joaquin Fault.

The only fault in Yolo County that has been identified to be active, or potentially active, and subject to surface rupture is the Hunting Creek Fault (sometimes referred to as the Hunting Creek-Berryessa Fault). The fault is located about 40 miles northwest of the project area. Other major regional faults outside Yolo County in the Coast Ranges and in the Sierra Nevada foothills are capable of producing ground shaking in the county (Yolo County 2009). Additionally, the Coast Range-Sierran Block Boundary, located at the edge of the western side of the lower Sacramento Valley, is recognized as a potential seismic source capable of generating moderate earthquakes that could affect Yolo County (Yolo County 2009).

Fault Rupture

The potential for surface fault rupture within the project area is low since there are no known faults of Holocene or younger age that fall within 1,000 feet of the project limits, or trend towards the project limits, nor do the project limits fall within an Alquist-Priolo Fault Zone.

Liquefaction

Loose, saturated soils pose the greatest threat during episodes of strong ground shaking. Possible hazards that could result from strong ground shaking include unstable soils, liquefaction, and landslides. Liquefaction is a phenomenon in which soils lose all shear strength and essentially turn into liquids. Within the project area, the subsurface soil profile consists of clayey or fill material at the overlaying native interbedded layers of medium dense to dense silts and sands. There are also isolated thin layers of saturated loose granular soils present in the project area. These conditions may lead to the potential for liquefaction.

Mineral Resources

The project area does not contain any known mineral resource zones but does traverse several gas fields near the Davis and West Sacramento (Yolo County 2009, Sacramento County 2011).

2.2.3.3 Environmental Consequences

No Build Alternative 1

Construction and Operation

Under No Build Alternative 1, managed lanes would not be added to the I-80 or US-50 corridors and existing capacity would not increase. No ground-disturbing activities would occur and there would be no roadway improvements. Because on-site soils would not be disturbed, no impact related to significant disruptions, displacements, compaction or overcrowding of on-site soils, and/or substantial change in topography or ground surface relief features would occur. Therefore, No Build Alternative 1 would not have any effects related to geology and soils.

Build Alternatives 2a and 2b

Construction

Build Alternatives 2a and 2b would involve adding an HOV2+ lane in each direction. Construction of Build Alternatives 2a and 2b would involve land-disturbing activities such as clearing and grading, excavation, and temporary staging or stockpiling of materials. Build Alternatives 2a and 2b could result in disruptions, displacements, compaction, or overcrowding of on-site soils, and changes in topography or ground surface features that could result in wind or water erosion of onsite or offsite soils.

During construction, Caltrans would implement Standard Measure GS-1 which would include BMPs designed to minimize slope failure, settlement, and erosion. In addition, Caltrans would implement a SWPPP, in accordance with Standard Measure WQ-1, which would include implementation of construction site BMPs to avoid and reduce potential effects related to erosion, siltation, runoff, and discharge of pollutants. The SWPPP would include BMPs to protect sensitive areas. With implementation of Standard Measures GS-1 and WQ-1, potential construction and operation effects on erosion, siltation, and runoff would be minimal.

New embankment fill would be required for the bike pathway extension from I-80 along the Yolo Causeway to connect to CR-32A for Build Alternatives 2a and 2b. The Build Alternative 2b connector structure would include a retaining wall on either side and would travel underneath the existing eastbound connector from US-50 to I-80. Accordingly, the connector structure would require new embankment fill. The underlining clay layer which extends up to 16 to 20 feet below the original ground ranges in consistency from medium stiff to very stiff and is less susceptible to consolidation settlements. However, the proposed large embankment fill consolidation settlement could be considerable. All earthwork on the connector structure would be done in conformance with Section 19 of the 2018 Standard Specifications and would follow the recommendations associated with construction settlement in the geotechnical analyses

(AMM GEO-3). Therefore, the construction of Build Alternative 2b would not have an adverse effect on the slope stability of the proposed embankment.

Build Alternatives 2a and 2b would construct five new culverts and replace or improve 21 existing culverts located beneath the roadway, fill, and embankments at depths unlikely to encounter groundwater. Overhead sign structures would have a concrete foundation of up to 6.5 feet diameter and would either be supported on a cast-in-drilled-hole pile foundation or supported by a structure that could be approximately 30 feet in depth. Build Alternatives 2a and 2b would install a fiber-optic cable and associated fiber-optic splice boxes within the roadbed at the eastbound outside shoulder of I-80 from west of Kidwell Road at PM 40.7 in Solano County to PM 4.35 in Yolo County. Cut and cover or trenching would be the primary construction method and would require excavation of up to 42 inches to install within a 12-foot buffer surrounding the running line. In addition, Build Alternative 2b proposes pile driving during construction for installation of footings of the connector structure to a depth of approximately 40 feet. Groundwater is anticipated to be encountered in excavations as shallow as 1 to 2 feet below ground surface within the Yolo Bypass, and 5 feet below ground surface east of the Yolo Bypass. Groundwater is anticipated to be deeper than 25 feet in the western section of the project. However, groundwater conditions can be expected to fluctuate in response to seasons, storm events, and other factors. Dewatering may be required if encountered during construction of the connector structure. AMM GEO-1 states that during construction, all trenching and earthwork will be performed in accordance with Section 19 of the 2018 Standard Specifications.

According to the Yolo County General Plan EIR, liquefaction is expected to be relatively higher in the Great Valley portion of the county, particularly along the floodplains of streams, where the sediments are generally sandier than other areas (Yolo County 2009). In addition, project-specific geotechnical investigations and review of the LOTBs show that the subsurface profile throughout the project limits consists of clayey or fill material at the overlaying native interbedded layers of medium dense to dense silts and sands with isolated thin layers of saturated loose granular soils.

There is low potential for seismic activity to occur during construction due to the distance from active faults. Seismic shaking creates opportunities for liquefaction. Construction workers could be exposed to seismic hazards during installation of the proposed improvements due to the potential for seismic activity, causing a potentially adverse impact on construction workers' safety. AMM GEO-2 would be implemented to reduce the potential for adverse impacts resulting from seismic activity during construction.

Operation

During project operation, the project area could be affected by ground motion, liquefaction, and possible ground rupture from seismic activity. Without proper engineering, improvements could pose safety issues to people and structures as a result of soil erosion, subsidence, expansive soils, corrosive soils, surface fault rupture, seismic shaking, liquefaction, and landslides. AMM GEO-3 requires that, prior to final design, additional subsurface testing will be conducted so that any new or modified structure will be designed and constructed to current building and seismic standards and includes consideration of liquefaction potential in the design of foundation and retaining systems. Build Alternatives 2a and 2b would be designed and constructed in accordance with the latest Caltrans design guidelines based on the site-specific field investigations required for the preliminary foundation report during the development of the Final Design (Plans, Specifications, and Estimates). Therefore, operation of the project is not expected to result in substantial effects on resources related to seismicity within the project area.

Build Alternatives 3a and 3b

Construction and Operation

Build Alternatives 3a and 3b would involve adding an HOT 2+ lane in each direction. Build Alternatives 3a and 3b would be located in the same project area and involve similar ground-disturbing activities as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 4a and 4b

Construction and Operation

Build Alternatives 4a and 4b would involve adding an HOT 3+ lane in each direction. Build Alternatives 4a and 4b would be located in the same project area and involve similar ground-disturbing activities as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 5a and 5b

Construction and Operation

Build Alternatives 5a and 5b would create an express lane in each direction where all users pay a fee regardless of vehicle occupancy. Build Alternatives 5a and 5b would be located in the same project area and involve similar ground-disturbing activities as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 6a and 6b

Construction and Operation

Build Alternatives 6a and 6b would involve adding a transit-only lane in each direction. Build Alternatives 6a and 6b would be located in the same project area and involve similar ground-disturbing activities as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 7a and 7b

Construction and Operation

Build Alternatives 7a and 7b would involve repurposing the current number 1 general purpose lane to HOV 2+. No new lanes would be constructed. Build Alternatives 7a and 7b would be located in the same project area and involve similar ground-disturbing activities as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

2.2.3.4 Avoidance, Minimization, and/or Mitigation Measures

Caltrans would implement the following AMMs to prevent and reduce permanent effects on geology and soils.

- **AMM GEO-1 Earthwork.** During construction, all trenching and earthwork shall be performed in accordance with Section 19 of the 2018 Standard Specifications.

- **AMM GEO-2:** With respect to worker safety during construction, Caltrans' Standard Specifications and California Division of Occupational Safety and Health Administration (Cal OSHA) requires employers to comply with hazard-specific safety and health standards. Pursuant to Section 5(a) (1) of Cal OSHA, employers must provide their employees with a workplace free from recognized hazards likely to cause death or serious physical harm.

- **AMM GEO-3:** As part of the final design phase, Caltrans requires preparation of the geotechnical design reports that incorporate the results of additional subsurface fieldwork and laboratory testing. Site-specific subsurface soil conditions, slope stabilities, and groundwater conditions within the Build Alternative area would be verified during the preparation of these geotechnical design reports. The identification of the site-specific soil conditions within the project limits would be used to determine the appropriate final design for the foundations and footings that would support the proposed Build Alternative improvements. Caltrans' standard design and construction guidelines incorporate engineering standards that address seismic risks. Proposed structures constructed within the project area would consider seismically induced liquefaction and settlement during the final design phase.

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) 431-433 (the "Antiquities Act") prohibits appropriating, excavating, injuring, or destroying any object of antiquity situated on federal land without the permission of the Secretary of the Department of Government having jurisdiction over the land. Fossils are considered "objects of antiquity" by the Bureau of Land Management, the National Park Service, the Forest Service, and other federal agencies.

- 23 United States Code (USC) 1.9(a) requires that the use of Federal-aid funds must be in conformity with all federal and state laws.
- 23 United States Code (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).

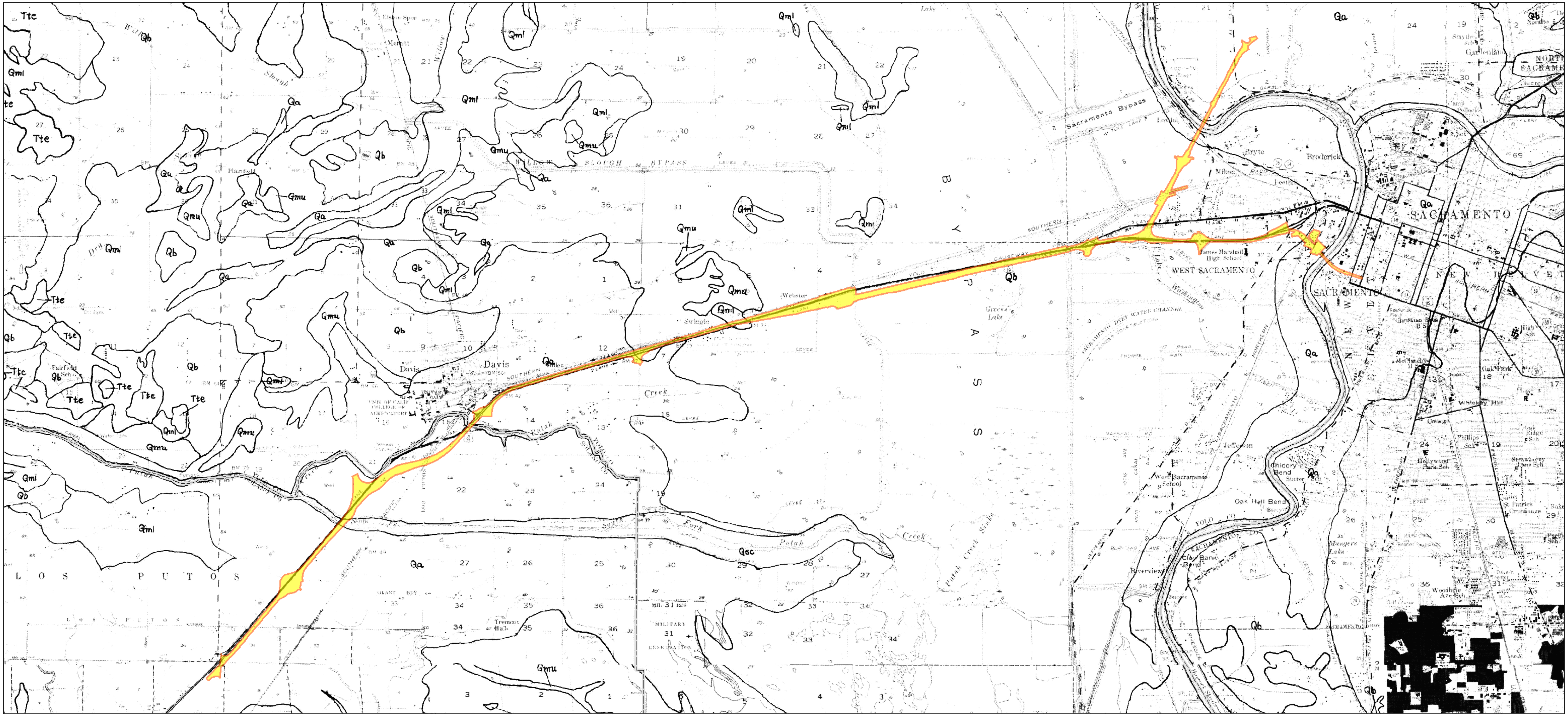
2.2.4.2 Affected Environment

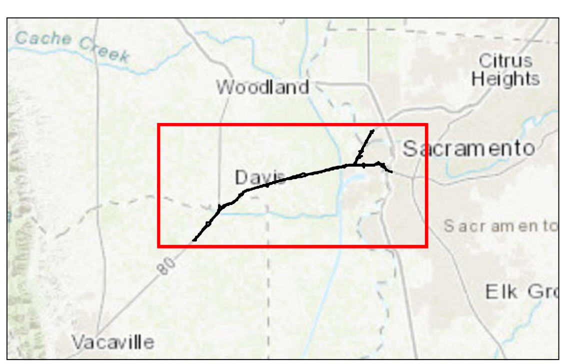
A Paleontological Identification Report (PIR) was prepared for this report in March 2021 (Caltrans 2021g) and was updated and adapted to the new paleontological template in August 2023. This section is based on the findings of the PIR. The project site is located within the Sacramento Valley region of the Great Valley geomorphic province in California. The Great Valley province is an asymmetrical synclinal trough that extends roughly 400 miles north to south and up to 50 miles in width separating the Sierra Nevada Mountains on the east from the Coast Range on the west. The surface of the Great Valley consists of up to several thousand feet of unconsolidated marine and non-marine sediments.

The project site is generally on flat agricultural and delta terrain. It crosses Putah Creek near its western end and the Sacramento River in two places near its eastern end. The American River meets the Sacramento River between the project forks. Underlying the project are gravel-filled channels laid down during the Pleistocene time by ancestors of the Sacramento River, the American River, and smaller tributaries such as Putah Creek (Figure 2.2-2).

The paleontological potential of the geologic units underlying and near the Project corridor was evaluated. These units include artificial fill (Af), stream channel deposits (Qsc), Holocene alluvial deposits (Qa), Holocene basin deposits (Qb), Modesto Formation (Qmu/Qml), and Riverbank Formation (Qrl) (Figure 2.2-2). The Modesto Formation (Qmu/Qml) and Riverbank Formation (Qrl) date to the late Pleistocene and have the potential to contain scientifically significant vertebrate fossils. Most of the project crosses sediment that is Holocene alluvial deposits (Qa) or Holocene basin deposits (Qb) however the Modesto and Riverbank Formations could be encountered at depth.

Searches of the UC Berkeley Museum of Paleontology and the PaleoBiology databases were performed in January and February 2021 and updated in 2023 as was a literature review. Records of seven vertebrate fossil localities were found within four miles of the project in sediment similar to that of the project site.





ESL

Geological Units in the ESL
Qa: Quaternary Alluvium
Qb: Basin Deposits
Qsc: Stream Channel Deposits
Qml: Modesto Formation

0 2
Miles

Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2021
3. Background: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\Figures\Fig_2.2-2_GeologicUnits.mxd Revised: 2021-10-21 By: pglendening

Figure 2.2-2
Geologic Units
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

2.2.4.3 Environmental Consequences

Caltrans uses a tripartite system to rank the risk of encountering significant fossil resources: no, low, and high risk. If significant fossil resources have been previously discovered within a geologic unit (formation), then that formation in its entirety is considered High risk.

No Build Alternative 1

Construction and Operation

Under No Build Alternative 1, managed lanes would not be added to the I-80 or US-50 corridors and existing capacity would not increase. No ground-disturbing activities would occur. Therefore, No Build Alternative 1 would not have any effects related to paleontological resources.

Build Alternatives 2a and 2b

Construction

Build Alternatives 2a and 2b would involve adding an HOV2+ lane in each direction. Build Alternatives 2a and 2b would require soil disturbance, including installation of signage, road cutting or filling, extending or replacing culverts, utility relocation, and fiber optic line installation. In addition, Build Alternatives 2a and 2b would include excavation for roadbed, and retaining and sound wall installation. Build Alternatives 2a and 2b would install poles for lighting, signs, and Intelligent Transportation Systems (ITS). Foundations for these structures would generally be installed using an auger to drill a hole up to 6.5 feet in diameter and up to 30 feet deep, and a cast-in-drilled-hole concrete foundation would be constructed.

Build Alternative 2b proposes pile driving during construction for installation of footings of the connector structure to a depth of approximately 40 feet. Such activities would be deep enough to reach potentially unknown sensitive paleontological resources. In addition, foundation work for signs, structures, underground utilities, and culvert/drainage installations could also encounter sensitive paleontological resources.

Due to the low sensitivity of the surficial geology directly underneath the project limits, construction activities with shallow disturbances (up to 4 feet) are unlikely to encounter significant fossil resources. In addition, many proposed construction activities would occur within existing disturbed areas of the roadway corridors. Due to the proximity of the project to known high-sensitivity geologic units, excavations greater than 4 feet below the ground surface have an increased potential to encounter sensitive formations and significant fossil resources. Build Alternatives 2a and 2b would require excavations greater than 4 feet for installation of signs, CMS structures, and retaining walls.

Standard Measure GS-2 outlines actions to be taken in the event of a paleontological discovery during construction. If unanticipated paleontological resources are discovered during construction, they would not be disturbed. Work within a 60-foot radius of the discovery would stop; the area would be secured; and the work would not resume until appropriate measures are taken. In addition, AMM PALEO-1 would require preparation of a Paleontological Evaluation

Report (PER) during the design phase to verify if project activities have the potential to impact paleontological resources. Depending on the findings of the PER, AMM PALEO-2 will be implemented, which requires the preparation and execution of a Paleontological Mitigation Plan (PMP) during project construction in areas of high sensitivity. In addition, AMM PALEO-3 would require paleontological construction monitoring in areas with high paleontological sensitivity. With implementation of Standard Measure GS-2 and AMMs PALEO-1 through PALEO-3, Alternatives 2a and 2b would not have substantial adverse effects on paleontological resources.

Operation

No ground disturbance would occur during operation of Build Alternatives 2a and 2b. Therefore, there would be no effects on paleontological resources during operation.

Build Alternatives 3a and 3b

Construction and Operation

Build Alternatives 3a and 3b would involve adding an HOT 2+ lane in each direction. Because Build Alternatives 3a and 3b would be located in the same project area as Build Alternatives 2a and 2b, respectively, and would involve similar ground-disturbing activities, the effects from construction and operation of Build Alternatives 3a and 3b would be the same as those described under Build Alternatives 2a and 2b, respectively.

Build Alternatives 4a and 4b

Construction and Operation

Build Alternatives 4a and 4b would involve adding an HOT 3+ lane in each direction. Build Alternatives 4a and 4b would be located in the same project area and involve similar ground-disturbing activities as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 5a and 5b

Construction and Operation

Build Alternatives 5a and 5b would create an express lane in each direction where all users pay a fee regardless of vehicle occupancy. Build Alternatives 5a and 5b would be located in the same project area and involve similar ground-disturbing activities as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 6a and 6b

Construction and Operation

Build Alternatives 6a and 6b would involve adding a transit-only lane in each direction. Build Alternatives 6a and 6b would be located in the same project area and involve similar ground-disturbing activities as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 7a and 7b

Construction and Operation

Build Alternatives 7a and 7b would involve repurposing the current number 1 general purpose lane to HOV 2+. No new lanes would be constructed. Build Alternatives 7a and 7b would be located in the same project area and involve similar ground-disturbing activities as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

2.2.4.4 Avoidance, Minimization, and/or Mitigation Measures

Caltrans would implement the following AMMs to reduce potential effects on paleontological resources.

- **AMM PALEO-1: Paleontological Evaluation Report**. During the design phase, a qualified paleontologist will prepare a PER. If the PER results in an evaluation that the project does not risk encountering paleontological resources, no further measures are required.

- **AMM PALEO-2: Paleontological Resources Management Plan.** During the design phase, a qualified paleontologist will prepare a PMP. If the PER results in an evaluation that the project does not risk encountering paleontological resources, a PMP would not be required. The PMP would incorporate the results of the PER along with design details to develop a plan for where and when construction activities are at risk of encountering fossils and construction monitoring will occur. The PMP will also include procedures for worker training and actions for construction staff to follow if fossils are encountered. It will also include a curation agreement for the housing and identification of any fossils found.

- **AMM PALEO-3: Paleontological Resources Monitoring.** During construction, areas of high paleontological sensitivity would be monitored by a qualified paleontological monitor. The monitor would spot-check locations where foundation, utility, and/or culvert work extends deeper than 4 feet below ground surface into native soils (not fill material).

2.2.5 Hazardous Waste and 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 (RCRA) 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

An Initial Site Assessment (ISA) was completed for this project in February 2021 (Caltrans 2021h). The ISA included investigations pertaining to naturally occurring asbestos (NOA), hazardous waste sites (Cortese List), aerially deposited lead (ADL), lead-containing paint (LCP) and thermoplastic striping, and treated wood waste (TWW).

A geologic evaluation regarding NOA was conducted within the project limits. This evaluation included a review of geologic maps and reports including data prepared by the California Geological Survey (CGS) and the United States Geological Survey (USGS), and previous studies conducted by Caltrans and their consultants. The evaluation did not indicate the presence of altered ultramafic bedrock, alluvium derived from ultramafic rock, or rock commonly associated with NOA.

ADL also exists along roadways throughout California from the historical use of leaded gasoline. ADL from motor-vehicle exhaust may be present in the soils adjacent to project area roads based on the age of the roadway and the date of the ban (1996) of leaded motor vehicle fuel.

LCP and asbestos containing materials (ACM) have the potential to be present within the project area. Bridges and overpass structures may be coated with LCP and/or ACM in paints, gaskets, caulking, insulation, and tarred surfaces. The likelihood of asbestos being present increases with the age of the bridge, since the use of asbestos-containing building materials began to diminish in the 1980s. Similarly, lead-based paint was commonly used to coat bridge components such as railings and other metal and wood surfaces prior to its being banned in California in 1978. Lead and asbestos are state-recognized carcinogens, and lead is a reproductive toxin.

TWW has the potential to be encountered in the form of posts along metal beam guard railing three-beam barrier, piles, or roadside signs. These wood products are typically treated with preserving chemicals that may be hazardous (e.g., carcinogenic) and could include arsenic, chromium, copper, creosote, or pentachlorophenol. Based upon visual survey of the proposed disposal area by Google Earth Street-View Imagery, TWW may be present within the area (Caltrans 2021h).

The Cortese List is a compilation of contaminated sites identified by the SWRCB; active, closed, and inactive landfills identified by the Integrated Waste Management Board; and potential hazardous waste sites identified by the Department of Toxic Substance Control. This list was reviewed as part of the initial screening for this project. Both the Envirostor and the Geotracker database did not show that the project area contains any hazardous waste/sources.

2.2.5.3 Environmental Consequences

No Build Alternative 1

Construction and Operation

Under No Build Alternative 1, managed lanes would not be added to the I-80 or US-50 corridors and existing capacity would not increase. No ground-disturbing activities would occur. Therefore, No Build Alternative 1 would not have any effects related to hazardous waste and materials.

Construction

Build Alternatives 2a and 2b

Build Alternatives 2a and 2b would involve adding an HOV2+ lane in each direction. Results of the ISA did not indicate the presence of NOA within the footprint of Build Alternatives 2a or 2b; therefore, Build Alternatives 2a or 2b would not have the potential to expose workers or nearby residents to NOA. In addition, Build Alternatives 2a and 2b are not within a Cortese List site boundary and would not impact any site on the Cortese List. Therefore, Build Alternatives 2a and 2b would not affect known hazardous sites.

ACM and LCP have the potential to be encountered during project construction and ground-disturbing activities including grinding/cold planing.

An ACM and LCP survey by a qualified and licensed inspector prior to construction is required for any structure proposed to be demolished or disturbed, including but not limited to, the following structures (AMM HAZ-1):

- Bridge #22-0077 - Richards Blvd OC
- Bridge #22-0043 - Webster UC
- Bridge #22-0044 - Yolo Causeway West
- Bridge #22-0045 - Yolo Causeway East
- Bridge #22-0100 - Enterprise Blvd UC

Standard Measure HW-1 would require Caltrans to prepare a Lead Compliance Plan that would include protocols for environmental and personnel monitoring, requirements for personal protective equipment, and other procedures for handling of lead-impacted soil. In addition, AMM HAZ-2 would require Caltrans to prepare an Asbestos Compliance Plan to outline the procedures to report, handle, store, and dispose of ACM. All ACM or LCP, if found, would be removed by a certified contractor in accordance with local, state, and federal requirements (Standard Measure HW-2 and AMM HAZ-2).

In addition, prior to construction, a demolition notification form and attachments would be prepared by the contractor and submitted to the air district, as required by the National Emission Standards for Hazardous Air Pollutants (AMM HAZ-2).

ADL exists along roadways throughout California due to the historical use of leaded gasoline. 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 area. Soil determined to contain lead concentrations exceeding stipulated thresholds must be managed under the July 1, 2016, ADL Agreement between Caltrans and the California Department of Toxic Substances Control. This ADL Agreement allows such soils to be safely reused within the project area as long as all requirements of the ADL Agreement are met.

Prior to construction, Caltrans would conduct a PSI for ADL. Based on results of the PSI, special materials handling, worker health and safety training, or regulated soil disposal may be required for construction (AMM HAZ-3).

Construction would involve the use and storage of fuels, lubricants, solvents, and other possible contaminants. In the event hazardous materials are encountered or spilled during construction, Caltrans would implement actions outlined in AMM HAZ-4, Hazardous Materials Incident Contingency Plan, to report, contain, and mitigate roadway spills. The plan will designate a chain of command for notification, evacuation, response, and cleanup of roadway spills.

Based on visual survey of the project area, TWW has the potential to be encountered during construction in the form of posts along metal beam guard railing three-beam barrier, piles, or roadside signs. The Department of Toxic Substance Control requires that TWW either be disposed as a hazardous waste or tested. If not tested, the generator may presume that TWW is a hazardous waste and must be disposed in an approved TWW facility. If TWW is present, Caltrans will implement Standard Measure HW-3, which outlines specifications for worker training and TWW handling, storage, and disposal requirements.

Standard Measures HW-1, HW-2, HW-3 and AMMs HAZ-1, HAZ-2, HAZ-3, and HAZ-4 would minimize potential effects related to hazards during construction; and no adverse effect would occur.

Operation

Operation of Build Alternatives 2a and 2b would not release hazardous materials; however, vehicles traveling on I-80 or US-50 roadway corridors would continue to generate pollutants from tire and brake wear, oil and grease leaks, and exhaust emissions. The release of these pollutants would be similar to existing conditions; therefore, Build Alternatives 2a and 2b would not result in new adverse effects.

Build Alternatives 3a and 3b

Construction and Operation

Build Alternatives 3a and 3b would involve adding an HOT 2+ lane in each direction. Because Build Alternatives 3a and 3b would be located in the same project area as Build Alternatives 2a and 2b, would involve the use of the same hazardous materials, and/or would encounter the same hazardous waste during construction, the effects from construction and operation of Build Alternatives 3a and 3b would be the same as those described under Build Alternatives 2a and 2b.

Build Alternatives 4a and 4b

Construction and Operation

Build Alternatives 4a and 4b would involve adding an HOT 3+ lane in each direction. Because Build Alternatives 4a and 4b would be located in the same project area as Build Alternatives 2a and 2b, would involve the use of the same hazardous materials, and/or would encounter the same hazardous waste during construction, the effects from construction and operation of Build Alternatives 4a and 4b would be the same as those described under Build Alternatives 2a and 2b.

Build Alternatives 5a and 5b

Construction and Operation

Build Alternatives 5a and 5b would create an express lane in each direction where all users pay a fee regardless of vehicle occupancy. Because Build Alternatives 5a and 5b would be located in the same project area as Build Alternatives 2a and 2b, would involve the use of the same hazardous materials, and/or would encounter the same hazardous waste during construction, the effects from construction and operation of Build Alternatives 5a and 5b would be the same as those described under Build Alternatives 2a and 2b.

Build Alternatives 6a and 6b

Construction and Operation

Build Alternatives 6a and 6b would involve adding a transit-only lane in each direction. Because Build Alternatives 6a and 6b would be located in the same project area as Build Alternatives 2a and 2b, would involve the use of the same hazardous materials, and/or would encounter the same hazardous waste during construction, the effects from construction and operation of Build Alternatives 6a and 6b would be the same as those described under Build Alternatives 2a and 2b.

Build Alternatives 7a and 7b

Construction and Operation

Build Alternatives 7a and 7b would involve repurposing the current number 1 general purpose lane to HOV 2+. Because Build Alternatives 7a and 7b would be located in the same project area as Build Alternatives 2a and 2b, would involve the use of the same hazardous materials, and/or would encounter the same hazardous waste during construction, the effects from construction and operation of Build Alternatives 7a and 7b would be the same as those described under Build Alternatives 2a and 2b.

2.2.5.4 Avoidance, Minimization, and/or Mitigation Measures

Caltrans would implement the following AMMs to reduce potential effects caused by hazardous waste and materials.

- **AMM HAZ-1 Asbestos and Lead-Based Paint Survey.** During the design phase, existing bridge or structures that would be disturbed by the project would be tested for asbestos and lead-based paint by a qualified and licensed inspector prior to construction. All asbestos-containing material or lead-based paint, if found, would be removed by a certified contractor in accordance with local, state, and federal requirements.

- **AMM HAZ-2 National Emission Standards for Hazardous Air Pollutants Notification.** Prior to construction, the contractor will prepare a demolition/renovation/rehabilitation notification/permit form and attachments to be submitted to the Air Pollution Control District (APCD) or Air Quality Management District (AQMD) as required by the National Emission Standards for Hazardous Air Pollutants (NESHAP) at 40 CFR Part 61, Subpart M, and California Health and Safety Code section 39658(b)(1).

- **AMM HAZ-3 Aerially Deposited Lead Preliminary Site Investigation.** Prior to construction, Caltrans would conduct a preliminary site investigation for aerially deposited lead. Soil samples collected to evaluate aerially deposited lead would be analyzed for total lead and soluble lead in accordance with Department of Toxic Substances Control's requirements to determine appropriate actions that would ensure the protection of construction workers, future site users, and the environment.

- **AMM HAZ-4 Hazardous Materials Incident Contingency Plan**. Prior to construction, the contractor will prepare a hazardous materials incident contingency plan to report, contain, and mitigate roadway spills. The plan would designate a chain of command for notification, evacuation, response, and cleanup of roadway spills. This plan is to be prepared by the contractor.

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 is its companion state law. These laws, and related regulations by the United States Environmental Protection Agency (USEPA) 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: CO, nitrogen dioxide (NO_2), 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 (H2S), and vinyl chloride. The NAAQS and state standards are set at levels that protect public health with a margin of safety and are subject to periodic review and revision. Both state and federal regulatory schemes also cover toxic air contaminants (air toxics); some criteria pollutants are also air toxics or may include certain air toxics in their general definition.

Federal air quality standards and regulations provide the basic scheme for project-level air quality analysis under the NEPA. In addition to this environmental analysis, a parallel "Conformity" requirement under the FCAA also applies.

Conformity

The conformity requirement is based on FCAA Section 176(c), which prohibits the USDOT and other federal agencies from funding, authorizing, or approving plans, programs, or projects that do not conform to State Implementation Plan (SIP) for attaining the NAAQS. "Transportation Conformity" applies to highway and transit projects and takes place on two levels: the regional (or planning and programming) level and the project level. The proposed project must conform at both levels to be approved.

Conformity requirements apply only in nonattainment and "maintenance" (former nonattainment) areas for the NAAQS, and only for the specific NAAQS that are or were violated. USEPA regulations at 40 CFR 93 govern the conformity process. Conformity requirements do not apply in unclassifiable/attainment areas for NAAQS and do not apply at all for state standards regardless of the status of the area.

Regional conformity is concerned with how well the regional transportation system supports plans for attaining the NAAQS for CO, NO_2, O, particulate matter (PM_{10} and $PM_{2.5}$), and in some areas (although not in California), 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 RTPs and federal transportation improvement programs (FTIPs) that include all transportation projects planned for a region over a period of at least 20 years (for the RTP) and 4 years (for the FTIP). RTP and FTIP conformity uses travel demand and emission models to determine whether or not the implementation of those projects would conform to emission budgets or other tests at various analysis years showing that requirements of the FCAA and the SIP are met. If the conformity analysis is successful, the Metropolitan Planning Organization (MPO), FHWA, and Federal Transit Administration (FTA) make the determinations that the RTP and FTIP are in conformity with the SIP for achieving the goals of the FCAA. Otherwise, the projects in the RTP and/or FTIP must be modified until conformity is attained. If the design concept and scope and the “open-to-traffic” schedule of a proposed transportation project are the same as described in the RTP and FTIP, then the proposed project meets regional conformity requirements for purposes of project-level analysis.

Project-level conformity is achieved by demonstrating that the project comes from a conforming RTP and TIP; the project has a design concept and scope that has not changed significantly from those in the RTP and TIP; project analyses have used the latest planning assumptions and USEPA-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 effects.

Local

The US Environmental Protection Agency (USEPA) has delegated responsibility to air districts to establish local rules to protect air quality. Caltrans Standard Specification 14-9.02requires compliance with all applicable air quality laws and regulations including local and air district ordinances and rules.

2020 MTP/SCS

AB 375 requires SACOG to include SCSs in its RTP updates to describe how the GHG emissions reductions set by CARB would be met through land use and transportation planning. In 2015, the SACOG Board adopted the Sacramento Region Transportation Climate Adaptation Plan as part of an update to the 2016 MTP/SCS. The plan provides high-level action and identifies key vulnerabilities to climate change in the region’s transportation infrastructure and provides recommendations for best practices and strategies to meet the state targets for reducing GHG emissions from light-duty vehicles. In 2019, SACOG approved and adopted the 2020 MTP/SCS and accompanying documents. 2020 MTP/SCS is the most recent update to its RTP, which includes implementation of transportation projects and Climate Initiatives Program that, together, would result in emissions from light-duty vehicles that meet the region’s GHG reduction targets, per AB 375. It provides for both priority and timely completion/implementation of the transportation control measures (TCMs) in the applicable SMAQMD air quality plans identified below.

SMAQMD and Yolo-Solano Air Quality Management District SIPs and Redesignation Requests

The SMAQMD and YSAQMD are the designated local authorities responsible for monitoring air pollution within the applicable portion of the Sacramento Valley Air Basin (SVAB) where the project would occur. The SMAQMD and YSAQMD develop and administer plans and programs, including SIPs and redesignation requests, to reduce air pollution levels below the health-based standards established by the state and federal governments.

On January 22, 2009, the SMAQMD adopted the 2009 Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan. This plan set out a strategy for attaining the 1997 O_3 NAAQS and was submitted by CARB to the USEPA on April 17, 2009 as a revision to the California SIP and included revisions to the area's motor vehicle emissions budgets as well as 43 TCMs. The 2016 MTP/SCS included these TCMs and all of them were completed on or before 2018.

In 2010, SMAQMD prepared the particulate matter less than 10 microns in diameter, respirable particulate matter (PM_{10}) Implementation/Maintenance Plan and Redesignation Request for Sacramento County to fulfill the requirements for USEPA to redesignate Sacramento County from nonattainment to attainment/maintenance for the PM_{10} NAAQS. The USEPA approved SMAQMD's request through FR Vol. 78, No. 187 in 2013.

Then, in 2013, SMAQMD prepared the particulate matter less than 2.5 microns in diameter, respirable particulate matter ($PM_{2.5}$) Implementation/Maintenance Plan and Redesignation Request. It was approved by CARB and submitted to the USEPA to fulfill the requirements to redesignate Sacramento County from nonattainment to attainment/maintenance for the $PM_{2.5}$ NAAQS. In January 2017, USEPA recognized Sacramento County as attaining the 2006 $PM_{2.5}$ NAAQS; however, the nonattainment designation is still in effect.

On September 28, 2017, SMAQMD submitted the Sacramento Federal Ozone Nonattainment Area Redesignation Substitution Request for the 1979 1-hour O_3 Standard. This request demonstrated that the Sacramento Federal Ozone Nonattainment Area (SFNA) met the USEPA's requirements, based on ambient air quality monitoring to be redesignated as an attainment area for the revoked 1979 1-hour O_3 NAAQS. The SFNA was designated as a "severe" nonattainment area for the 1-hour standard, that was replaced by the more stringent 1997 8-hour O_3 NAAQS. The USEPA found that the SFNA attained the revoked 1-hour O_3 standard on October 18, 2012 (77 FR 64036). However, the District is still subject to anti-backsliding requirements for the 1-hour standard unless a Redesignation Substitution Request is approved by USEPA. Once approved, the request will redesignate the SFNA to attainment for the revoked 1-hour O_3 standard and remove the obligations associated with it.

The SMAQMD, along with the other air districts within the SFNA, developed and submitted a plan to demonstrate attainment of the 2008 8-hour NAAQS of 75 parts per billion (ppb) by an attainment year of 2024. The Sacramento Regional 2008 NAAQS 8-Hour Ozone Attainment Plan and Reasonable Further Progress Plan were approved by the SMAQMD Board on August 24, 2017, and by CARB on November 16, 2017. This plan sets motor vehicle emissions budgets and demonstrates how it complies with VMT emissions offset requirements. It was then submitted to the USEPA, along with CARB's 2018 Updates to the California SIP, on December 18, 2017 as a revision to the California SIP. On October 29, 2020, the USEPA published in the Federal Register (85 FR 68533) a proposal to approve all or portions of the submitted plans for the Sacramento Metro nonattainment area. Comments on the proposal were collected through November 30, 2020. Once approved by the USEPA, the plan would meet all the applicable ozone nonattainment area requirements, and the plan's contingency measure requirements would be conditionally approved. The 2023 and 2024 motor vehicle emissions budgets would also be approved.

The Sacramento Regional 2008 NAAQS 8-Hour Ozone Attainment Plan and Reasonable Further Progress Plan includes one TCM that will be in place through 2024. SMAQMD's "Spare the Air" program is a year-round public education program with an episodic ozone reduction element during the summer ozone season and a general awareness during the rest of the year. It is designed to inform people when air quality is unhealthy and achieve voluntary emission reductions by encouraging them to reduce vehicle trips (i.e., VMT).

SMAQMD Rules and Regulations

SMAQMD has adopted rules and regulations applicable to construction projects in the region. These include rules/regulations applicable to visible emissions (Rule 401), fugitive dust emissions (Rule 403) application of architectural coatings (Rule 442), and cutback and emulsified asphalt paving materials (Rule 453).

In addition, SMAQMD has developed a construction mitigation protocol and standard levels. When the levels are exceeded, all feasible mitigation will be applied as required by CEQA. SMAQMD-recommended feasible MMs include enhanced exhaust controls for on-site equipment.

2.2.6.2 Affected Environment

The analysis summarized in this section is based on the Air Quality Report prepared for the project (Caltrans 2022x). The project area is within the city of Sacramento in Sacramento County, Yolo County, and Solano County and is within the SVAB which, in addition to Sacramento County includes Yolo, Yuba, Sutter, Colusa, Glenn, Butte, Tehama, and Shasta counties and parts of Solano and Placer counties. Air quality regulation in the SVAB is administered by nine different air quality management districts: Sacramento Metro, Feather River, Placer, Butte, Shasta, Tehama, Glenn, Colusa, and Yolo-Solano. The Sacramento Metropolitan Air District and the Yolo-Solano Air Quality Management District are responsible for air quality within the project area.

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 from one region to another, contributing to air quality problems downwind of source regions. Furthermore, mountains can act as a barrier that prevents ozone from dispersing.

The climate of the SVAB is Mediterranean in character, with mild, rainy winter weather from November through March and warm to hot, dry weather from May through September. Sacramento Valley temperatures range from 20 to 115°F and the average annual rainfall is 20 inches. The topographic features giving shape to the SVAB are the Coast Range to the west, the Sierra Nevada to the east, and the Cascade Range to the north. These mountain ranges channel winds through the SVAB, but also inhibit the dispersion of pollutant emissions.

The predominant annual and summer wind pattern in the Sacramento Valley is the full sea breeze, commonly referred to as Delta breezes. These cool winds originate from the Pacific Ocean and flow through a sea-level gap in the Coast Range called the Carquinez Straits. In the winter (December to February), northerly winds predominate. Wind directions in the Sacramento Valley are influenced by the predominant wind flow pattern associated with each season. During about half the days from July through September, however, a phenomenon called the “Schultz Eddy,” which is a large isotropic vertical-axis eddy on the north side of the Carquinez Straits, prevents the Delta breezes from transporting pollutants north and out of the Sacramento Valley and causes the wind pattern to circle back south, which tends to keep air pollutants in the Sacramento Valley.

Existing Air Quality

The USEPA and CARB designate air basins where ambient air quality standards are exceeded as “nonattainment” areas. If standards are met, the area is designated as an “attainment” area. If there is inadequate or inconclusive data to make a definitive attainment designation, they are considered “unclassified.” National nonattainment areas are further designated as marginal, moderate, serious, severe, or extreme as a function of deviation from standards. Attainment status is based on the NAAQS and the California Ambient Air Quality Standards (CAAQS).

The Clean Air Act (CAA) identifies two types of NAAQS. Primary standards provide public health protection, including protecting the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings (USEPA 2022c). The CAAQS are equal to or more stringent than the NAAQS and include pollutants for which national standards do not exist. Table 2.2-4 presents the applicable NAAQS and CAAQS for the project area.

Table 2.2-4. California and National Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards	National Standards	
		Concentration	Primary	Secondary
Ozone (O_3)	1 hour	0.09 ppm (180 µg/m^3)	—	Same as primary standard
	8 hours	0.070 ppm (137 µg/m^3)	0.070 ppm (137 µg/m^3)	
Respirable Particulate Matter (PM_{10})	24 hours	50 µg/m^3	150 µg/m^3	Same as primary standard
	Annual arithmetic mean	20 µg/m^3	—	
Fine Particulate Matter ($PM_{2.5}$)	24 hours	—	35 µg/m^3	Same as primary standard
	Annual arithmetic mean	12 µg/m^3	12 µg/m^3	
Carbon monoxide (CO)	1 hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	—
	8 hours	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	—
	8 hours (Lake Tahoe)	6 ppm (7 mg/m^3)	—	—
Nitrogen dioxide (NO_2)	1 hour	0.18 ppm (339 µg/m^3)	100 ppb (188 µg/m^3)	—
	Annual arithmetic mean	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)	Same as primary standard
Sulfur dioxide (SO_2)	1 hour	0.25 ppm (655 µg/m^3)	75 ppb (196 µg/m^3)	—
	3 hours	—	—	0.5 ppm (1,300 µg/m^3)
	24 hours	0.04 ppm (105 µg/m^3)	0.14 ppm (for certain areas)	—
	Annual arithmetic mean	—	0.030 ppm (for certain areas)	—
Lead (Pb)	30-day average	1.5 µg/m^3	—	—
	Calendar quarter	—	1.5 µg/m^3	Same as Primary Standard
	Rolling 3-month average	—	0.15 µg/m^3	
Visibility-reducing particles	8 hours	See Footnote [1]	No National Standards	
Sulfates	24 hours	25 µg/m^3		
Hydrogen sulfide	1 hours	0.03 ppm (42 µg/m^3)		
Vinyl chloride	24 hours	0.01 ppm (26 µg/m^3)		

Source: USEPA 2022c
Note: 1. 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.
Key: ppb = parts per billion, µg/m3 =micrograms per liter, PM_{10} = particulate matter less than 10 microns in diameter, $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter, mg/m3 = milligrams per cubic meter

As shown in Table 2.2-5, Yolo County is in attainment of all other NAAQS. Sacramento County is designated as Maintenance (Moderate) for PM_{10} and Nonattainment (Moderate) for $PM_{2.5}$. For the more stringent CAAQS, both Sacramento County and Yolo County are designated Nonattainment for O_3 and PM_{10} and are in attainment of all other State standards.

Table 2.2-5. Attainment Status for Sacramento/Yolo Counties

Pollutant	State Status	Federal Status
Ozone (O_3)	Nonattainment	Nonattainment-severe 15
Particulate Matter (PM10)	Nonattainment	Sacramento County: Maintenance – Moderate Yolo County: Attainment – Unclassifiable
Fine Particulate Matter ($PM_{2.5}$)	Sacramento County: Attainment Yolo County: Unclassified	Sacramento County: Nonattainment – Moderate Yolo County: Nonattainment – Moderate
Carbon Monoxide (CO)	Attainment	Unclassifiable/Attainment
Nitrogen Dioxide (NO_2)	Attainment	Unclassifiable/Attainment
Sulfur Dioxide (SO_2)	Attainment	Unclassifiable/Attainment
Sulfates	Attainment	Unclassifiable/Attainment
Lead	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

The California Air Resources Board maintains the only monitoring station that collects ambient air quality data in Sacramento County. The nearest monitoring location is found in Sacramento County approximately 0.75-mile northeast of the project location. Data from the monitoring station are shown in Table 2.2-6 and Figure 2.2-3 shows the monitoring station location.

Sensitive receptors are places where people susceptible to air pollution may stay for long periods of time. These locations include land uses such as residential, schools, playgrounds, parks, childcare centers and hospitals. There are several land uses and many residences that are within close vicinity of the project. The project limits are depicted with a map in Appendix I.

Table 2.2-6. Criteria Air Pollutants Data (Sacramento T Street Monitoring Station)

Pollutant	Averaging Time	Applicable Standard	2017	2018	2019	2020	2021
Ozone (O_3)	1-Hour	Maximum Concentration (ppm)	0.107	0.097	0.100	0.112	0.091
		Number of Days State Standard Exceeded	0	0	0	0	0
	8-Hour	Maximum Concentration (ppm)	0.077	0.084	0.074	0.076	0.080
		Number of Days National Standard Exceeded (>0.075ppm)	3	1	1	3	1
		Number of Days State Standard Exceeded (>0.07ppm)	3	1	1	3	1
Particulate Matter 10 Microns or Less (PM_{10})	24-Hour	Maximum Concentration ($\mu g/m^3$)	150.3	309.5	179.1	298	132
		Number of Days National Standard Exceeded	0	6	1	4	0
		Number of Days State Standard Exceeded	0	22	24	25	59
	Annual	State Annual Average (20 $\mu g/m^3$)	0	29.7	20.7	20.2	31.2
Particulate Matter 2.5 Microns or Less ($PM_{2.5}$)	24-Hour	Maximum Concentration ($\mu g/m^3$)	46.0	263.3	37.1	30.7	26.2
		Number of Days State Standard Exceeded	6	0	0	0	0
	Annual	National Annual (12.0 $\mu g/m^3$)	9.2	11.4	7.7	14.8	8.8
Carbon Monoxide (CO)*	1-Hour	Maximum Concentration (ppm)	1.8	3.2	1.4	4.3	2.2
		Number of Days National Standard Exceeded	0	0	0	0	0
		Number of Days State Standard Exceeded	0	0	0	0	0
	8-Hour	Maximum Concentration (ppm)	1.2	3.0	1.3	1.6	1.3
		Number of Days State Standard Exceeded	0	0	0	0	0

Source: http://www.epa.gov/airdata/
Note: *Carbon monoxide concentrations have not been measured at the T Street station since 2006; the nearest monitoring station is located approximately 1 mile north to the project location at 100 Bercut Drive, Sacramento
Key: µg/m3 =micrograms per liter, ppm = parts per million

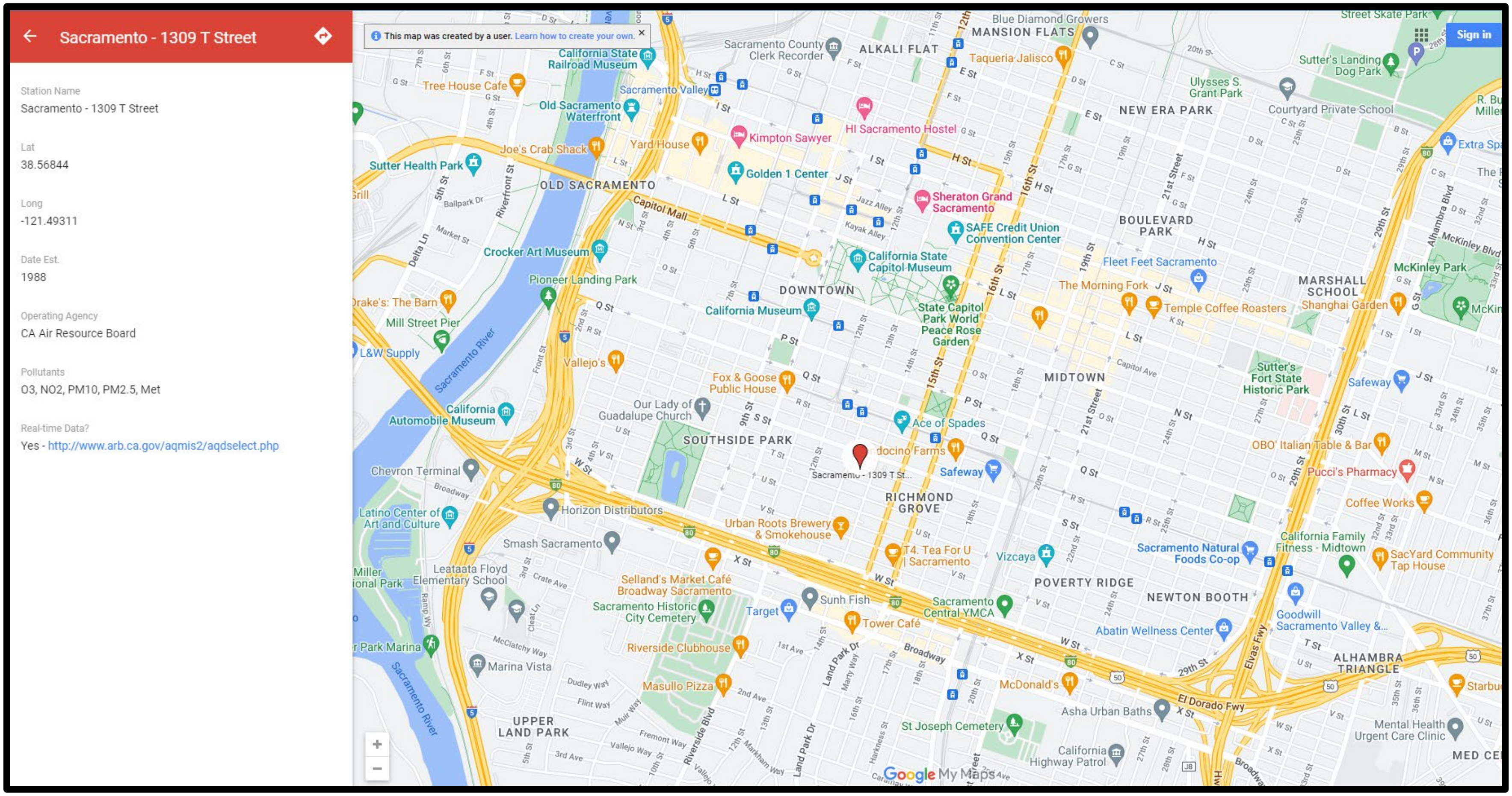


Figure 2.2-3. Air Quality Monitoring Station Located in Downtown Sacramento

Sensitive receptors are places where people susceptible to air pollution may stay for long periods of time. These locations include land uses such as residential, schools, playgrounds, parks, childcare centers and hospitals. There are several land uses and many residences that are within close vicinity of the project. The project limits are depicted with a map in Appendix I. Sensitive receptors within 500 feet of the Project are shown in Table 2.2-7.

Table 2.2-7. Sensitive Receptors Located Within 500 ft of the Project Site.

Receptor	Description	Distance Between Receptor and Project (ft)
UC Davis	University	500
Toad Hollow Dog Park	Park	300
Play Fields Park	Park	350
Playground at New Harmony Mutual Housing Community	Playground	350
Merryhill Preschool	Preschool	500
Yolo High School	School	450
Westacre Park	Playground	150
River Otter Park	Park	100
Davis Urgent Care	Medical Facility	400
Concentra Urgent Care	Medical Facility	250
Davita West	Medical Facility	250
Sacramento Valley Charter School	School	200
River Bend Nusring Center	Medical Facility	300

Mobile Source Air Toxics

In addition to the criteria air pollutants, the US EPA also regulates a list of air toxics (64 FR 38706). Toxic air pollutants or hazardous air pollutants (HAPs) are known to cause or suspected of causing cancer or other serious health ailments. Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that US EPA regulate 188 air toxics, also known as hazardous air pollutants. In 2001, US EPA issued its first Mobile Source Air Toxics Rule, which identified 21 MSAT compounds as being hazardous air pollutants that required regulation. A subset of these MSAT compounds was identified as having the greatest influence on health. EPA issued the second MSAT Rule in 2007, which generally supported the findings of the first rule and provided additional recommendations of compounds having the greatest impact on health. The rule also identified several engine emission certification standards that must be implemented. US EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007) and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS).

The 21 HAPs identified by US EPA as MSATs are emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as by-products. Metal air toxics result from engine wear or from impurities in oil or gasoline. US EPA has identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA). These are acrolein, benzene, 1,3-butadiene, diesel particulate matter (DPM) that includes diesel exhaust organic gases, formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future EPA rules.

The US EPA is the lead federal agency responsible for administering the Clean Air Act and has certain responsibilities regarding the health effects of MSATs. In its 2001 rule (66 FR 17229), US EPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline program, national low emission vehicle standards, Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. The agency is preparing another rule under authority of Clean Air Act Section 202(l) that will address these issues and could adjust the full 21 and primary seven MSATs.

FHWA's ongoing work in air toxics includes a research program to better understand and quantify the contribution of mobile sources to air emissions, the establishment of policies for addressing mobile source emissions in environmental reports, and the assessment of scientific literature on health impacts associated with motor vehicle emissions. California’s vehicle emission control and fuel standards are more stringent than federal standards and are effective earlier. CARB found that DPM contributes over 70 percent of the known risk from air toxics and poses the greatest cancer risks among all identified air toxics. Diesel trucks contribute more than half of the total diesel combustion sources. In response, CARB adopted a Diesel Risk Reduction Plan with control measures to reduce the overall DPM emissions by about 85 percent from 2000 to 2020. Part of the plan included recently adopted regulation that requires operators of truck and bus fleets in California to retrofit or replace vehicles to meet US EPA NOX and $PM_{2.5}$ emission standards for 2010 model trucks (13 C.C.R. section 2025). Implementation of this regulation begins in 2014. By 2023, nearly all trucks and buses operating in California will need to meet 2010 model year engine emission standards.

Emissions of MSATs are anticipated to decrease substantially in future years. According to an FHWA analysis using EPA's MOVES2010b model combined reduction of 83 percent in the total emissions for the priority MSATs from 2010 to 2050 is projected. This would occur while vehicle-miles travelled (VMT) is assumed to increase by 102 percent. The combined State and federal regulations are expected to result in greater emission reductions, more quickly, than the FHWA analysis indicates.

2.2.6.3 Environmental Consequences

Regional Conformity

Regional conformity requires planned and programmed transportation projects be included in a regional emissions analysis; however, certain types of projects are exempt from conformity requirements. These project types are found by the USEPA to be neutral from an air quality or emissions standpoint and are listed in the Conformity Regulations at 40 CFR 93.126, 40 CFR 92.127, and 40 CFR 92.128. If a project is exempt, it may need little or no conformity analysis and does not need to be individually listed and considered in the regional emissions analysis (i.e., regional conformity modeling).

Each of the Build Alternatives would improve operations, reduce congestion, and increase vehicle occupancy within the travel corridor. Because the proposed alternatives would add lanes, they would add roadway capacity, and would not be considered exempt from either regional or project-level conformity requirements. Therefore, the project requires an individual listing in the RTP (i.e., 2020 MTP/SCS) and their associated regional emissions analyses to demonstrate regional conformity.

Currently, the project is listed in the 2020 MTP/SCS financially constrained RTP (Project ID# CAL21276), see Appendix J The project's design concept and scope are consistent with the project description in the RTP and TIP.

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 conformity is demonstrated through a hot-spot analysis where Build and No-Build emissions are modeled, both with and without any MMs committed to in the RTP.

The project area is in an attainment/unclassified area for CO, an attainment/maintenance area for PM_{10}, and a nonattainment area for $PM_{2.5}$. Thus, a project-level conformity analysis applies to the project for both PM_{10} and $PM_{2.5}$ under 40 CFR 93.109. Hot-spot analysis for PM_{10} and $PM_{2.5}$ is only required for projects found to meet the definition of a Project of Air Quality Concern (POAQC) through interagency consultation with the MPO's the Project Level Conformity Group (PLCG). The project was found not to be a POAQC by SACOG's PLCG on October 15, 2021 by EPA and on October 18, 2021 by FHWA (see Appendix J); therefore, a hot-spot analysis is not required.

40 CFR 93.123(c)(5) states that: "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 5 years or less at any individual site." Because construction of the project is expected to last less than 5 years, an evaluation of CO, PM_{10}, and

$PM_{2.5}$ emissions during project construction is not required for project-level conformity determination.

No Build Alternative 1

Construction

Under No Build Alternative 1, managed lanes and transportation improvements would not be constructed. There would be no construction emissions.

Operation

Under No Build Alternative 1, the managed lanes and transportation improvements would not be constructed. However, vehicles would continue to travel within the project area contributing to long-term emissions. As shown in Table 2.2-10 and Table 2.2-8, PM_{10} and $PM_{2.5}$ emissions are calculated to increase by up to 22.2 percent by year 2049 under No Build Alternative 1 conditions. The increase is not considered substantial.

Build Alternatives 2a and 2b

Short-Term Construction Impacts

Construction-related emissions are generally short-term in duration but may still cause adverse air quality impacts.

Construction Dust

Dust would be generated during grading and construction operations. The amount of dust generated would be highly variable and is dependent on the size of the area disturbed, amount of activity, soil conditions and meteorological conditions.

Although grading and construction activities would be temporary, they would have the potential to cause both nuisance and health air quality impacts. PM_{10} is the pollutant of greatest concern associated with dust. If uncontrolled, elevated PM_{10} levels could occur downwind of actively disturbed areas. In addition, dust fall on adjacent properties could be a nuisance. If uncontrolled, dust generated by grading and construction activities would have an adverse effect on air quality. The project would comply with rules and regulations pertaining to the control of fugitive dust and prevention of public nuisance published by the SMAQMD and YSAQMD. In addition, Standard Measures (Appendix E) would include AQ-1 and GHG-1. Therefore, there would be no adverse effect from fugitive dust emissions during the construction of the project.

Construction Equipment Exhaust

Daily Maximum construction emissions were estimated using the latest version of Caltrans' CAL-CET2021 emissions model which uses emission factors from EMFAC2021 developed by CARB. Detailed construction plans were not available at the time of this analysis. Therefore, equipment quantities and construction phases provided by CAL-CET2021 were used along with maximum project durations provided by the Caltrans' design engineering team. Appendix J lists all the construction inputs provided and entered into CAL-CET2021. Inputs to the model included the construction start date, total construction cost, estimated working days, and project length. Table 2.2-8 shows the maximum construction emissions per project phase.

Table 2.2-8. Maximum Construction Emissions

Project Phase	Reactive Organic Gases	Nitrogen Oxides	Particulate Matter 10 Microns or Less	Particulate Matter 2.5 Microns or Less
Grubbing/Land Clearing	10.0 lbs/day	67.4 lbs/day	214.1 lbs/day	25.2 lbs/day
Roadway Excavation/Removal	13.8 lbs/day	107.7 lbs/day	96.0 lbs/day	15.0 lbs/day
Structure Excavation/Removal	10.6 lbs/day	59.2 lbs/day	135.7 lbs/day	16.4 lbs/day
Base/Subbase/Imported Borrow	15.2 lbs/day	129.7 lbs/day	139.6 lbs/day	20.2 lbs/day
Structure Concrete	11.7 lbs/day	67.8 lbs/day	4.3 lbs/day	4.2 lbs/day
Paving	13.7 lbs/day	105.9 lbs/day	5.7 lbs/day	5.5 lbs/day
Drainage/Utilities/Sub-Grade	11.0 lbs/day	48.5 lbs/day	67.8 lbs/day	4.4 lbs/day
Traffic Signalization	17.4 lbs/day	137.3 lbs/day	6.6 lbs/day	6.4 lbs/day
Total (Tons/Construction project)	2.0	13.5	6.1	1.3
SMAQMD Standard Levels	—	85 lbs/day	80 lbs/day	82 lbs/day
YSAQMD Standard Levels	55 lbs/day	55 lbs/day	80 lbs/day	—

Caltrans has statewide jurisdiction on projects within its right-of-way. Since the setting for projects varies extensity across the state, Caltrans has not and will not develop standard levels. Further, because most air district thresholds have not been established by regulation or by delegation from a federal or state agency with regulatory authority over Caltrans, Caltrans is not required to adopt those standard levels in Caltrans' documents. The SMAQMD and YSAQMD standard levels are provided for reference.

Construction equipment and associated heavy-duty truck traffic generate diesel exhaust. Diesel exhaust poses both a health and nuisance impact to nearby receptors. These construction activities are expected to occur during a relatively short time and therefore would not have an adverse effect.

Long-Term Operational Impacts

The operational emissions analysis compares emissions for existing/baseline conditions to the forecasted conditions for the No-Build and Build alternatives given the project's opening year (2029), RTP horizon year (2040), and design year (2049) with and without an HOV-HOV connector based on the traffic data provided from the Traffic Forecasting from Caltrans (Table 2.2-9). Air pollutant emissions associated with the roadways in the project area were estimated using specific traffic data and conditions provided by the Caltrans District 3 traffic forecasting and the CT-EMFAC2021 emission model.

Table 2.2-9. Project Total Average Annual Daily Traffic, Truck Average Annual Daily Traffic, and Vehicle Miles Traveled for Opening, Metropolitan Transportation Improvement Program, and Design Years

Opening Year 2029	Alt 1 (No Build)	Alt 2 (HOV)	Alt 3 (HOT)	Alt 4 (HOT 3+)	Alt 5 (Express Lane)	Alt 6 (Transit)	Alt 7 (Repurpose #1 Lane)
AADT	157,663	173,786	173,806	171,958	169,971	160,847	156,565
Truck % (Alt Option a)	7.7						
Truck % (Alt Option b)	7.4						
Truck AADT (Alt Option a)	11,667	–13,352*	13,354*	13,212*	13,059*	12,359*	12,029*
Truck AADT (Alt Option b)	11,667	12,860	12,862	12,725	12,578	11,903	11,586
VMT	3,880,995	4,237,651	4,239,821	4,196,181	4,176,124	3,953,571	3,867,187

MTIP Year 2040	Alt 1 (No Build)	Alt 2 (HOV)	Alt 3 (HOT)	Alt 4 (HOT 3+)	Alt 5 (Express Lane)	Alt 6 (Transit)	Alt 7 (Repurpose #1 Lane)
AADT	162,995	175,741	175,832	173,350	172,582	163,081	159,511
Truck % (Alt Option a)	7.7						
Truck % (Alt Option b)	7.4						
Truck AADT (Alt Option a)	12,062	13,504*	13,511*	13,320*	13,261*	12,531*	12,257*
Truck AADT (Alt Option b)	12,062	13,005	13,012	12,828	12,771	12,068	11,804
VMT	4,026,381	4,324,520	4,329,187	4,272,099	4,252,533	4,025,319	3,931,677

Design Year 2049	Alt 1 (No Build)	Alt 2 (HOV)	Alt 3 (HOT)	Alt 4 (HOT 3+)	Alt 5 (Express Lane)	Alt 6 (Transit)	Alt 7 (Repurpose #1 Lane)
AADT	180,290	190,023	190,807	187,630	186,647	176,866	174,064
Truck % (Alt Option a)	7.7						
Truck % (Alt Option b)	7.4						
Truck AADT (Alt Option a)	13,341	14,599*	14,624*	14,465*	14,318*	13,587*	13,372*
Truck AADT (Alt Option b)	13,341	14,062	14,120	13,885	13,812	13,088	12,881
VMT	4,495,673	4,683,131	4,691,980	4,642,888	4,599,005	4,381,640	4,276,831

Note: *The truck percentage numbers were varied: they reflect no connector between I-80 and SR-50
Key: AADT=average annual daily traffic; HOT=high-occupancy toll; HOV=high-occupancy vehicle; HOT= MTIP=Metropolitan Transportation Improvement Program; VMT=vehicle miles traveled,

Carbon Monoxide Analysis

U.S. EPA declared that transportation conformity requirements related to CO in Sacramento ended on June 1, 2018. That date marked 20 years from the redesignation of the areas to attainment and implementation of a maintenance plan. The approved maintenance plan for Sacramento did not extend the maintenance plan period beyond 20 years from redesignation. Consequently, Transportation Conformity requirements for CO ceased to apply after June 1, 2018 (i.e., 20 years after the effective date of the U.S. EPA's approval of the first ten-year maintenance plan and redesignation of the areas to attainment for the CO NAAQS.

$PM_{2.5}$/PM_{10} Analysis

The proposed project has undergone Interagency Consultation regarding POAQC determination. Interagency Consultation participants concurred that the project is not a POAQC on October 15, 2021 by EPA and on October 18, 2021 by FHWA. The proposed project is not considered a POAQC because it does not meet the definition as defined in U.S. EPA's Transportation Conformity Guidance. Therefore, PM hot-spot analysis is not required.

The project is located in a particulate matter $PM_{2.5}$ maintenance area and it has been determined that the project is not a project of air quality concern. Project-level hot-spot analysis for particulate matter is therefore not required for a conformity determination.

Table 2.2-10 and Table 2.2-11 show that the total daily PM_{10} and $PM_{2.5}$ emissions for the Build and No Build alternatives in the opening year and the horizon year would be higher than existing conditions. However, the increase of total daily PM_{10} emissions is estimated to be 9. percent, 6.4 percent, and 3.1 percent of PM_{10} for Alternative 2b with opening year 2029, MTP year 2040, and Design year 2049, respectively. This increase is not considered substantial.

$PM_{2.5}$ emissions for Build Alternative 2b are estimated to increase 8.6 percent, 5.6 percent, 1.9 percent with opening year 2029, MTP year 2040, and Design year 2049, respectively. It is anticipated that the decreases of PM_{10} and $PM_{2.5}$ emissions for Build Alternative 2a would be associated with less traffic generated without an HOV-HOV connector. Therefore, the difference between the Build Alternatives and the No Build Alternative 1 would not be significant in terms of PM_{10} and $PM_{2.5}$ in regard to the increase of total AADT between the Build Alternatives and the No Build Alternative 1 with an HOV-HOV connector.

Table 2.2-10. Total Daily Particulate Matter (10 Microns or Less) Emissions with and *without an HOV-HOV Connector

Opening Year 2029	HOV Connector	Baseline (Existing Year 2019)	Alt 1 (No Build)	Alt 2 (HOV)	Alt 3 (HOT)	Alt 4 (HOT 3+)	Alt 5 (Express Lane)	Alt 6 (Transit)	Alt 7 (Repurpose #1 Lane)
PM_{10} Emission (lb)	Alt Option a	610.8	632.2	597.4	597.2	593.4	589.7	561.5	544.0
	Alt Option b			689.9	687.9	672.9	648.6	628.6	628.4
% Change between Build/No-Build	Alt Option a	N/A	N/A	-5.5	-5.5	-6.1	-6.7	-11.2	-14.0
	Alt Option b			9.1	8.8	6.4	2.6	-0.6	-0.6
% Change between Existing/Build	Alt Option a	N/A	3.5	-2.2	-2.2	-2.9	-3.5	-8.1	-10.9
	Alt Option b			13.0	12.6	10.2	6.2	2.9	2.9

MTIP Year 2040	HOV Connector	Baseline (Existing Year 2019)	Alt 1 (No Build)	Alt 2 (HOV)	Alt 3 (HOT)	Alt 4 (HOT 3+)	Alt 5 (Express Lane)	Alt 6 (Transit)	Alt 7 (Repurpose #1 Lane)
PM_{10} Emission (lb)	Alt Option a	N/A	660.6	609.3	607.6	597.6	594.4	571.6	555.8
	Alt Option b			703.0	702.4	690.9	686.3	660.8	642.3
% Change between Build/No-Build	Alt Option a	N/A	N/A	-7.8	-8.0	-9.5	-10.0	-13.5	-15.9
	Alt Option b			6.4	6.3	4.6	3.9	0.1	-2.8
% Change between Existing/Build	Alt Option a	N/A	8.2	-0.2	-0.5	-2.2	-2.7	-6.4	-9.0
	Alt Option b			15.1	15.0	13.1	12.4	8.2	5.2

Design Year 2049	HOV Connector	Baseline (Existing Year 2019)	Alt 1 (No Build)	Alt 2 (HOV)	Alt 3 (HOT)	Alt 4 (HOT 3+)	Alt 5 (Express Lane)	Alt 6 (Transit)	Alt 7 (Repurpose #1 Lane)
PM_{10} Emission (lb)	Alt Option a	N/A	746.3	668.6	671.5	665.5	659.4	630.8	613.8
	Alt Option b			772.0	775.0	764.4	762.8	729.1	709.0
% Change between Build/No-Build	Alt Option a	N/A	N/A	-10.4	-10.0	-10.8	-11.6	-15.5	-17.8
	Alt Option b			3.5	3.9	3.0	2.2	-2.3	-5.0
% Change between Existing/Build	Alt Option a	N/A	22.2	9.5	9.9	9.0	8.0	3.3	0.5
	Alt Option b			26.4	26.9	25.1	24.9	19.4	6.1

Table 2.2-11. Total Daily Particulate Matter (2.5 Microns or Less) Emissions with and *without an HOV-HOV Connector

Opening Year 2029	HOV Connector	Baseline (Existing Year 2019)	Alt 1 (No Build)	Alt 2 (HOV)	Alt 3 (HOT)	Alt 4 (HOT 3+)	Alt 5 (Express Lane)	Alt 6 (Transit)	Alt 7 (Repurpose #1 Lane)
$PM_{2.5}$ Emission (lb)	Alt Option a	139.2	127.5	120.0	119.8	119.3	118.9	113.8	110.9
	Alt Option b			138.5	137.6	135.5	134.5	131.4	128.0
%Change between Build/No-Build	Alt Option a	N/A	N/A	-6.3	-6.0	-6.4	-6.7	-10.7	-13.0
	Alt Option b			8.6	7.9	6.3	5.5	3.1	0.4
%Change between Existing/Build	Alt Option a	N/A	-8.4	-13.7	-13.9	-14.3	-14.6	-18.2	-20.3
	Alt Option b			-0.5	-1.1	-2.7	-3.4	-5.6	-8.0

MTIP Year 2040	HOV Connector	Baseline (Existing Year 2019)	Alt 1 (No Build)	Alt 2 (HOV)	Alt 3 (HOT)	Alt 4 (HOT 3+)	Alt 5 (Express Lane)	Alt 6 (Transit)	Alt 7 (Repurpose #1 Lane)
$PM_{2.5}$ Emission (lb)	Alt Option a	N/A	128.2	117.5	116.8	114.6	113.9	110.9	108.0
	Alt Option b			135.4	135.0	132.5	131.4	128.2	124.8
%Change between Build/No-Build	Alt Option a	N/A	N/A	-8.3	-8.9	-10.6	-11.2	-13.5	-15.8
	Alt Option b			5.6	5.3	3.4	0.8	0.1	-2.7
%Change between Existing/Build	Alt Option a	N/A	-7.9	-15.6	-16.0	-17.7	-18.2	-20.3	-22.4
	Alt Option b			-2.7	-3.0	-4.8	-5.6	-7.9	-10.3

Design Year 2049	HOV Connector	Baseline (Existing Year 2019)	Alt 1 (No Build)	Alt 2 (HOV)	Alt 3 (HOT)	Alt 4 (HOT 3+)	Alt 5 (Express Lane)	Alt 6 (Transit)	Alt 7 (Repurpose #1 Lane)
$PM_{2.5}$ Emission (lb)	Alt Option a	N/A	145.4	128.4	129.1	128.1	127.0	122.5	118.4
	Alt Option b			148.1	148.5	146.8	146.7	141.5	136.6
%Change between Build/No-Build	Alt Option a	N/A	N/A	-11.7	-11.2	-11.9	-12.7	-15.7	-18.6
	Alt Option b			1.9	2.1	1.0	0.9	-2.7	-6.1
%Change between Existing/Build	Alt Option a	N/A	4.5	-7.8	-7.3	-8.0	-8.8	-12.0	-14.9
	Alt Option b			6.4	6.7	5.5	5.4	1.7	-1.9

Mobile Source Air Toxics

FHWA released updated guidance in Jan. 18, 2023 for determining when and how to address MSAT impacts in the NEPA process for transportation projects. FHWA identified three levels of analysis:

- No analysis for exempt projects or projects with no potential for meaningful MSAT effects;
- Qualitative analysis for projects with low potential MSAT effects; and
- 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 creating a facility that is likely to substantially increase emissions. The large majority of projects fall into this category.

Projects with high potential MSAT effects include those that:

- Create or significantly alter a major intermodal freight facility that has the potential to concentrate high levels of Diesel Particulate Matter in a single location; or
- Create new or add significant capacity to urban highways such as interstates, urban arterials, or urban collector-distributor routes with traffic volumes where the AADT is projected to be in the range of 140,000 to 150,000, or greater, by the design year; and
- Are proposed to be located in proximity to populated areas or, in rural areas, in proximity to concentrations of vulnerable populations (i.e., schools, nursing homes, hospitals).

The latest version of CT-EMFAC, CT-EMFAC2021, was used to estimate emissions of benzene, 1,3-butadiene, acetaldehyde, formaldehyde, acrolein, ethylbenzene, naphthalene, DPM, and polycyclic organic matter. Please note that appendix D illustrates the extent of the area considered in the MSAT analysis. Traffic activity data were estimated for each of different periods of a representative day in the baseline, opening 2029, and horizon 2049 years. Emissions were estimated for all MSATs using CT-EMFAC2021, based on EMFAC2021 and speciation factors provided by CARB and U.S. EPA.

As shown in Table 2.2-12, MSAT emission rates are anticipated to decrease substantially, especially for diesel PM, by the opening year of 2029 and even further by the horizon year of 2049. The area surrounding the project is not heavily industrialized and comprises only approximately six percent heavy trucks. The project would not substantially increase the percentage of trucks traveling along I-80 of the project limits, and local truck emissions may in fact decrease in future analysis years 2029 and 2049 due to penetration of electric heavy duty trucks. In sum, under all Build Alternatives in the opening year and design year it is expected there would be negligible increases in MSAT emissions relative to the No Build Alternative due to the dispersion across the SACOG region and to EPA's MSAT reduction programs.

Moreover, U.S. EPA regulations for vehicle engines and fuels will cause overall MSATs to decline significantly over the next several decades. Based on regulations now in effect, an analysis of national trends with EPA's MOVES3 model forecasts a combined reduction of over 76 percent in the total annual emission rate for the priority MSAT from 2020 to 2060 while vehicle-miles of travel are projected to increase by over 31 percent. This will both reduce the background level of MSAT as well as the possibility of even minor MSAT emissions from this project.

Table 2.2-12. Mobile Source Air Toxic Emission Rates

Analysis Year/ Scenario		1,3-butadiene	Acetaldehyde	Acrolein	Benzene	Diesel PM	Ethylbenzene	Formaldehyde	Naphthalene	Polycyclic organic matter
2019	Baseline (Existing Conditions)	0.84	3.89	0.08	11.84	24.57	4.59	8.87	0.77	0.22
2029	No-Build Alt1	0.36	1.82	0.04	6.23	7.32	2.77	4.09	0.34	0.10
	Build Alt 2a	*0.34	*1.68	*0.03	*5.64	*7.67	*2.48	*3.78	*0.31	*0.09
	Build Alt 2b	0.39	1.94	0.04	6.61	8.64	2.90	4.37	0.37	0.11
	Build Alt 3a	*0.33	*1.64	*0.03	*5.52	*7.56	*2.42	*3.69	*0.31	*0.09
	Build Alt 3b	0.38	1.88	0.04	6.42	8.59	2.82	4.24	0.36	0.10
	Build Alt 4a	*0.33	*1.64	*0.03	*5.52	*7.56	*2.42	*3.69	*0.31	*0.09
	Build Alt 4b	0.37	1.84	0.04	6.30	8.39	2.77	4.14	0.35	0.10
	Build Alt 5a	*0.32	*1.64	*0.03	*5.53	*7.04	*2.45	*3.69	*0.30	*0.09
	Build Alt 5b	0.37	1.83	0.04	6.26	8.23	2.76	4.12	0.35	0.10
	Build Alt 6a	0.32	1.65	0.03	5.55	6.57	2.47	3.69	0.30	0.30
	Build Alt 6b	0.37	1.90	0.04	6.50	7.40	2.90	4.26	0.35	0.10
	Build Alt 7a	0.36	1.80	0.04	6.17	7.16	2.72	4.06	0.33	0.10
	Build Alt 7b	0.42	2.08	0.04	7.23	8.07	3.20	4.70	0.39	0.12
	*% Diff. between Alt 2 and No Build	-6.7	-7.6	-6.7	-9.5	4.7	-10.7	-7.5	-6.4	-7.3
	% Diff. between Alt 2 and No Build	9.2	6.5	14.5	6.0	18.0	4.7	6.9	9.5	8.4

Analysis Year/ Scenario		1,3-butadiene	Acetaldehyde	Acrolein	Benzene	Diesel PM	Ethylbenzene	Formaldehyde	Naphthalene	Polycyclic organic matter
	*% Diff. between Alt 3 and No Build	-8.8	-9.7	-8.5	-11.5	3.3	-12.6	-9.6	-8.6	-9.7
	% Diff. between Alt 3 and No Build	6.2	3.4	12.1	3.0	17.4	1.7	3.7	6.8	5.3
	*% Diff. between Alt 4 and No Build	-9.9	-9.8	-11.5	-11.5	-0.6	-12.2	-9.8	-9.7	-10.0
	% Diff. between Alt 4 and No Build	3.8	1.1	7.9	1.0	14.7	0.0	1.4	4.5	2.9
	*% Diff. between Alt 5 and No Build	-10.5	-9.5	-11.5	-11.3	-3.9	-11.6	-9.6	-10.3	-10.4
	% Diff. between Alt 5 and No Build	2.8	0.5	6.7	0.4	12.5	-0.5	0.8	3.4	2.2
	*% Diff. between Alt 6 and No Build	-11.5	-9.4	-13.3	-10.9	-10.3	-10.9	-9.7	-11.3	-10.8
	% Diff. between Alt 6 and No Build	3.6	4.3	4.8	4.2	1.1	4.4	4.2	3.7	3.5
	*% Diff. between Alt 7 and No Build	-0.1	-0.7	0.6	-1.1	-2.2	-1.7	-0.6	-0.7	0.0
	% Diff. between Alt 7 and No Build	17.1	14.7	20.6	16.0	10.2	15.3	15.0	16.4	16.4
2049	No-Build Alt1	0.26	0.95	0.03	5.45	4.58	2.64	2.24	0.22	0.06
	Build Alt 2a	*0.18	*0.68	*0.02	*3.72	*4.99	*1.78	*1.60	*0.16	*0.04
	Build Alt 2b	0.21	0.78	0.02	4.28	5.70	2.05	1.82	0.18	0.05
	Build Alt 3a	*0.17	*0.66	*0.02	*3.63	*4.84	*1.74	*1.56	*0.15	*0.04
	Build Alt 3b	0.20	0.75	0.02	4.16	5.61	1.99	1.77	0.17	0.05
	Build Alt 4a	0.17	0.65	0.02	3.60	4.69	1.73	1.54	0.15	0.04
	Build Alt 4b	0.20	0.75	0.02	4.13	5.38	1.98	1.75	0.17	0.05
	Build Alt 5a	0.17	0.65	0.02	3.59	4.55	1.73	1.53	0.15	0.04
	Build Alt 5b	0.20	0.75	0.02	4.13	5.18	1.99	1.75	0.17	0.05
	Build Alt 6a	0.20	0.77	0.02	4.32	4.10	2.09	1.80	0.18	0.05

Analysis Year/ Scenario		1,3-butadiene	Acetaldehyde	Acrolein	Benzene	Diesel PM	Ethylbenzene	Formaldehyde	Naphthalene	Polycyclic organic matter
	Build Alt 6b	0.24	0.89	0.02	5.05	4.63	2.44	2.09	0.20	0.05
	Build Alt 7a	0.19	0.72	0.02	4.04	4.55	1.94	1.70	0.17	0.04
	Build Alt 7b	0.23	0.84	0.02	4.72	5.16	2.27	1.97	0.20	0.05
	*% Diff. between Alt 2 and No Build	-29.7	-28.8	-30.5	-31.8	8.9	-32.6	-28.8	-29.5	-28.7
	% Diff. between Alt 2 and No Build	-18.3	-18.7	-18.6	-21.5	24.4	-22.5	-18.7	-18.6	-18.0
	*% Diff. between Alt 3 and No Build	-32.0	-30.5	-32.2	-33.4	5.7	-34.0	-30.6	-31.6	-30.7
	% Diff. between Alt 3 and No Build	-21.0	-21.0	-21.2	-23.6	22.5	-24.5	-21.0	-21.0	-21.1
	*% Diff. between Alt 4 and No Build	-33.0	-31.2	-33.1	-34.0	2.2	-34.5	-31.3	-32.5	-31.4
	% Diff. between Alt 4 and No Build	-22.2	-21.8	-22.0	-24.3	17.4	-25.0	-21.9	-22.3	-21.1
	*% Diff. between Alt 5 and No Build	-33.4	-31.6	-34.7	-34.2	-0.7	-34.6	-31.7	-33.1	-32.2
	% Diff. between Alt 5 and No Build	-22.8	-21.9	-23.7	-24.2	13.1	-24.7	-22.1	-22.8	-21.5
	*% Diff. between Alt 6 and No Build	-21.1	-19.5	-21.2	-20.8	-10.6	-20.9	-19.6	-20.4	-19.9
	% Diff. between Alt 6 and No Build	-6.9	-6.9	-8.5	-7.4	1.1	-7.5	-7.0	-7.0	-6.1
	*% Diff. between Alt 7 and No Build	-24.4	-24.2	-25.4	-25.9	-0.8	-26.5	-24.1	-24.0	-24.1
	% Diff. between Alt 7 and No Build	-10.9	-12.4	-12.7	-13.4	12.6	-14.1	-12.2	-11.0	-11.1

In FHWA’s view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in mobile source air toxic (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 Environmental Protection Agency (EPA) is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The 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 (IRIS), which is “a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects” (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. 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, https://www.healtheffects.org/publication/mobile-source-air-toxics-critical-reviewliterature-exposure-and-health-effects) 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, https://www.healtheffects.org/publication/mobile-source-air-toxicscritical-review-literature-exposure-and-health-effects). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The 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.” (EPA IRIS database, Diesel Engine Exhaust, Section II.C https://iris.epa.gov/static/pdfs/0642_summary.pdf).

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act 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 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 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 (https://www.cadc.uscourts.gov/internet/opinions.nsf/284E23FFE079CD5985257800005 0C9DA/$file/07-1053-1120274.pdf).

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, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

Build Alternatives 3a and 3b

Construction

Build Alternatives 3a and 3b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively; and construction effects would be similar.

Operation

Build Alternatives 3a and 3b would involve adding an HOT2+ lane in each direction. Permanent effects would be similar to Build Alternatives 2a and 2b; however, PM_{10} and $PM_{2.5}$ emissions would increase slightly under Alterative 3b and would decrease under Alterative 3a compared to the No Build Alternative 1 (Table 2.2-10 and Table 2.2-11). Therefore, the effects would be similar to effects described under Build Alternatives 2a and 2b.

Build Alternatives 4a and 4b

Construction

Build Alternatives 4a and 4b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively; and construction effects would be similar.

Operation

Build Alternatives 4a and 4b would involve adding an HOT3+ lane in each direction. Permanent effects would be similar to Build Alternatives 2a and 2b, respectively; however, PM_{10} and $PM_{2.5}$ emissions would increase slightly under Alterative 4b and would decrease under Alterative 4a compared to the No Build Alternative 1 (Table 2.2-10 and Table 2.2-11). Therefore, the effects would be similar to effects described under Build Alternatives 2a and 2b.

Build Alternatives 5a and 5b

Construction

Build Alternatives 5a and 5b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively; and construction effects would be similar.

Operation

Build Alternatives 5a and 5b would involve adding an Express Lane in each direction. Permanent effects would be similar to Build Alternatives 2a and 2b, respectively; however, PM_{10} and $PM_{2.5}$ emissions would decrease slightly compared to the No Build Alternative 1 in Design Year 2029 (Table 2.2-10 and Table 2.2-11). Therefore, the effects would be slightly less than described under Build Alternatives 2a and 2b, respectively.

Build Alternatives 6a and 6b

Construction

Build Alternatives 6a and 6b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively; and construction effects would be similar.

Operation

Build Alternatives 6a and 6b would involve adding a transit-only lane in each direction. Permanent effects would be similar to Build Alternatives 2a and 2b, respectively; however, however, PM_{10} and $PM_{2.5}$ emissions would decrease slightly compared to the No Build Alternative in Design Year 2029 (Table 2.2-10 and Table 2.2-11). Therefore, the effects would be slightly less than described under Build Alternatives 2a and 2b, respectively.

Build Alternatives 7a and 7b

Construction

Build Alternatives 7a and 7b would involve repurposing an existing general purpose lane to HOV 2+. No new lanes would be constructed. Because Build Alternatives 7a and 7b would not add new lanes but would repurpose existing lanes as managed lanes, the Build Alternatives 7a and 7b construction period may have shorter duration resulting in fewer delays than those under Build Alternatives 2a, 2b, 3a, 3b, 4a, 4b, 5a, 5b, 6a, and 6b and would result in less emissions.

Operation

As no new lanes would be constructed, Build Alternatives 7a and 7b do not increase capacity due to replacing an existing traffic lane with an HOV 2+ lane; therefore, PM_{10} and $PM_{2.5}$ emissions would decrease slightly compared to the No Build Alternative 1 in Design Year 2029 (Table 2.2-10 and Table 2.2-11). Therefore, the effects would be slightly less than described under Build Alternatives 2a and 2b, respectively.

2.2.6.4 Avoidance, Minimization, and/or Mitigation Measures

No AMMs or MMs would be required.

2.2.7 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.

2.2.8 Noise

2.2.8.1 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 4 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 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 dBA) is lower than the NAC for commercial areas (72 dBA). Table 2.2-13 lists the noise abatement criteria for use in the NEPA/23 CFR 772 analysis.

Table 2.2-13. Noise Abatement Criteria

Activity Category	NAC, Hourly A-Weighted Noise Level, Leq(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:
1. Includes undeveloped lands permitted for this activity category.

Figure 2.2-3 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.

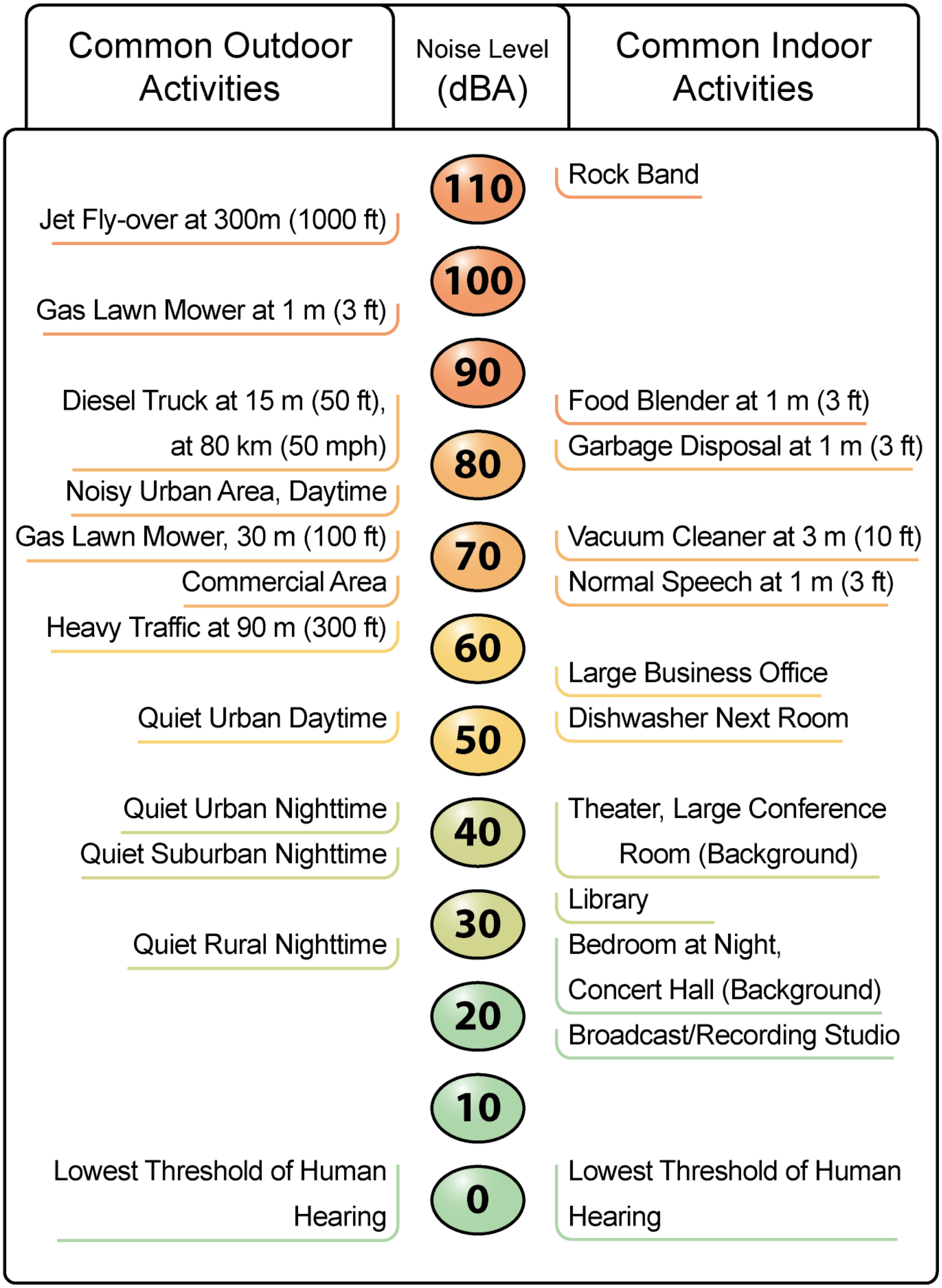


Figure 2.2-4. Noise Levels of Common Activities

According to the Caltrans *Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects, April 2020*, 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. 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.

The Caltrans *Traffic Noise Analysis Protocol* sets forth the criteria for determining when an abatement measure is reasonable and feasible. Feasibility of noise abatement is basically an engineering concern. 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).

2.2.8.2 Affected Environment

The information for the noise analysis was obtained from the Noise Study Report prepared for the project (Caltrans 2021i). The noise study encompasses all developed land uses surrounding the project limits, with a focus on noise-sensitive land uses. 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. Commercial land uses including hotels, motels, and offices are also sensitive to noise.

Receptor Categories

Noise-sensitive land uses in the vicinity of the project limits include Category B (residential), Category C (parks, trails, schools, medical facilities, and active sports areas), Category D (schools, medical facilities, and places of worship), and Category E (hotels and offices). Category F land uses (agriculture, retail facilities, utilities, and warehousing) are also present in the project vicinity.

Segment 1: Kidwell Road to east of Enterprise Boulevard

Segment 1a of the project area is surrounded by agriculture (Activity Category F), University of California Davis (Activity Category C), and single-family residential uses (Activity Category B) and does not have existing sound walls.

Segment 1b of the project area is surrounded by eight multi-family properties (Activity Category B) and three residential subdivisions (Activity Category B) with an existing 6-foot sound barrier located along the I-80 westbound off-ramp at Richards Boulevard. This sound wall is currently shielding a multi-family residential development west of a storage facility. East of the storage facility is another 6-foot sound wall shielding additional multi-family residences. Two medical facilities (Activity Category D), a hotel (Activity Category E), offices (Activity Category E), a sports facility (Activity Category C), and a school (Activity Category D) are also located within the project vicinity. There are no outdoor areas associated with the offices and medical facilities that are considered to be areas of frequent human use.

Segment 1c of the project area is surrounded by agriculture (Activity Category F), undeveloped lands that are not permitted (Activity Category F), and a wildlife trail crossing (Activity Category C).

Segment 2: East of Enterprise Boulevard to West El Camino Avenue

Segment 2 of the project area is surrounded by single-family residential (Activity Category B), a RV Park (Activity Category C), a mobile home park (Activity Category B), and a medical facility (Activity Category D). This area is generally flat. An existing 12-foot sound wall runs parallel to I-80 between the eastbound lanes and Thor Drive, shielding a mobile home park. An existing 12-foot sound wall is located adjacent to I-80 eastbound, just south of West El Camino Avenue and shields the single-family residential housing development. No outdoor areas considered to be areas of frequent human use are associated with the medical facility.

Segment 3: I-80/US-50 Separation to I-5

Segment 3a of the project area is surrounded by three residential subdivisions (Activity Category B), two multi-family properties (Activity Category B), two medical facilities (Activity Category C and D), two hotels (Activity Category E), a school (Activity Category C and D), a park (Activity Category C), and a place of worship (Activity Category D). An existing sound wall, located north of US-50 just east of the I-80/US-50 interchange, is approximately 13.5 feet tall and shields multi-family and single-family developments. Another 12-foot-tall sound wall is located south of the US-50 eastbound lanes at the off-ramp at Harbor Boulevard. This wall is shielding a Motel 6 and Radisson hotel. The Sacramento Valley Charter School, single-family housing area, Westacre Park, and Yolo High School, which are located north of the US-50 westbound lanes west of the Jefferson Boulevard interchange, are shielded by 6- to 12-foot tall sound walls. The single-family houses south of the US-50 eastbound lanes, which are also west of the Jefferson Boulevard interchange, are also currently shielded by 6- to 12-foot tall sound walls.

Segment 3b of the project area is surrounded by Parks (Category C) and residential (Activity Category B) land uses.

Noise Modeling

Short-term and long-term measurements were taken to document the existing noise environment within the project area. Accordingly, 69 short-term noise measurements were made at land uses in the project vicinity. Ten long-term noise measurements were made to quantify the trend in noise levels and establish the peak traffic noise hour. The existing loudest hour noise levels (L_{eq}[4][h]) ranged from 46 to 85 decibels (dBA) L_{eq} [h] at short-term measurement locations. The existing loudest hour noise levels ranged from 64 to 82 dBA Leq[h] at long-term locations.

In addition to the short-term and long-term measurement locations, there are 152 modeled receptor locations. Receptors are shown in Figure 2.2-5 through Figure 2.2-19.

[4] Leq represents an average of the sound energy occurring over a specified period. In effect, Leq is the steady-state sound level containing the same acoustical energy as the time-varying sound that actually occurs during the same period. The 1-hour A-weighted equivalent sound level (Leq[h]) is the energy average of A-weighted sound levels occurring during a one-hour period and is the basis for NAC used by Caltrans and FHWA.

Figure 2.2-5. Segment 1A Receptor Locations and Noise Barriers West of the Railroad Tracks

Figure 2.2-6. End of Segment 1A and Beginning of Segment 1B Receptor Locations and Noise Barriers West of Richards Boulevard

Figure 2.2-7. Segment 1B Receptor Locations and Noise Barriers West of Pole Line Road

Figure 2.2-8. Segment 1B Receptor Locations and Noise Barriers East of Pole Line Road

Figure 2.2-9. Section 1B Receptor Locations and Noise Barriers to Just East of Mace Boulevard

Figure 2.2-10. Section 1B Receptor Locations and Noise Barriers East of Mace Boulevard

Figure 2.2-11. End of Section 1B and Beginning of Section 1C Receptor Locations and Noise Barriers Just East of Levee Road

Figure 2.2-12. Beginning of Section 1C Receptor Locations West of Levee Road

Figure 2.2-13. Section 2 Receptor Locations and Noise Barriers East of Enterprise Boulevard

Figure 2.2-14. Section 3A Receptor Locations and Noise Barriers at the US-50 I-80 Interchange

Figure 2.2-15. Section 3A Receptor Locations and Noise Barriers West of Jefferson Boulevard

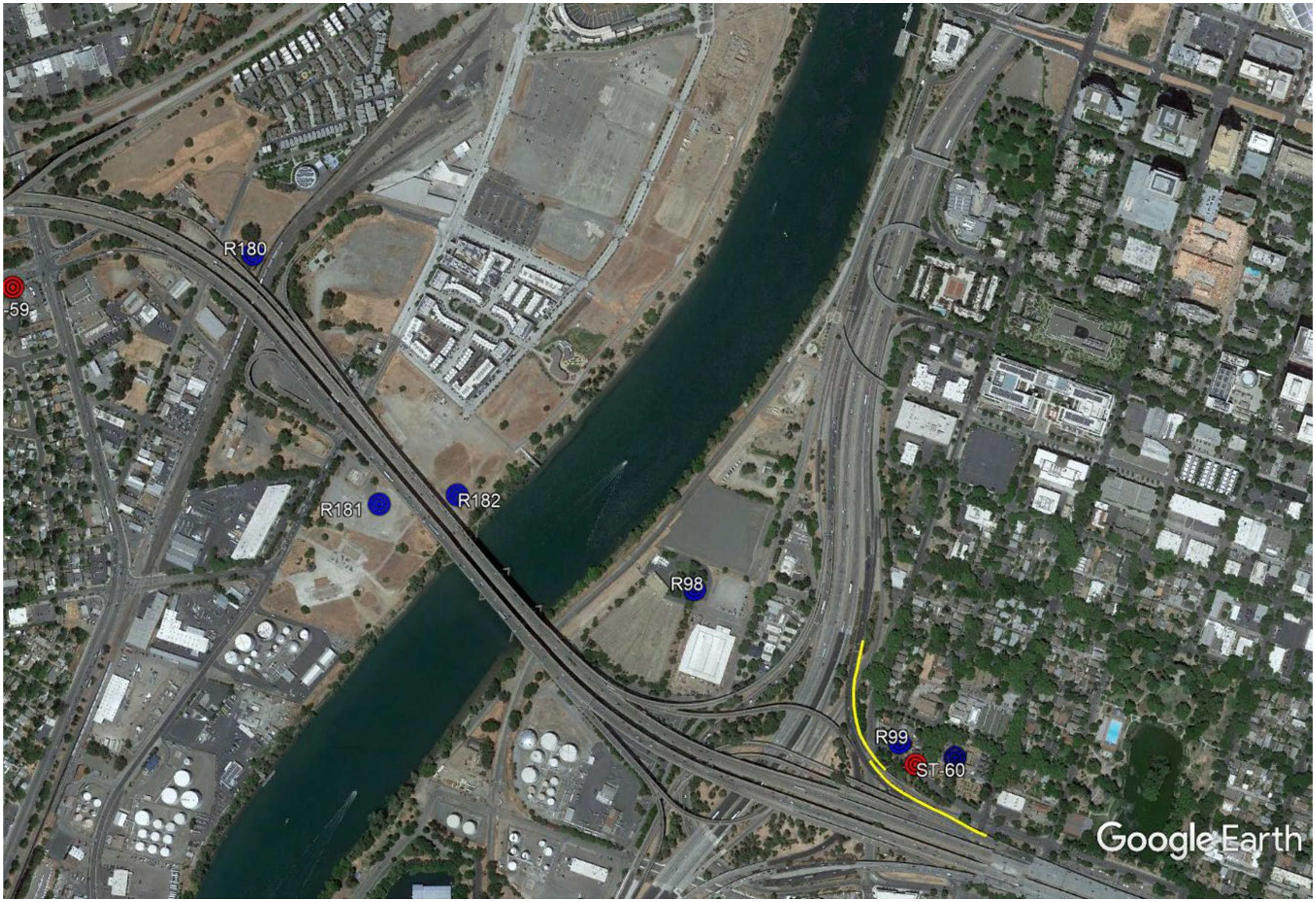


Figure 2.2-16. Section 3B Receptor Locations and Noise Barriers at the US-50 and I-5 Interchange

Figure 2.2-17. Section 2 Receptor Locations at Reed Avenue

Figure 2.2-18. Section 2 Receptor Locations and Noise Barriers North of Sacramento River

Figure 2.2-19. Section 2 Receptor Locations and Noise Barriers South of West El Camino Avenue

2.2.8.3 Environmental Consequences

The Code of Federal Regulations (23 CFR 772) "Procedures for Abatement of Highway Traffic Noise" provides procedures for preparing operational and construction noise studies and evaluating noise abatement options. Under 23 CFR 772, projects are categorized as Type I or Type II projects. Type I projects are defined as proposed federal or federal-aid highway improvements for the construction of a highway on new location; or the physical alteration of an existing highway which significantly changes either the horizontal or vertical alignment or increases the number of through-traffic lanes.

The project is a Type I project because it would involve the addition of lanes and would be eligible to receive federal funding from the Federal Highway Administration (FHWA) administered through Caltrans. Therefore, the project requires noise abatement to be considered for impacted receptors.

No Build Alternative 1

Construction

Under No Build Alternative 1, managed lanes and transportation improvements would not be constructed. As such, there would be no construction noise or vibration.

Operation

Under No Build Alternative 1, the managed lanes and transportation improvements would not be constructed; however, vehicles would continue to travel within the project area contributing to long-term noise. Noise levels are calculated to increase by up to 2 dBA by year 2049 under No Build Alternative 1 conditions. The increase is not considered substantial.

Build Alternatives 2a and 2b

Construction

Noise

Construction activities under Build Alternatives 2a and 2b would result in temporary increases to noise and vibration levels at adjacent sensitive receptors. Project construction would occur over a period of approximately 3 years and would include road cut/fill, grinding, grubbing/land cleaning, grading/excavation, drainage/utilities, and paving. Pile driving would be used for the construction of the I-80 connector structure under Build Alternative 2b. Construction noise would primarily result from the operation of heavy construction equipment and the arrival and departure of heavy-duty trucks.

Construction Table 2.2-14 summarizes the typical noise levels by construction phase and indicates that construction noise under Build Alternatives 2a and 2b would not exceed quantitative noise limits established by Caltrans except for nighttime work, which could result in an exceedance.

The construction noise levels in Table 2.2-14 are calculated for each major phase of the project at a distance of 100 feet, based on calculations conducted in FHWA's Roadway Construction Noise Model (RCNM) using project-specific construction information. This construction noise model includes representative sound levels for the most common types of construction equipment. 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 resulting 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 2.2-14. Noise Levels by Construction Phase at 100 Feet

Construction Type	Construction Phase	Maximum Noise Level (Lmax, dBA)	Hourly Average Noise Level (Leq[h], dBA)
Roadway Construction	Grubbing/Land Clearing	78	77
	Grading/Excavation	79	83
	Drainage/Utilities	79	82
	Paving	78	78
Bridge/Structures Construction	Grubbing/Land Clearing	78	77
	Grading/Excavation	79	84
	Drainage/Utilities	79	83
	Paving	75	77
Impact Pile Driving	—	95	88

Source: Caltrans 2021i

Although the overall construction schedule would occur over a period of 3 years, roadway construction activities would occur for relatively short periods of time in any specific location as construction proceeds along the project's alignment. Construction noise would mostly be of concern in areas where heavy construction would be concentrated for extended periods of time 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 through comparison of Table 2.2-14, most construction phases would generate average noise levels that would exceed ambient daytime noise levels at adjacent land uses by 15 to 20 dBA Leq[h]. 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.

Except for possible nighttime construction involving heavy equipment, construction noise levels would not be expected to exceed the quantitative noise limits established by Caltrans. AMM NOI-1 would require noise-generating construction activities to be restricted to 7:00 a.m. to 7:00 p.m. on weekdays, with no construction occurring on weekends or holidays. If work is necessary outside of these hours, a construction noise monitoring program and provide additional noise controls would be implemented.

Caltrans Standard Specifications Section 14-8.02 would require that noise levels not to exceed 86 dBA within 50 feet of the job site from the hours of 9:00 p.m. to 6:00 a.m. (Standard Measure NOI-1). Build Alternatives 2a and 2b would also implement Standard Measures NOI-2 through NOI-5 further reducing temporary construction noise levels. Therefore, temporary construction noise would have no adverse effects on nearby receptors.

Construction Vibration

Due to the short-term nature of construction, the primary concern is the potential for vibration to damage a structure. Critical factors pertaining to the impact of construction vibration on sensitive receptors include the proximity of the existing structures to the project site, soil conditions, the soundness of the structures, and the methods of construction used.

Caltrans identifies a vibration limit of 0.5 inch/second (in/sec) Peak Particle Velocity (PPV) as the threshold at which there is a potential risk of damage to new residential and modern commercial/industrial structures, 0.3 in/sec PPV for older residential structures, and a conservative limit of 0.25 in/sec PPV for historic and some old buildings (see Table 2.2-15).

Table 2.2-15. 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

Note: PPV (in/sec) = peak particle velocity (inches per second)

Construction activities with the greatest potential of generating perceptible vibration levels would include the removal of pavement and soil, the dropping of heavy objects, and the movement of heavy tracked equipment. Table 2.2-16 presents typical vibration levels that could be expected from representative construction equipment at a reference distance of 25 feet. Vibration levels are highest close to the source and then attenuate with increasing distance depending on soil conditions.

Table 2.2-16. Vibration Source Levels for Construction Equipment

Equipment	PPV at 25 feet (in/sec)	Nearest Structure Setback 10 feet[1]	Nearest Structure Setback 50 feet[1]	Nearest Structure Setback 100 feet[1]
Impact Pile Driver – Upper Range	1.158	3.173	0.540	0.252
Impact Pile Driver – Typical	0.644	1.764	0.300	0.140
Sonic Pile Driver – Upper Range	0.734	2.011	0.342	0.160
Sonic Pile Driver – Typical	0.17	0.466	0.079	0.037
Clam Shovel Drop	0.202	0.553	0.094	0.044
Hydromill (Slurry Wall) – In Soil	0.022	0.022	0.004	0.002
Hydromill (Slurry Wall) – In Rock	0.047	0.047	0.008	0.004
Vibratory Roller	0.210	0.575	0.098	0.046
Hoe Ram	0.089	0.244	0.042	0.019
Large bulldozer	0.089	0.244	0.042	0.019
Caisson drilling	0.089	0.244	0.042	0.019
Loaded trucks	0.076	0.208	0.035	0.017
Jackhammer	0.035	0.096	0.016	0.008
Small bulldozer	0.003	0.008	0.001	0.001

Source: Caltrans 2021i
Notes:
1. Representative of Setbacks of Nearest Structures (in/sec PPV). These levels are calculated assuming normal propagation conditions, using a standard equation of PPVeqmt-PPVref * (25/D) 1.1, from Caltrans, September 2013.
Key: PPV (in/sec) = peak particle velocity (inches per second)

As shown in Table 2.2-17, Caltrans recommends a vibration limit of 0.5 in/sec PPV for new residential and modern commercial/industrial structures, 0.3 in/sec PPV for older residential structures, and 0.25 in/sec PPV for historic and some old buildings. Construction vibration limits would not be exceeded during periods of construction. Therefore, temporary construction vibration would have no adverse effects on nearby receptors.

Table 2.2-17. Distance to Exceedance of Vibration Limit by Structure Type

Structure Type	Threshold	Impact Pile Driving Distance to Exceedance of Threshold (feet)[1]	Heavy Construction Distance to Exceedance of Threshold (feet) [1]
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: Caltrans 2021i
[1]These levels calculated assuming normal propagation conditions, using a standard equation of *PPVeqmt-PPVref * (25/D)* $^{1.1}$, from Caltrans, September 2013.
Key: PPV (in/sec) = peak particle velocity (inches per second)

Operation

Build Alternatives 2a and 2b would involve adding an HOV2+ lane in each direction while Build Alternative 2b would also include building an I-80 connector structure.

Modeled noise levels under Build Alternative 2a would be the same as Build Alternative 2b with the exception of areas adjacent to the proposed I-80 connector structure (Build Alternative 2b only). Build Alternative 2b, as presented in Table 2.2-18, would increase noise levels by up to 2 dBA over existing conditions and over No Build conditions under future year 2049 conditions, with one residential receptor experiencing up to a 3 dBA. These noise level increases are not considered substantial per the Caltrans Noise Analysis Protocol for New Highway Construction (Caltrans 2020a).

Under Build Alternatives 2a and 2b, traffic noise levels would approach or exceed the Noise Abatement Criteria (NAC) at Category B receptors located north of US-50 westbound travel lanes between Harbor Boulevard and Jefferson Boulevard, south of US-50 eastbound travel lanes between Harbor Boulevard and Jefferson Boulevard, east of the US-50 and I-5 interchange, east of the US-50 westbound ramp onto I-80 eastbound, to the east and west of I-80 at the Sacramento River, and to the east of I-80 eastbound between Sacramento River and West El Camino Avenue. Some of these receptors are located behind existing noise barriers.

Traffic noise levels are predicted to approach or exceed the NAC at Category C receptors located east of the US-50 westbound ramp onto I-80 eastbound and south of US-50 eastbound travel lanes between Harbor Boulevard and Jefferson Boulevard.

Accordingly, noise abatement was considered for impacted receptors as further described in Section 2.2.8.4, Avoidance, Minimization, and/or Mitigation Measures.

Table 2.2-18. Calculated Noise Levels

Receptor ID	Location	Activity Category (NAC)	Land Use	Existing Loudest $L_{eq[h]}$ (dBA)[2]	Year 2049 No Build Loudest $L_{eq[h]}$ (dBA)[2]	Alt 2A Loudest $L_{eq[h]}$ (dBA)[2]	Alt 2A Increase Over No Build (dBA)	Alt 2A Impact[1]	Alt 2b Loudest $L_{eq[h]}$ (dBA)[2]	Alt 2b Increase Over No Build (dBA)	Alt 2b Impact[1]	Alt 3a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 3a Increase Over No Build (dBA)	Alt 3a Impact[1]	Alt 4a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 4a Increase Over No Build (dBA)	Alt 4a Impact[1]	Alt 5a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 5a Increase Over No Build (dBA)	Alt 5a Impact[1]	Alt 6a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 6a Increase Over No Build (dBA)	Alt 6a Impact[1]	Alt 7a Loudest $L_{eq[h]}$ (dBA)[2]	*Alt 7a Increase Over No Build (dBA)*	Alt 7a Impact[1]
ST-1	9010 Sparling Ln	B	Residential	68	68	68	0	None[6]	68	0	None[6]	68	0	None[6]	68	0	None[6]	68	0	None[6]	68	0	None[6]	68	0	None[6]
ST-2	8991-8999 Olmo Ln	B	Residential	69	70	70	0	None[6]	70	0	None[6]	70	0	None[6]	70	0	None[6]	70	0	None[6]	70	0	None[6]	70	0	None[6]
ST-3	UC Davis SE Corner of Equestrian Center Property	C	School-Active Sports Area	66	67	67	0	None[6]	67	0	None[6]	67	0	None[6]	67	0	None[6]	67	0	None[6]	67	0	None[6]	67	0	None[6]
ST-4	UC Davis near Carolee Shields Gazebo	C	School-Arboretum	58	58	58	0	None	58	0	None	58	0	None	58	0	None	58	0	None	58	0	None	58	0	None
ST-5	9460 W Chiles Rd	B	Residential	71	72	72	0	None[6]	72	0	None[6]	72	0	None[6]	72	0	None[6]	72	0	None[6]	72	0	None[6]	72	0	None[6]
ST-6	University Inn Park and Suites Pool Area	E	Hotel	57	57	58	1	None	58	0	None	58	1	None	58	1	None	58	1	None	58	1	None	57	0	None
ST-7	1100 Chiles Nachtmann Analytical Laboratory	E	Office	71	71	72	1	None[5]	72	1	None[5]	72	1	None[5]	72	1	None[5]	72	1	None[5]	72	1	None[5]	71	0	None[5]
ST-8	UC Davis Center for Laboratory Animal Science	D	School	69	69	69	0	None[5]	69	0	None[7]	69	0	None[7]	69	0	None[5]	69	0	None[5]	69	0	None[5]	69	0	None[5]
ST-9	Cesar Chavez Plaza Apartments	B	Residential	63	63	65	2	None	64	1	None	65	2	None	65	2	None	65	2	None	65	2	None	63	0	None
ST-10	The Arbors Apartments Pool Area	B	Residential	49	49	50	1	None	50	1	None	50	1	None	50	1	None	50	1	None	50	1	None	49	0	None
ST-11	The Arbors Apartments	B	Residential	64	64	66	2	None[6]	66	2	None[6]	66	2	None[6]	66	2	None[6]	66	2	None[6]	66	2	None[6]	64	0	None[6]
ST-12	La Quinta Inn and Suites by Wyndham Davis Pool Area	E	Hotel	71	71	71	0	A/E	71	0	A/E	71	0	A/E	71	0	A/E	71	0	A/E	71	0	A/E	71	0	A/E
ST-13	Toad Hollow Dog Park	C	Park	54	54	55	1	None	55	1	None	55	1	None	55	1	None	55	1	None	55	1	None	54	0	None
ST-14	Play Fields Park	C	Active Sports Area	61	61	61	0	None	61	0	None	61	0	None	61	0	None	61	0	None	61	0	None	61	0	None
ST-15	2617 Albany Ave	B	Residential	65	65	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None

Receptor ID	Location	Activity Category (NAC)	Land Use	Existing Loudest $L_{eq[h]}$ (dBA)[2]	Year 2049 No Build Loudest $L_{eq[h]}$ (dBA)[2]	Alt 2A Loudest $L_{eq[h]}$ (dBA)[2]	Alt 2A Increase Over No Build (dBA)	Alt 2A Impact[1]	Alt 2b Loudest $L_{eq[h]}$ (dBA)[2]	Alt 2b Increase Over No Build (dBA)	Alt 2b Impact[1]	Alt 3a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 3a Increase Over No Build (dBA)	Alt 3a Impact[1]	Alt 4a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 4a Increase Over No Build (dBA)	Alt 4a Impact[1]	Alt 5a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 5a Increase Over No Build (dBA)	Alt 5a Impact[1]	Alt 6a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 6a Increase Over No Build (dBA)	Alt 6a Impact[1]	Alt 7a Loudest $L_{eq[h]}$ (dBA)[2]	*Alt 7a Increase Over No Build (dBA)*	Alt 7a Impact[1]
ST-16	2646 Albany Ave	B	Residential	52	52	52	0	None	52	0	None	52	0	None	52	0	None	52	0	None	52	0	None	52	0	None
ST-17	2813 Albany Ave	C	Playground	60	61	61	0	None	61	0	None	61	0	None	61	0	None	61	0	None	61	0	None	61	0	None
ST-18	UC Davis August A Busch III Brewing and Food Science Laboratory 641 Hilgard Ln	D	School	60	61	61	0	None[5]	61	0	None7	61	0	None[7]	61	0	None[5]	61	0	None[5]	61	0	None[5]	61	0	None[5]
ST-19	Playground at New Harmony Mutual Housing Community	C	Playground	55	55	56	1	None	55	0	None	56	1	None	56	1	None	56	1	None	56	1	None	55	0	None
ST-20	3212 Koso Terrace	B	Residential	67	67	67	0	None[6]	67	0	None6	67	0	None[6]	67	0	None[6]	67	0	None[6]	67	0	None[6]	67	0	None[6]
ST-21	3720 Chiles Rd	B	Residential	60	60	60	0	None	60	0	None	60	0	None	60	0	None	60	0	None	60	0	None	60	0	None
ST-22	3707 El Segundo Ave	B	Residential	66	66	66	0	None[6]	66	0	None6	66	0	None[6]	66	0	None[6]	66	0	None[6]	66	0	None[6]	66	0	None[6]
ST-23	Merryhill Preschool 213 La Vida Way	C	Preschool	56	56	56	0	None	56	0	None	56	0	None	56	0	None	56	0	None	56	0	None	56	0	None
ST-24	Days Inn by Wyndham Davis Near UC Davis	E	Hotel	59	59	59	0	None	59	0	None	59	0	None	59	0	None	59	0	None	59	0	None	59	0	None
ST-25	Pool Area at Motel 6 Davis–Sacramento	E	Hotel	65	65	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None
ST-26	5070 Veranda Terrace	B	Residential	46	46	47	1	None	47	1	None	47	1	None	47	1	None	47	1	None	47	1	None	46	0	None
ST-27	5093 Veranda Terrace	B	Residential	50	50	51	1	None	51	1	None	51	1	None	51	1	None	51	1	None	51	1	None	50	0	None
ST-28	Yolo Basin Foundation 45211 CR-32 B	B	Residential	60	60	60	0	None	60	0	None	60	0	None	60	0	None	60	0	None	60	0	None	60	0	None
ST-29	Davis Soccer Fields- 26375 CR-105 D	C	Active Sport Area	58	58	58	0	None	58	0	None	58	0	None	58	0	None	58	0	None	58	0	None	58	0	None
ST-30	Yolo Bypass Wildlife Area- Bike Trail	E	Trail	80	80	80	0	None[3]	80	0	None3	80	0	None[3]	80	0	None[3]	80	0	None[3]	80	0	None[3]	80	0	None[3]
ST-31	Yolo Bypass Wildlife Area	E	Trail	69	69	70	1	None[4]	70	1	None4	70	1	None[4]	70	1	None[4]	70	1	None[4]	70	1	None[4]	69	0	None[4]

Receptor ID	Location	Activity Category (NAC)	Land Use	Existing Loudest $L_{eq[h]}$ (dBA)[2]	Year 2049 No Build Loudest $L_{eq[h]}$ (dBA)[2]	Alt 2A Loudest $L_{eq[h]}$ (dBA)[2]	Alt 2A Increase Over No Build (dBA)	Alt 2A Impact[1]	Alt 2b Loudest $L_{eq[h]}$ (dBA)[2]	Alt 2b Increase Over No Build (dBA)	Alt 2b Impact[1]	Alt 3a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 3a Increase Over No Build (dBA)	Alt 3a Impact[1]	Alt 4a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 4a Increase Over No Build (dBA)	Alt 4a Impact[1]	Alt 5a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 5a Increase Over No Build (dBA)	Alt 5a Impact[1]	Alt 6a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 6a Increase Over No Build (dBA)	Alt 6a Impact[1]	Alt 7a Loudest $L_{eq[h]}$ (dBA)[2]	*Alt 7a Increase Over No Build (dBA)*	Alt 7a Impact[1]
ST-32	Roland Hensley Park- 4900 W Capitol Ave	E	Trail	65	65	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None
ST-34	Valhalla Mobile Home Club Pool Area	B	Residential	52	53	53	0	None	53	0	None	53	0	None	53	0	None	53	0	None	53	0	None	53	0	None
ST-35	10 Thor Dr	B	Residential	67	68	68	0	None[6]	68	0	None6	68	0	None[6]	68	0	None[6]	68	0	None[6]	68	0	None[6]	68	0	None[6]
ST-36	43 Bragi Dr	B	Residential	57	57	58	1	None	57	0	None	57	0	None	58	1	None	58	1	None	58	1	None	57	0	None
ST-37	241 Bragi Dr	B	Residential	61	63	63	0	None/	63	0	None/	63	0	None/	63	0	None/	63	0	None/	63	0	None/	63	0	None
ST-38	Meadowdale Park	C	Park	65	67	67	0	A/E	68	1	A/E	67	0	A/E	67	0	A/E	67	0	A/E	67	0	A/E	67	0	A/E
ST-39	3624 Palomar Ave	B	Residential	66	68	68	0	None[6]	68	0	None6	68	0	None[6]	68	0	None[6]	68	0	None[6]	68	0	None[6]	68	0	None[6]
ST-40	3604 Doran Ave	B	Residential	64	65	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None
ST-41	861 Garnet St	B	Residential	65	66	66	0	None[6]	66	0	None6	66	0	None[6]	66	0	None[6]	66	0	None[6]	66	0	None[6]	66	0	None[6]
ST-43	Center for Spiritual Awareness 1275 Starboard Dr	D	Place of Worship	65	67	67	0	None[5]	67	0	None7	67	0	None[7]	67	0	None[5]	67	0	None[5]	67	0	None[5]	67	0	None[5]
ST-44	Motel 6 West Sacramento Pool Area	E	Hotel	56	57	57	0	None	57	0	None	57	0	None	57	0	None	57	0	None	57	0	None	57	0	None
ST-45	2225 Hickory Way	B	Residential	63	65	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None
ST-46	1089 Orchard Way	B	Residential	66	67	67	0	A/E	67	0	A/E	67	0	A/E	67	0	A/E	67	0	A/E	67	0	A/E	67	0	A/E
ST-47	Westmore Oaks Elementary School 1514 Fallbrook St	C	School	73	74	74	0	None[5]	74	0	None5	74	0	None5	74	0	None[5]	74	0	None[5]	74	0	None[5]	74	0	None[5]
ST-48	Westmore Oaks Elementary School 1514 Fallbrook St	D	School	64	64	65	1	None	65	1	None7	65	1	None[7]	65	1	None	65	1	None	65	1	None	64	0	None
ST-49	1905 Buckeye Dr	B	Residential	68	70	70	0	A/E	70	0	A/E	70	0	A/E	70	0	A/E	70	0	A/E	70	0	A/E	70	0	A/E
ST-50	1412 Norfolk Ave	B	Residential	58	59	59	0	None	59	0	None	59	0	None	59	0	None	59	0	None	59	0	None	59	0	None
ST-51	Westacre Park	C	Playground	64	65	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None
ST-52	1309 Norfolk Ave	B	Residential	61	62	62	0	None	62	0	None	62	0	None	62	0	None	62	0	None	62	0	None	62	0	None
ST-53	Yolo High School 919 Westacre Rd	C	School	61	63	63	0	None	63	0	None	63	0	None	63	0	None	63	0	None	63	0	None	63	0	None

Receptor ID	Location	Activity Category (NAC)	Land Use	Existing Loudest $L_{eq[h]}$ (dBA)[2]	Year 2049 No Build Loudest $L_{eq[h]}$ (dBA)[2]	Alt 2A Loudest $L_{eq[h]}$ (dBA)[2]	Alt 2A Increase Over No Build (dBA)	Alt 2A Impact[1]	Alt 2b Loudest $L_{eq[h]}$ (dBA)[2]	Alt 2b Increase Over No Build (dBA)	Alt 2b Impact[1]	Alt 3a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 3a Increase Over No Build (dBA)	Alt 3a Impact[1]	Alt 4a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 4a Increase Over No Build (dBA)	Alt 4a Impact[1]	Alt 5a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 5a Increase Over No Build (dBA)	Alt 5a Impact[1]	Alt 6a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 6a Increase Over No Build (dBA)	Alt 6a Impact[1]	Alt 7a Loudest $L_{eq[h]}$ (dBA)[2]	*Alt 7a Increase Over No Build (dBA)*	Alt 7a Impact[1]
ST-55	719 11th St	B	Residential	61	63	63	0	None	63	0	None	63	0	None	63	0	None	63	0	None	63	0	None	63	0	None
ST-56	1011 Canna Way	B	Residential	63	65	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None
ST-58	918 Meadow Rd	B	Residential	64	66	66	0	A/E	66	0	A/E	66	0	A/E	66	0	A/E	66	0	A/E	66	0	A/E	66	0	A/E
ST-59	Food Distribution Center for Our Lady of Grace Church	E	Office	68	70	70	0	None[5]	70	0	None5	70	0	None5	70	0	None[5]	70	0	None[5]	70	0	None[5]	70	0	None[5]
ST-60	2214 4th St	B	Residential	72	72	72	0	A/E	72	0	A/E	72	0	A/E	72	0	A/E	72	0	A/E	72	0	A/E	72	0	A/E
ST-62	NW of 2197 Garden Highway	B	Residential	64	64	66	2	A/E	66	2	A/E	66	2	A/E	66	2	A/E	66	2	A/E	66	2	A/E	64	0	None
ST-63	2184 Garden Highway	B	Residential	65	65	66	1	None[5]	66	1	None5	66	1	None5	66	1	None[5]	66	1	None[5]	66	1	None[5]	65	0	None[5]
ST-64	2125 Garden Highway	B	Residential	70	70	72	2	None[6]	72	2	None6	72	2	None6	72	2	None[6]	72	2	None[6]	72	2	None[6]	70	0	None[6]
ST-65	3814 W River Dr	B	Residential	69	69	70	1	None[6]	71	2	None6	71	2	None6	71	2	None[6]	71	2	None[6]	71	2	None[6]	69	0	None[6]
ST-66	3760 W River Dr	B	Residential	59	59	60	1	None	60	1	None	60	1	None	60	1	None	60	1	None	60	1	None	59	0	None
ST-67	6 Rivulet Ct	B	Residential	61	61	63	2	None	63	2	None	63	2	None	63	2	None	63	2	None	63	2	None	61	0	None
ST-68	3638 W River Dr	B	Residential	64	64	66	2	None	66	1	None5	66	2	None5	66	2	None	66	2	None	66	2	None	64	0	None
ST-70	5 Cool Fountain Ct	B	Residential	65	65	67	2	None	67	2	None5	67	2	None5	67	2	None	670	2	None	67	2	None	65	0	None
ST-71	River Otter Park	C	Park	64	64	64	1	None	65	1	None	65	2	None	64	1	None	646	1	None	64	1	None	63	0	None
ST-72	3451 Delphinium Way	B	Residential	57	57	58	1	None	58	1	None	58	1	None	58	1	None	58	1	None	58	1	None	57	0	None
ST-73	40 White Lilly Ct	B	Residential	59	59	60	1	None	60	1	None	60	1	None	60	1	None	60	1	None	60	1	None	59	0	None
ST-74	52 Blue Fern Ct	B	Residential	61	61	62	1	None	62	1	None	62	1	None	62	1	None	62	1	None	62	1	None	61	0	None
ST-75	11 Swinging Bridge Ct	B	Residential	54	54	55	1	None	55	1	None	55	1	None	55	1	None	55	1	None	55	1	None	54	0	None
R1	1 Equestrian Ln	C	Active Sports Area	62	63	63	0	None	63	0	None	63	0	None	63	0	None	63	0	None	63	0	None	63	0	None
R4	7826 Hamel Ln	B	Residential	57	57	57	0	None	57	0	None	57	0	None	57	0	None	57	0	None	57	0	None	57	0	None
R5	UC Davis Center for Neuroscience 1544 Newton Ct	D	School	71	71	71	0	None[5]	71	0	None7	71	0	None[7]	71	0	None[5]	71	0	None[5]	71	0	None[5]	71	0	None[5]
R6	1100 Olive Dr	B	Residential	68	69	69	0	None[5]	69	0	None5	69	0	None5	69	0	None[5]	69	0	None[5]	69	0	None[5]	69	0	None[5]
R7	1100 Olive Dr	B	Residential	55	55	56	1	None	56	1	None	56	1	None	56	1	None	56	1	None	56	1	None	55	0	None
R8	1100 Olive Dr	B	Residential	59	59	60	1	None	60	1	None	60	1	None	60	1	None	60	1	None	60	1	None	59	0	None

Receptor ID	Location	Activity Category (NAC)	Land Use	Existing Loudest $L_{eq[h]}$ (dBA)[2]	Year 2049 No Build Loudest $L_{eq[h]}$ (dBA)[2]	Alt 2A Loudest $L_{eq[h]}$ (dBA)[2]	Alt 2A Increase Over No Build (dBA)	Alt 2A Impact[1]	Alt 2b Loudest $L_{eq[h]}$ (dBA)[2]	Alt 2b Increase Over No Build (dBA)	Alt 2b Impact[1]	Alt 3a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 3a Increase Over No Build (dBA)	Alt 3a Impact[1]	Alt 4a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 4a Increase Over No Build (dBA)	Alt 4a Impact[1]	Alt 5a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 5a Increase Over No Build (dBA)	Alt 5a Impact[1]	Alt 6a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 6a Increase Over No Build (dBA)	Alt 6a Impact[1]	Alt 7a Loudest $L_{eq[h]}$ (dBA)[2]	*Alt 7a Increase Over No Build (dBA)*	Alt 7a Impact[1]
R9	1200 Olive Dr	B	Residential	52	52	53	1	None	53	1	None	53	1	None	53	1	None	53	1	None	53	1	None	52	0	None
R10	1200 Olive Dr	B	Residential	59	59	61	2	None	61	2	None	61	2	None	61	2	None	61	2	None	61	2	None	59	0	None
R11	1200 Olive Dr	B	Residential	54	55	55	0	None	55	0	None	55	0	None	55	0	None	55	0	None	55	0	None	55	0	None
R12	1280 Olive Dr	B	Residential	62	63	64	1	None	64	1	None	63	0	None	64	1	None	64	1	None	64	1	None	63	0	None
R13	1414 Olive Dr	B	Residential	63	63	65	2	None	65	2	None	65	2	None	65	2	None	65	2	None	65	2	None	63	0	None
R14	1414 Olive Dr	B	Residential	63	63	65	2	None	65	2	None	65	2	None	65	2	None	65	2	None	65	2	None	63	0	None
R15	Research Park Dr	B	Residential	53	53	53	0	None	53	0	None	53	0	None	53	0	None	53	0	None	53	0	None	53	0	None
R17	1445 Drew Ave	E	Office	65	65	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None
R18	Cowell Dr	B	Residential	57	57	57	0	None	57	0	None	57	0	None	57	0	None	57	0	None	57	0	None	57	0	None
R19	Cowell Dr	B	Residential	56	56	56	0	None	56	0	None	56	0	None	56	0	None	56	0	None	56	0	None	56	0	None
R20	Cowell Dr	B	Residential	52	53	53	0	None	53	0	None	53	0	None	53	0	None	53	0	None	53	0	None	53	0	None
R21	2601 Albany Ave	B	Residential	64	64	64	0	None	64	0	None	64	0	None	64	0	None	64	0	None	64	0	None	64	0	None
R22	2611 Albany Ave	B	Residential	65	65	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None
R23	2643 Albany Ave	B	Residential	64	64	64	0	None	64	0	None	64	0	None	64	0	None	64	0	None	64	0	None	64	0	None
R24	2721 Albany Ave	B	Residential	59	59	59	0	None	59	0	None	59	0	None	59	0	None	59	0	None	59	0	None	59	0	None
R25	2745 Albany Ave	B	Residential	60	60	60	0	None	60	0	None	60	0	None	60	0	None	60	0	None	60	0	None	60	0	None
R26	2817 Albany Ave	B	Residential	61	61	61	0	None	61	0	None	61	0	None	61	0	None	61	0	None	61	0	None	61	0	None
R27	613 Benbow Ct	B	Residential	62	62	62	0	None	62	0	None	62	0	None	62	0	None	62	0	None	62	0	None	62	0	None
R28	601 Benbow Ct	B	Residential	60	60	60	0	None	60	0	None	60	0	None	60	0	None	60	0	None	60	0	None	60	0	None
R29	612 Benbow Ct	B	Residential	59	59	59	0	None	59	0	None	59	0	None	59	0	None	59	0	None	59	0	None	59	0	None
R30	University of California Agriculture and Natural Resources 2801 2nd St	D	School	71	71	71	0	None[5]	71	0	None7	71	0	None7	71	0	None[5]	71	0	None[5]	71	0	None[5]	71	0	None[5]
R31	3030 Cowell Boulevard	B	Residential	58	58	59	1	None	59	1	None	59	1	None	59	1	None	59	1	None	59	1	None	58	0	None
R32	3030 Cowell Boulevard	B	Residential	58	58	59	1	None	59	1	None	59	1	None	59	1	None	59	1	None	59	1	None	58	0	None
R33	3030 Cowell Boulevard	B	Residential	54	54	54	0	None	54	0	None	54	0	None	54	0	None	54	0	None	54	0	None	54	0	None
R34	3641 El Segundo Ave	B	Residential	65	65	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None

Receptor ID	Location	Activity Category (NAC)	Land Use	Existing Loudest $L_{eq[h]}$ (dBA)[2]	Year 2049 No Build Loudest $L_{eq[h]}$ (dBA)[2]	Alt 2A Loudest $L_{eq[h]}$ (dBA)[2]	Alt 2A Increase Over No Build (dBA)	Alt 2A Impact[1]	Alt 2b Loudest $L_{eq[h]}$ (dBA)[2]	Alt 2b Increase Over No Build (dBA)	Alt 2b Impact[1]	Alt 3a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 3a Increase Over No Build (dBA)	Alt 3a Impact[1]	Alt 4a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 4a Increase Over No Build (dBA)	Alt 4a Impact[1]	Alt 5a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 5a Increase Over No Build (dBA)	Alt 5a Impact[1]	Alt 6a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 6a Increase Over No Build (dBA)	Alt 6a Impact[1]	Alt 7a Loudest $L_{eq[h]}$ (dBA)[2]	*Alt 7a Increase Over No Build (dBA)*	Alt 7a Impact[1]
R35	3665 El Segundo Ave	B	Residential	64	64	64	0	None	64	0	None	64	0	None	64	0	None	64	0	None	64	0	None	64	0	None
R36	3714 Chiles Rd	B	Residential	59	59	59	0	None	59	0	None	59	0	None	59	0	None	59	0	None	59	0	None	59	0	None
R37	3650 El Segundo Ave	B	Residential	48	48	48	0	None	48	0	None	48	0	None	48	0	None	48	0	None	48	0	None	48	0	None
R38	3704 El Segundo Ave	B	Residential	48	48	49	1	None	48	0	None	49	1	None	49	1	None	49	1	None	49	1	None	48	0	None
R39	3730 El Segundo Ave	B	Residential	59	59	59	0	None	59	0	None	59	0	None	59	0	None	59	0	None	59	0	None	59	0	None
R40	3820 Chiles Rd	B	Residential	49	50	50	0	None	50	0	None	50	0	None	50	0	None	50	0	None	50	0	None	50	0	None
R41	3820 Chiles Rd	B	Residential	44	45	45	0	None	45	0	None	45	0	None	45	0	None	45	0	None	45	0	None	45	0	None
R42	3820 Chiles Rd	B	Residential	51	51	51	0	None	51	0	None	51	0	None	51	0	None	51	0	None	51	0	None	51	0	None
R43	3820 Chiles Rd	B	Residential	48	49	49	0	None	49	0	None	49	0	None	49	0	None	49	0	None	49	0	None	49	0	None
R44	Days Inn Wyndham Davis Nearby UC Davis	E	Hotel	47	47	47	0	None	47	0	None	47	0	None	47	0	None	47	0	None	47	0	None	47	0	None
R45	Davis Urgent Care 4515 Fermi Place	D	Medical Facility	70	70	70	0	None[5]	70	0	None7	70	0	None[7]	70	0	None[5]	70	0	None[5]	70	0	None[5]	70	0	None[5]
R46	5063 Veranda Terrace	B	Residential	52	52	52	0	None	52	0	None	52	0	None	52	0	None	52	0	None	52	0	None	52	0	None
R47	5069 Veranda Terrace	B	Residential	54	54	54	0	None	54	0	None	54	0	None	54	0	None	54	0	None	54	0	None	54	0	None
R48	5077 Veranda Terrace	B	Residential	54	54	55	1	None	55	1	None	55	1	None	54	0	None	55	1	None	55	1	None	54	0	None
R49	3951 Lake Rd	B	Residential	61	61	61	0	None	61	0	None	61	0	None	61	0	None	61	0	None	61	0	None	61	0	None
R50	3901 Lake Rd	B	Residential	62	62	62	0	None	62	0	None	62	0	None	62	0	None	62	0	None	62	0	None	62	0	None
R51	3901 Lake Rd	B	Residential	62	62	63	1	None	63	1	None	63	1	None	63	1	None	63	1	None	63	1	None	62	0	None
R52	3901 Lake Rd	B	Residential	58	58	58	0	None	58	0	None	58	0	None	58	0	None	58	0	None	58	0	None	58	0	None
R53	3901 Lake Rd	B	Residential	58	58	58	0	None	59	1	None	58	0	None	58	0	None	58	0	None	58	0	None	58	0	None
R54	3901 Lake Rd	B	Residential	61	61	62	1	None	62	1	None	62	1	None	62	1	None	62	1	None	62	1	None	61	0	None
R55	3901 Lake Rd	B	Residential	64	64	64	0	None	64	0	None	64	0	None	64	0	None	64	0	None	64	0	None	64	0	None
R56	3901 Lake Rd	B	Residential	59	59	60	1	None	60	1	None	60	1	None	60	1	None	60	1	None	60	1	None	59	0	None
R57	3901 Lake Rd	B	Residential	63	63	63	0	None	63	0	None	63	0	None	63	0	None	63	0	None	63	0	None	63	0	None

Receptor ID	Location	Activity Category (NAC)	Land Use	Existing Loudest $L_{eq[h]}$ (dBA)[2]	Year 2049 No Build Loudest $L_{eq[h]}$ (dBA)[2]	Alt 2A Loudest $L_{eq[h]}$ (dBA)[2]	Alt 2A Increase Over No Build (dBA)	Alt 2A Impact[1]	Alt 2b Loudest $L_{eq[h]}$ (dBA)[2]	Alt 2b Increase Over No Build (dBA)	Alt 2b Impact[1]	Alt 3a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 3a Increase Over No Build (dBA)	Alt 3a Impact[1]	Alt 4a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 4a Increase Over No Build (dBA)	Alt 4a Impact[1]	Alt 5a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 5a Increase Over No Build (dBA)	Alt 5a Impact[1]	Alt 6a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 6a Increase Over No Build (dBA)	Alt 6a Impact[1]	Alt 7a Loudest $L_{eq[h]}$ (dBA)[2]	*Alt 7a Increase Over No Build (dBA)*	Alt 7a Impact[1]
R58	Concentra Urgent Care 3680 Industrial Boulevard	D	Medical Facility	59	59	61	2	None[5]	61	2	None7	61	1	None[7]	61	2	None[5]	61	2	None[5]	61	2	None[5]	59	0	None[5]
R59	DaVita West 3450 Industrial Boulevard	D	Medical Facility	70	70	72	2	None[5]	72	2	None5	72	2	None[7]	72	2	None[5]	72	2	None[5]	72	2	None[5]	70	0	None[5]
R60	829 Marigold St	B	Residential	61	61	61	0	None	62	1	None	61	0	None	61	0	None	61	0	None	61	0	None	61	0	None
R61	844 Morning Glory St	B	Residential	62	62	63	1	None	64	2	None	63	1	None	63	1	None	63	1	None	63	1	None	62	0	None
R62	832 Garnet St	B	Residential	61	61	62	1	None	63	2	None	62	1	None	62	1	None	62	1	None	62	1	None	61	0	None
R63	3524 Doran Ave	B	Residential	60	60	61	1	None	62	2	None	61	1	None	61	1	None	61	1	None	61	1	None	60	0	None
R64	857 Garnet St	B	Residential	57	57	58	1	None	58	1	None	58	1	None	58	1	None	58	1	None	58	1	None	57	0	None
R65	3427 Evergreen Circle	B	Residential	64	64	66	2	None	66	2	A/E	66	2	A/E	66	2	None	66	2	None	66	2	None	64	0	None
R66	3427 Evergreen Circle	B	Residential	55	55	56	1	None	56	1	None	56	1	None	56	1	None	56	1	None	56	1	None	55	0	None
R67	Ramada by Wyndham West Sacramento Hotel & Suites	E	Hotel	55	55	57	2	None	57	2	None	57	2	None	57	2	None	57	2	None	57	2	None	55	0	None
R68	Sacramento Valley Charter School 2399 Sellers Way	D	School	66	66	68	2	None[5]	68	2	None7	68	2	None[7]	68	2	None[5]	68	2	None[5]	68	2	None[5]	66	0	None[5]
R69	River Bend Nursing Center 2215 Oakmont Way	C	Medical Facility	61	61	62	1	None	62	1	None	62	1	None	62	1	None	62	1	None	62	1	None	61	0	None
R70	2205 Hickory Way	B	Residential	68	68	70	2	A/E	70	2	A/E	70	2	A/E	70	2	A/E	70	2	A/E	70	2	A/E	68	0	A/E
R71	2143 Hickory Way	B	Residential	69	69	70	1	A/E	70	1	A/E	70	1	A/E	70	1	A/E	70	1	A/E	70	1	A/E	69	0	A/E
R72	2105 Hickory Way	B	Residential	65	65	67	2	None	67	2	None5	67	2	None5	67	2	None	67	2	None	67	2	None	65	0	None
R73	1049 Orchard Way	B	Residential	64	64	66	2	None	66	2	None5	66	2	None5	66	2	None	66	2	None	66	2	None	64	0	None
R74	959 Orchard Way	B	Residential	62	62	63	1	None	63	1	None	63	1	None	63	1	None	63	1	None	63	1	None	62	0	None
R75	2019 Buckeye Dr	B	Residential	67	67	69	2	A/E	69	2	A/E	69	2	A/E	69	2	A/E	69	2	A/E	69	2	A/E	67	0	A/E

Receptor ID	Location	Activity Category (NAC)	Land Use	Existing Loudest $L_{eq[h]}$ (dBA)[2]	Year 2049 No Build Loudest $L_{eq[h]}$ (dBA)[2]	Alt 2A Loudest $L_{eq[h]}$ (dBA)[2]	Alt 2A Increase Over No Build (dBA)	Alt 2A Impact[1]	Alt 2b Loudest $L_{eq[h]}$ (dBA)[2]	Alt 2b Increase Over No Build (dBA)	Alt 2b Impact[1]	Alt 3a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 3a Increase Over No Build (dBA)	Alt 3a Impact[1]	Alt 4a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 4a Increase Over No Build (dBA)	Alt 4a Impact[1]	Alt 5a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 5a Increase Over No Build (dBA)	Alt 5a Impact[1]	Alt 6a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 6a Increase Over No Build (dBA)	Alt 6a Impact[1]	Alt 7a Loudest $L_{eq[h]}$ (dBA)[2]	*Alt 7a Increase Over No Build (dBA)*	Alt 7a Impact[1]
R76	1020 Sycamore Ave	B	Residential	58	58	59	1	None	59	1	None	59	1	None	59	1	None	59	1	None	59	1	None	58	0	None
R77	1009 Sycamore Ave	B	Residential	57	57	59	2	None	59	2	None	59	2	None	59	2	None	59	2	None	59	2	None	57	0	None
R78	1021 Hemlock St	B	Residential	59	59	60	1	None	60	1	None	60	1	None	60	1	None	60	1	None	60	1	None	59	0	None
R79	1933 Buckeye Dr	B	Residential	66	66	68	2	A/E	68	2	A/E	68	2	A/E	68	2	A/E	68	2	A/E	68	2	A/E	66	0	A/E
R80	1913 Buckeye Dr	B	Residential	66	66	68	2	A/E	68	2	A/E	68	2	A/E	68	2	A/E	68	2	A/E	68	2	A/E	66	0	A/E
R81	1012 Poplar Ave	B	Residential	58	58	60	2	None	60	2	None	60	2	None	60	2	None	60	2	None	60	2	None	58	0	None
R82	1608 Norfolk Ave	B	Residential	69	69	71	2	A/E	71	2	A/E	71	2	A/E	71	2	A/E	71	2	A/E	71	2	A/E	69	0	A/E
R83	1504 Norfolk Ave	B	Residential	68	68	70	2	A/E	70	2	A/E	70	2	A/E	70	2	A/E	70	2	A/E	70	2	A/E	68	0	A/E
R84	1404 Norfolk Ave	B	Residential	69	69	71	2	A/E	71	2	A/E	71	2	A/E	71	2	A/E	71	2	A/E	71	2	A/E	69	0	A/E
R85	1204 Norfolk Ave	B	Residential	70	70	72	2	A/E	72	2	A/E	72	2	A/E	72	2	A/E	72	2	A/E	72	2	A/E	70	0	A/E
R86	1604 Meadow Rd	B	Residential	58	58	60	2	None	60	2	None	60	2	None	60	2	None	60	2	None	60	2	None	58	0	None
R87	1601 Norfolk Ave	B	Residential	59	59	60	1	None	60	1	None	60	1	None	60	1	None	60	1	None	60	1	None	59	0	None
R88	1024 Haverhill St	B	Residential	60	60	62	2	None	62	2	None	62	2	None	62	2	None	62	2	None	62	2	None	60	0	None
R89	1305 Norfolk Ave	B	Residential	60	60	62	2	None	62	2	None	62	2	None	62	2	None	62	2	None	62	2	None	60	0	None
R90	1104 Westacre Rd	B	Residential	60	60	62	2	None	62	2	None	62	2	None	62	2	None	62	2	None	62	2	None	60	0	None
R91	1101 Westacre Rd	B	Residential	62	62	64	2	None	64	2	None	64	2	None	64	2	None	64	2	None	64	2	None	62	0	None
R92	727 11th St	B	Residential	69	69	71	2	A/E	71	2	A/E	71	2	A/E	71	2	A/E	71	2	A/E	71	2	A/E	69	0	A/E
R93	715 Webster St	B	Residential	64	64	66	2	None	66	2	A/E	66	2	A/E	66	2	None	66	2	None	66	2	None	64	0	None
R94	1020 Meadow Rd	B	Residential	62	62	64	2	None	64	2	None	64	2	None	64	2	None	64	2	None	64	2	None	62	0	None
R95	609 Webster St	B	Residential	62	62	64	2	None	64	2	None	64	2	None	64	2	None	65	3	None	65	3	None	62	0	None
R96	504 Webster St	B	Residential	64	64	66	2	A/E	66	2	A/E	66	2	A/E	66	2	A/E	66	2	A/E	66	2	A/E	64	0	None
R97	911 Meadow Rd	B	Residential	65	65	67	2	A/E	67	2	A/E	67	2	A/E	67	2	A/E	67	2	A/E	67	2	A/E	65	0	None
R98	Levia Park	C	Park	65	65	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None
R99	316 V St	B	Residential	72	72	72	0	A/E	72	0	A/E	72	0	A/E	72	0	A/E	72	0	A/E	72	0	A/E	72	0	A/E
R100	2209 4th St	B	Residential	65	65	65	0	A/E	65	0	None	65	0	None	65	0	A/E	65	0	A/E	65	0	A/E	65	0	None
R101	846 Marigold St	B	Residential	63	63	65	2	None	66	3	A/E	65	2	None	65	2	None	65	2	None	65	2	None	63	0	None
R102	828 Marigold St	B	Residential	64	64	65	1	None	65	1	None	65	1	None	65	1	None	65	1	None	65	1	None	64	0	None

Receptor ID	Location	Activity Category (NAC)	Land Use	Existing Loudest $L_{eq[h]}$ (dBA)[2]	Year 2049 No Build Loudest $L_{eq[h]}$ (dBA)[2]	Alt 2A Loudest $L_{eq[h]}$ (dBA)[2]	Alt 2A Increase Over No Build (dBA)	Alt 2A Impact[1]	Alt 2b Loudest $L_{eq[h]}$ (dBA)[2]	Alt 2b Increase Over No Build (dBA)	Alt 2b Impact[1]	Alt 3a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 3a Increase Over No Build (dBA)	Alt 3a Impact[1]	Alt 4a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 4a Increase Over No Build (dBA)	Alt 4a Impact[1]	Alt 5a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 5a Increase Over No Build (dBA)	Alt 5a Impact[1]	Alt 6a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 6a Increase Over No Build (dBA)	Alt 6a Impact[1]	Alt 7a Loudest $L_{eq[h]}$ (dBA)[2]	*Alt 7a Increase Over No Build (dBA)*	Alt 7a Impact[1]
R103	812 Morning Glory St	B	Residential	60	60	61	1	None	62	2	None	61	1	None	61	1	None	61	1	None	61	1	None	60	0	None
R104	3600 Palomar Ave	B	Residential	64	64	64	0	None	65	1	None	64	0	None	64	0	None	64	0	None	64	0	None	64	0	None
R105	3624 Palomar Ave	B	Residential	67	67	69	2	A/E	69	2	A/E	69	2	A/E	68	1	A/E	68	1	A/E	69	2	A/E	67	0	A/E
R106	2125 Garden Highway	B	Residential	69	69	71	2	A/E	71	2	A/E	71	2	A/E	71	2	A/E	71	2	A/E	71	2	A/E	69	0	A/E
R107	2145 Garden Highway	B	Residential	68	68	70	2	A/E	70	2	A/E	70	2	A/E	70	2	A/E	70	2	A/E	70	2	A/E	68	0	A/E
R108	2181 Garden Highway	B	Residential	65	65	66	1	A/E	66	1	A/E	66	1	A/E	66	1	A/E	66	1	A/E	66	1	A/E	65	0	None
R109	2197 Garden Highway	B	Residential	65	65	67	2	A/E	66	1	A/E	67	2	A/E	67	2	A/E	67	2	A/E	67	2	A/E	65	0	None
R110	2184 Garden Highway	B	Residential	64	64	66	2	None	66	2	A/E	66	2	A/E	66	2	None	66	2	None	66	2	None	64	0	None
R111	3796 W River Dr	B	Residential	64	64	65	1	None	66	2	A/E	66	2	A/E	65	1	None	65	1	None	66	2	None	64	0	None
R112	3778 W River Dr	B	Residential	60	60	62	2	None	62	2	None	62	2	None	62	2	None	62	2	None	62	2	None	60	0	None
R113	3575 Wheelhouse Ave	B	Residential	65	65	67	2	None	67	2	A/E	67	2	A/E	67	2	None	67	2	None	67	2	None	65	0	None
R114	2106 Sternwheeler Way	B	Residential	60	60	62	2	None	62	2	None	62	2	None	62	2	None	62	2	None	62	2	None	60	0	None
R115	3742 W River Dr	B	Residential	57	57	59	2	None	59	2	None	59	2	None	59	2	None	59	2	None	59	2	None	57	0	None
R116	3724 W River Dr	B	Residential	60	60	62	2	None	62	2	None	62	2	None	62	2	None	62	2	None	62	2	None	60	0	None
R117	21116 Smokestack Way	B	Residential	60	60	61	1	None	61	1	None	61	1	None	61	1	None	61	1	None	61	1	None	60	0	None
R118	3542 Delta Queen Ave	B	Residential	60	60	61	1	None	61	1	None	61	1	None	61	1	None	61	1	None	61	1	None	60	0	None
R119	3517 Delta Queen Ave	B	Residential	62	62	64	2	None	64	2	None	64	2	None	64	2	None	64	2	None	64	2	None	62	0	None
R120	3682 W River Dr	B	Residential	61	61	62	1	None	62	1	None	62	1	None	62	1	None	62	1	None	62	1	None	61	0	None
R121	3494 Delta Queen Ave	B	Residential	54	54	55	1	None	55	1	None	55	1	None	55	1	None	55	1	None	55	1	None	54	0	None
R122	3481 Delta Queen Ave	B	Residential	60	60	62	2	None	62	2	None	62	2	None	62	2	None	62	2	None	62	2	None	60	0	None
R123	3441 River Shoal Ave	B	Residential	55	55	57	2	None	57	2	None	57	2	None	57	2	None	57	2	None	57	2	None	55	0	None

Receptor ID	Location	Activity Category (NAC)	Land Use	Existing Loudest $L_{eq(h)}$ (dBA)[2]	Year 2049 No Build Loudest $L_{eq(h)}$ (dBA)[2]	Alt 2A Loudest $L_{eq(h)}$ (dBA)[2]	Alt 2A Increase Over No Build (dBA)	Alt 2A Impact[1]	Alt 2b Loudest $L_{eq(h)}$ (dBA)[2]	Alt 2b Increase Over No Build (dBA)	Alt 2b Impact[1]	Alt 3a Loudest $L_{eq(h)}$ (dBA)[2]	Alt 3a Increase Over No Build (dBA)	Alt 3a Impact[1]	Alt 4a Loudest $L_{eq(h)}$ (dBA)[2]	Alt 4a Increase Over No Build (dBA)	Alt 4a Impact[1]	Alt 5a Loudest $L_{eq(h)}$ (dBA)[2]	Alt 5a Increase Over No Build (dBA)	Alt 5a Impact[1]	Alt 6a Loudest $L_{eq(h)}$ (dBA)[2]	Alt 6a Increase Over No Build (dBA)	Alt 6a Impact[1]	Alt 7a Loudest $L_{eq(h)}$ (dBA)[2]	*Alt 7a Increase Over No Build (dBA)*	Alt 7a Impact[1]
R124	3451 Delta Queen Ave	B	Residential	58	58	60	2	None	60	2	None	60	2	None	60	2	None	60	2	None	60	2	None	58	0	None
R125	3633 W River Dr	B	Residential	65	65	67	2	None	67	2	A/E	67	2	A/E	67	2	None	67	2	None	67	2	None	65	0	None
R126	2215 Shady Arbor Dr	B	Residential	64	64	66	2	None	66	2	A/E	66	2	A/E	66	2	None	66	2	None	66	2	None	64	0	None
R127	2171 Shady Arbor Dr	B	Residential	58	58	59	1	None	59	1	None	59	1	None	59	1	None	59	1	None	59	1	None	58	0	None
R128	3569 W River Dr	B	Residential	58	58	60	2	None	60	2	None	60	2	None	60	2	None	60	2	None	60	2	None	58	0	None
R129	3527 W River Dr	B	Residential	54	54	56	2	None	56	2	None	56	2	None	56	2	None	56	2	None	56	2	None	54	0	None
R130	5 Cool Fountain Ct	B	Residential	63	63	64	1	None	64	1	None	64	1	None	64	1	None	64	1	None	64	1	None	63	0	None
R131	3447 Sweet Pea Way	B	Residential	57	57	58	1	None	58	1	None	58	1	None	58	1	None	58	1	None	58	1	None	57	0	None
R132	3439 W River Dr	B	Residential	52	52	54	2	None	54	2	None	54	2	None	54	2	None	54	2	None	54	2	None	52	0	None
R133	3407 W River Dr	B	Residential	51	51	52	1	None	52	1	None	52	1	None	52	1	None	52	1	None	52	1	None	51	0	None
R134	40 Shady Arbor Ct	B	Residential	59	59	60	1	None	60	1	None	60	1	None	60	1	None	60	1	None	60	1	None	59	0	None
R135	22 Calla Lily Ct	B	Residential	53	53	54	1	None	54	1	None	54	1	None	54	1	None	54	1	None	54	1	None	53	0	None
R136	2318 Barandas Dr	B	Residential	55	55	56	1	None	56	1	None	56	1	None	56	1	None	56	1	None	56	1	None	55	0	None
R137	3428 Delphinium Way	B	Residential	53	53	54	1	None	54	1	None	54	1	None	54	1	None	54	1	None	54	1	None	53	0	None
R138	27 White Lily Ct	B	Residential	54	54	55	1	None	55	1	None	55	1	None	55	1	None	55	1	None	55	1	None	54	0	None
R139	40 White Lily Ct	B	Residential	59	59	61	2	None	61	2	None	61	2	None	61	2	None	61	2	None	61	2	None	59	0	None
R140	3235 Spinning Rod Way	B	Residential	53	53	54	1	None	54	1	None	54	1	None	54	1	None	54	1	None	54	1	None	53	0	None
R141	27 Blue Fern Ct	B	Residential	65	65	66	1	A/E	66	1	A/E	66	1	A/E	66	1	A/E	66	1	A/E	66	1	A/E	65	0	None
R142	3259 Spinning Rod Way	B	Residential	54	54	55	1	None	55	1	None	55	1	None	55	1	None	55	1	None	55	1	None	54	0	None
R143	3175 Boathouse Way	B	Residential	51	51	52	1	None	52	1	None	52	1	None	52	1	None	52	1	None	52	1	None	51	0	None
R144	18 Spinning Rod Ct	B	Residential	61	61	63	2	None	63	2	None	63	2	None	63	2	None	63	2	None	63	2	None	61	0	None
R145	Olive Dr	B	Residential	64	64	65	1	None	65	1	None	65	1	None	65	1	None	65	1	None	65	1	None	64	0	None
R146	Olive Dr	B	Residential	64	64	65	1	None	65	1	None	65	1	None	65	1	None	65	1	None	65	1	None	64	0	None
R147	Olive Dr	B	Residential	62	63	63	1	None	63	0	None	63	0	None	63	1	None	63	0	None	63	0	None	63	0	None

Receptor ID	Location	Activity Category (NAC)	Land Use	Existing Loudest $L_{eq[h]}$ (dBA)[2]	Year 2049 No Build Loudest $L_{eq[h]}$ (dBA)[2]	Alt 2A Loudest $L_{eq[h]}$ (dBA)[2]	Alt 2A Increase Over No Build (dBA)	Alt 2A Impact[1]	Alt 2b Loudest $L_{eq[h]}$ (dBA)[2]	Alt 2b Increase Over No Build (dBA)	Alt 2b Impact[1]	Alt 3a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 3a Increase Over No Build (dBA)	Alt 3a Impact[1]	Alt 4a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 4a Increase Over No Build (dBA)	Alt 4a Impact[1]	Alt 5a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 5a Increase Over No Build (dBA)	Alt 5a Impact[1]	Alt 6a Loudest $L_{eq[h]}$ (dBA)[2]	Alt 6a Increase Over No Build (dBA)	Alt 6a Impact[1]	Alt 7a Loudest $L_{eq[h]}$ (dBA)[2]	*Alt 7a Increase Over No Build (dBA)*	Alt 7a Impact[1]
R148	9010 Sparling Ln	B	Residential	56	57	57	1	None	57	0	None	57	0	None	57	1	None	57	0	None	57	0	None	57	0	None
R149	8991-8999 Olmo Ln	B	Residential	63	63	64	1	None	63	0	None	63	0	None	64	1	None	64	1	None	63	0	None	63	0	None
R150	9460 W Chiles Rd	B	Residential	71	71	72	1	A/E	72	1	A/E	72	1	A/E	72	1	A/E	72	1	A/E	72	1	A/E	71	0	A/E
R151	Westmore Oaks Elementary School	C	School	70	70	70	0	A/E	70	0	A/E	70	0	A/E	70	0	A/E	70	0	A/E	70	0	A/E	70	0	A/E
R152	3620 Palomar Ave	B	Residential	66	66	66	0	A/E	67	1	A/E	66	0	A/E	66	0	A/E	66	0	A/E	66	0	A/E	66	0	A/E
R153	3612 Palomar Ave	B	Residential	65	65	65	0	None	66	1	A/E	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None
R154	812 Marigold St	B	Residential	65	65	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None	65	0	None
R155	820 Marigold St	B	Residential	65	65	66	1	A/E	67	2	A/E	66	1	A/E	66	1	A/E	66	1	A/E	66	1	A/E	65	0	None

Source: Caltrans 2021i
[1] Impact Type: S = Substantial Increase (12 dBA or more), A/E = Approach or Exceed NAC, None = Increase is less than 12 decibels and noise levels do not approach or exceed the NAC.
[2] As stated in the TeNS, modeling results are rounded to the nearest decibel before comparisons are made.
[3] As stated in the Traffic Noise Protocol (TNAP) April 2020, bike baths that serve primarily as a transportation facility are not evaluated as recreational trails.
[4] As stated in the Traffic Noise Protocol (TNAP) April 2020, recreational trails that primarily involve the use of motorized vehicles are not evaluated as recreational
[5] This location does not include any exterior noise sensitive land uses; exterior noise levels are provided for reference only.
[6]This location is not considered an area of frequent human use where people are exposed to traffic for an extended period of time on a regular basis. Where applicable, additional receivers have been placed in areas of frequent human use.
[7] This location does not include any exterior noise sensitive land uses, so would be considered a Category D land use only. Exterior noise levels are presented in the Table.
Notes: $L_{eq[h]}$ = The 1-hour A-weighted equivalent sound level; dBA = A-weighted decibels

Interior Noise

A noise impact would occur if, as a result of a proposed freeway project, noise levels approach or exceed 52 dBA Leq[h] in the interior of 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. Based on FHWA Guidance, a typical Category D use structure would be anticipated to provide about 10 dBA of noise reduction from exterior noise sources with windows open, and 20 to 30 dBA of noise reduction with windows in the closed position, depending on the window and exterior wall construction. Category D use structures that do not have forced-air mechanical ventilation to allow occupants to keep windows closed to control noise could be anticipated to have interior noise levels approaching or exceeding 52 dBA Leq[h] with exterior exposures of 62 dBA Leq[h] or more. For structures with windows in the closed position, exterior noise levels of 72 to 82 dBA Leq[h] or less, depending on the acoustical construction of the structure, would result in acceptable interior noise levels.

Under Build Alternative 2a and 2b, noise levels at the worst-case exterior façades of Category D land uses that are identified along the alignment range from 56 to 72 dBA Leq[h] by year 2049. Table 2.2-19 lists the calculated loudest-hour interior noise levels within the three Category D land uses.

Four medical facilities were identified in the project area. Davis Urgent Care is located approximately 320 feet north of I-80 and is represented by Receptor R45 (Figure 2.2-8). The 4515 Fermi Place building, of which Davis Urgent Care is an occupant, is a large office building of modern construction and is anticipated to provide about 30 dB of exterior-to-interior noise reduction with windows closed. Concentra Urgent Care is located approximately 350 feet south of I-80 and is represented by Receptor R58 (Figure 2.2-11). The 3680 Industrial Boulevard building, of which Concentra Urgent Care is an occupant, is a large office building of modern construction and is anticipated to provide about 30 dB of exterior-to-interior noise reduction with windows closed. DaVita West Sacramento Dialysis Center is located approximately 280 feet south of US-50 and is represented by Receptor R59 (Figure 2.2-12). The 3450 Industrial Boulevard building, of which DaVita West Sacramento Dialysis Center is an occupant, is a large office building of modern construction and is anticipated to provide about 30 dB of exterior-to-interior noise reduction with windows closed. Noise levels within the 3450 Industrial Boulevard building are not anticipated to approach or exceed 52 dBA Leq[h]. River Bend Nursing Center is located approximately 180 feet north of US-50 and is represented by Receptor R69 (Figure 2.2-13). The 2215 Oakmont Way building, of which River Bend Nursing Center is an occupant, is a large office building of modern construction and is anticipated to provide about 30 dB of exterior-to-interior noise reduction with windows closed. All four office buildings include mechanical ventilation, allowing occupants the option of closing windows to control noise. Therefore, noise levels at all four buildings are not anticipated to approach or exceed 52 dBA Leq.

Table 2.2-19. Calculated Interior Noise Levels for No Build Alternative 1 and Build Alternatives 2a and 2b

Receptor ID	Loudest-Hour Exterior Noise Levels, $Leq_{[h]}$ dBA[2]			Calculated Interior Noise Level	Land Use	Impact
	Existing	2049 No Build (Alt 1)	2049 Build (Alts 2a/2b)	2049 Build (Alts 2a/2b)		
ST-8	69	69	69	39	School	None
ST-18	60	61	61	31	School	None
ST-23	56	56	56	26	Preschool	None
ST-43	65	67	67	37	Place of Worship	None
ST-48	64	64	65	35	School	None
ST-53	61	63	63	33	School	None
R5	71	71	71	41	School	None
R30	71	71	71	41	School	None
R45	70	70	70	40	Medical Facility	None
R58	59	59	61	31	Medical Facility	None
R59	70	70	72	42	Medical Facility	None
R68	66	66	68	38	School	None
R69	61	61	62	32	Medical Facility	None

Two colleges were identified in the project area. University of California Davis (UC Davis) has multiple building locations throughout the project area. The UC Davis Center of Laboratory Animal Science is located approximately 290 feet south of I-80 and is represented by Receptor ST-8 (). The laboratory building is a large office building of modern construction and is anticipated to provide about 30 dB of exterior-to-interior noise reduction with windows closed. Based on a desktop review, the laboratory building includes mechanical ventilation, allowing occupants the option of closing windows to control noise. Noise levels within the UC Davis Center for Laboratory Animal Science building are not anticipated to approach or exceed 52 dBA Leq[h]. The UC Davis August A. Busch III Brewing and Food Science Laboratory is located approximately 450 feet north of I-80 and is represented by Receptor ST-18 (). The 641 Hilgard Lane building, of which The UC Davis August A. Busch III Brewing and Food Science Laboratory is an occupant, is a large office building of modern construction and is anticipated to provide about 30 dB of exterior-to-interior noise reduction with windows closed. Based on a desktop review, the 641 Hilgard Lane building includes mechanical ventilation, allowing occupants the option of closing windows to control noise. Noise levels within the 641 Hilgard Lane building are not anticipated to approach or exceed 52 dBA Leq[h]. The UC Davis Center for Neuroscience is located approximately 250 feet east of I-80 and is represented by Receptor R5 (Figure 2.2-5). The 1544 Newton Court building, of which the UC Davis Center for

Neuroscience is an occupant, is a large office building of modern construction and is anticipated to provide about 30 dB of exterior-to-interior noise reduction with windows closed. Based on a desktop review, the 1544 Newton Court building includes mechanical ventilation, allowing occupants the option of closing windows to control noise. Noise levels within the 1544 Newton Court building are not anticipated to approach or exceed 52 dBA Leq[h]. The University of California Agriculture and Natural Resources is located approximately 300 feet north of I-80 and is represented by Receptor R30 (Figure 2.2-7). The 2801 2nd Street building, of which the University of California Agriculture and Natural Resources is an occupant, is a large office building of modern construction and is anticipated to provide about 30 dB of exterior-to-interior noise reduction with windows closed. Based on a desktop review, the 2801 2nd Street building includes mechanical ventilation, allowing occupants the option of closing windows to control noise. Noise levels within the 2801 2nd Street building are not anticipated to approach or exceed 52 dBA Leq[h].

Four schools were identified in the project area. Merryhill Preschool is located approximately 320 feet south of I-80 and is represented by Receptor ST-23 (Figure 2.2-8). The 222 La Vida Way building, of which Merryhill Preschool is an occupant, is a medium building of modern construction and is anticipated to provide about 30 dB of exterior-to-interior noise reduction with windows closed. Based on a desktop review, the 222 La Vida Way building includes mechanical ventilation, allowing occupants the option of closing windows to control noise. Noise levels within the 222 La Vida Way building are not anticipated to approach or exceed 52 dBA Leq[h]. Westmore Oaks Elementary School is located approximately 400 feet south of US-50 and is represented by Receptor ST-48 (Figure 2.2-13). The 1514 Fallbrook Street building, of which Westmore Oaks Elementary School is an occupant, is a large building of modern construction and is anticipated to provide about 30 dB of exterior-to-interior noise reduction with windows closed. Based on a desktop review, the 1514 Fallbrook Street building includes mechanical ventilation, allowing occupants the option of closing windows to control noise. Noise levels within the 1514 Fallbrook Street building are not anticipated to approach or exceed 52 dBA Leq[h]. Yolo High School is located approximately 340 feet north of US-50 and is represented by Receptor ST-53 (Figure 2.2-13). The 919 Westacre Road building, of which Yolo High School is an occupant, is a large building of modern construction and is anticipated to provide about 30 dB of exterior-to-interior noise reduction with windows closed. Based on a desktop review, the 919 Westacre Road building includes mechanical ventilation, allowing occupants the option of closing windows to control noise. Noise levels within the 919 Westacre Road building are not anticipated to approach or exceed 52 dBA Leq[h]. Sacramento Valley Charter School is located approximately 125 feet north of US-50 and is represented by Receptor R68 (Figure 2.2-13). The 2399 Sellers Way building, of which Sacramento Valley Charter School is an occupant, is a large building of modern construction and is anticipated to provide about 30 dB of exterior-to-interior noise reduction with windows closed. Based on a desktop review, the 2399 Sellers Way building includes mechanical ventilation, allowing occupants the option of closing windows to control noise. Noise levels within the 2399 Sellers Way building are not anticipated to approach or exceed 52 dBA Leq[h].

One place of worship was identified in the project area. The Center for Spiritual Awareness is located approximately 128 feet south of US-50 and is represented by Receptor ST-43 (Figure 2.2-12). The 1275 Starboard Drive building, of which the Center for Spiritual Awareness is an occupant, is a large building of modern construction and is anticipated to provide about 30 dB of exterior-to-interior noise reduction with windows closed. Based on a desktop review, the 1275 Starboard Drive building includes mechanical ventilation, allowing occupants the option of closing windows to control noise. Noise levels within the 1275 Starboard Drive building are not anticipated to approach or exceed 52 dBA Leq[h].

Therefore, no adverse effect would occur related to interior noise levels.

Build Alternatives 3a and 3b

Construction

Build Alternatives 3a and 3b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effect would be the same as effects described under Build Alternatives 2a and 2b, respectively.

Operation

Build Alternatives 3a and 3b would involve adding an HOT 2+ lane in each direction. Build Alternative 3b would also include building an I-80 connector structure. The 2049 Build Alternative 3a conditions would increase noise levels by up to 2 dBA over existing conditions and over No Build conditions. These noise level increases are not considered substantial per the Protocol. Traffic noise modeling results and predicted traffic noise impacts for existing and design year conditions are shown in Table 2.2-18 for Build Alternative 3a.

Build Alternative 3b was not modeled as part of the analysis but would have similar effects as Build Alternative 2b shown in Table 2.2-18. As discussed under Alternatives 2a and 2b, Build Alternatives 3a and 3b, respectively, are predicted to approach or exceed NAC at Category B and Category C receptors. Some of those receptors are already behind existing barriers. Noise abatement was considered for impacted receptors as further described in Section 2.2.8.4, Avoidance, Minimization, and/or Mitigation Measures.

Build Alternatives 4a and 4b

Construction

Build Alternatives 4a and 4b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Operation

Build Alternatives 4a and 4b would involve adding an HOT 3+ lane in each direction. Build Alternative 4b would also include building an I-80 connector structure. Noise increases under Alternatives 4a and 4b would be similar or less than that experienced under Build Alternatives 2b and 3a as shown in Table 2.2-18. Build Alternative 4b was not modeled as part of the analysis but would have similar effects as Build Alternative 2b shown in Table 2.2-18 because it would include the I-80 connector structure. As discussed under Alternatives 2a and 2b, Build

Alternatives 4a and 4b, respectively, are predicted to approach or exceed NAC at Category B and Category C receptors. Some of those receptors are already behind existing barriers. Noise abatement was considered for impacted receptors.

Build Alternatives 5a and 5b

Construction

Build Alternatives 5a and 5b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b, respectively.

Operation

Build Alternatives 5a and 5b would create an express lane in each direction where all users pay a fee regardless of vehicle occupancy. Noise increases under Build Alternatives 5a and 5b would be similar or less than that experienced under Alternatives 2b and 3a as shown in Table 2.2-18. Build Alternative 5b was not modeled as part of the analysis but would have similar effects as Build Alternative 2b shown in Table 2.2-18 because it would include the I-80 connector structure. As discussed under Alternatives 2a and 2b, all build conditions are predicted to approach or exceed NAC at Category B and Category C receptors. Some of those receptors are already behind existing barriers. Noise abatement was considered for impacted receptors.

Build Alternatives 6a and 6b

Construction

Build Alternatives 6a and 6b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively. Therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b, respectively.

Operation

Build Alternatives 6a and 6b would involve adding a transit-only lane in each direction. Build Alternative 6b would also include building an I-80 connector structure. Noise increases under Build Alternatives 6a and 6b would be similar or less than that experienced under Alternatives 2b and 3a as shown in Table 2.2-18. Build Alternative 6b was not modeled as part of the analysis, but would have similar effects as Build Alternative 2b shown in Table 2.2-18 because it would include the I-80 connector structure. As discussed under Alternatives 2a and 2b, all build conditions are predicted to approach or exceed NAC at Category B and Category C receptors. Some of those receptors are already behind existing barriers. Noise abatement was considered for impacted receptors.

Build Alternatives 7a and 7b

Construction

Construction phase noise and vibration effects described under Build Alternatives 7a and 7b would be shorter than the effects described under Build Alternatives 2a and 2b, respectively. Build Alternatives 7a and 7b would involve repurposing the current number 1 general purpose lane to HOV 2+ and therefore would have a shorter construction duration than Build Alternatives 2a and 2b through 6a and 6b. AMM NOI-1 would require noise-generating construction activities to 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, a construction noise monitoring program and provide additional noise controls would be implemented.

Caltrans Standard Specifications Section 14-8.02 would require that noise levels not to exceed 86 dBA within 50 feet of the job site from the hours of 9:00 PM to 6:00 AM (Standard Measure NOI-1). Build Alternatives 3a and 3b would also implement Standard Measures NOI-2 through NOI-5 to further reduce temporary construction noise levels. Therefore, temporary construction noise would have no adverse effects on nearby receptors.

The vibration analysis also found that no alternatives would exceed construction vibration limits during construction. Accordingly, under Build Alternatives 7a and 7b, neither construction noise nor vibration would result in an adverse impact.

Operation

Build Alternatives 7a and 7b would involve repurposing the current number 1 general purpose lane to HOV 2+. Build Alternative 7b would also include building an I-80 connector structure. Alternatives 7a and 7b would be similar or less than that experienced under Alternatives 2b and 3a as shown in Table 2.2-18. Build Alternative 7b was not modeled as part of the analysis but would have similar effects as Build Alternative 2b shown in Table 2.2-18 because it would include the I-80 connector structure. As discussed under Alternatives 2a and 2b, all build conditions are predicted to approach or exceed NAC at Category B and Category C receptors. Some of those receptors are already behind existing barriers. Noise abatement was considered for impacted receptors.

2.2.8.4 Avoidance, Minimization, and/or Mitigation Measures

Construction

- **AMM NOI-1:** Noise-generating construction activities will 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 will require the contractor to implement a construction noise monitoring program and provide additional noise controls where practical and feasible. Pile driving activities will be limited to daytime hours only.

Operation

Noise abatement was considered where noise impacts were predicted in areas of frequent human use that would benefit from a lowered noise level. Noise abatement must be predicted to provide a minimum of a 5 dB reduction at an impacted receptor to be considered feasible by Caltrans (i.e., the barrier would provide a noticeable noise reduction). Additionally, the Caltrans acoustical design goal states the barrier must achieve a 7 dB noise reduction at one or more benefited receptors.

Noise barriers were the only form of noise abatement considered for exterior land uses in the project area. Each noise barrier was evaluated for feasibility based on achievable noise reduction. As described in the Protocol, Caltrans typically limits noise barrier heights to 16 feet for seismic considerations. For each noise barrier found to be acoustically feasible, reasonable cost allowances were calculated by multiplying the number of benefited receptors by $107,000.

Preliminary noise barriers were evaluated at the most acoustically effective locations within the right-of-way. Where the roadway is at grade, or elevated above receptors, the most acoustically effective location for a barrier is near the edge of the shoulder, either on the structure or at the top of the slope. Where the roadway is located in a cut-section, the most acoustically effective location for a barrier is typically at the right-of-way. Barrier analysis was performed in accordance with the Protocol for instances where noise levels at receptors located behind existing noise barriers approached or exceeded the NAC. If, through a comparison of project noise levels with and without the existing barrier, the existing barrier meets the feasibility and acoustical reasonableness requirements for noise reduction, no modifications to the existing barrier or additional abatement were considered.

Eight new noise barriers were studied as potential noise abatement. In addition, 2049 Build noise levels were calculated to approach or exceed the NAC at locations behind four existing barriers. These existing barriers were assessed for feasibility and reasonableness. If the existing barriers did not meet feasibility and acoustical reasonableness requirements, additional barrier heights were considered.

Barrier 1

The outdoor use area at the residential property located at 9460 W Chiles Road (represented by Receptor R150), has been identified for noise abatement because modeled 2049 Build Alternative 3a noise levels would approach or exceed the NAC.

Evaluated Barrier 1 was modeled along the I-80 eastbound travel lanes, extending approximately 970 feet. Table 2.2-20 shows the 2049 Build noise levels and insertion loss for Evaluated Barrier 1 at various design heights.

Table 2.2-20. Evaluated Barrier 1: 2049 Build Noise Levels and Insertion Loss

Receptor ID	Units Represented	2049 Noise Level w/o Wall	$L_{eq[h]}$ Wall H=6 ft	I.L. Wall H=6 ft	$L_{eq[h]}$ Wall H=8 ft	I.L. Wall H=8 ft	$L_{eq[h]}$ Wall H=10 ft	I.L. Wall H=10 ft	$L_{eq[h]}$ Wall H=12[1] ft	I.L. Wall H=12[1] ft	$L_{eq[h]}$ Wall H=14[1] ft	I.L. Wall H=14[1] ft	$L_{eq[h]}$ Wall H=16[1] ft	I.L. Wall H=16[1] ft
R150	1	72	67	5	66	6	65	7	64	8	64	8	64	8

Note: 1 Barrier breaks line of sight between 11.5-foot-high truck stack and 5-foot-high receptor.
Key: H = Height; Leq[h] = The 1-hour A-weighted equivalent sound level; I.L. = Insertion Loss

As shown in Table 2.2-20, Evaluated Barrier 1 would feasibly abate traffic noise at a minimum height of 6 feet, but would not meet the 7 dB design goal. Evaluated Barrier 1 would feasibly abate traffic noise and meet the 7 dB noise reduction goal at a minimum height of 10 feet.

Barrier 2

The pool area at La Quinta Inn & Suites by Wyndham Davis (represented by Receptor ST-12) has been identified for noise abatement because modeled 2049 Build noise levels would exceed the NAC.

Evaluated Barrier 2 was modeled along the I-80 eastbound travel lanes, extending approximately 560 feet. Table 2.2-21 shows the modeled 2049 Build noise levels and insertion loss for Evaluated Barrier 2 at various design heights.

Table 2.2-21. Evaluated Barrier 2: 2049 Build Noise Levels and Insertion Loss

Receptor ID	Units Represented	2049 Noise Level w/o Wall	$L_{eq[h]}$ Wall H=6 ft	I.L. Wall H=6 ft	$L_{eq[h]}$ Wall H=8 ft	I.L. Wall H=8 ft	$L_{eq[h]}$ Wall H=10 ft	I.L. Wall H=10 ft	$L_{eq[h]}$ Wall H=12[1] ft	I.L. Wall H=12[1] ft	$L_{eq[h]}$ Wall H=14[1] ft	I.L. Wall H=14[1] ft	$L_{eq[h]}$ Wall H=16[1] ft	I.L. Wall H=16[1] ft
ST-12	1	71	70	1	70	1	69	2	69	2	69	2	68	3

Note: 1 Barrier breaks line of sight between 11.5-foot-high truck stack and 5-foot-high receptor.
Key: H = Height; Leq[h] = The 1-hour A-weighted equivalent sound level; I.L. = Insertion Loss

As indicated above in Table 2.2-21, Evaluated Barrier 2 would not feasibly abate traffic noise or meet the 7 dB noise reduction goal, at any impacted receptors, even at a height of 16 feet. Therefore, this barrier is not considered to be feasible and new abatement measures are not recommended. A reasonability analysis was not performed because feasibility was not achieved.

Existing Barriers A.1, A.2, A.3

The private outdoor areas of residences at the homes east of Harbor Boulevard, represented by Receptors R70 and R71, have been identified for noise abatement because 2049 Build noise levels would exceed the NAC. Receptors R70 and R71 are shielded from US-50 by an existing 15- to 16-foot-high noise barrier (Existing Barrier A.1) located along US-50 westbound travel lanes.

The private outdoor areas of residences at the homes east of Harbor Boulevard, represented by Receptors R75, R76, R77, R78, and R79, have been identified for noise abatement because 2049 Build noise levels would exceed the NAC. Receptors R75, R76, R77, R78, and R79 are shielded from US-50 by an existing 11- to 16-foot-high noise barrier (Existing Barrier A.2) located along US-50 westbound travel lanes.

The private outdoor areas of residences at the homes east of Harbor Boulevard, represented by Receptors R80, R81, and ST-49, have been identified for noise abatement because 2049 Build noise levels would exceed the NAC. Receptors R80, R81, and ST-49 are shielded from US-50 by an existing 16- to 11-foot-high noise barrier (Existing Barrier A.3) located along US-50 westbound travel lanes.

As summarized in Table 2.2-22, existing Barriers A.1, A.2 and A.3 were calculated to provide 5 dB of noise reduction at R78, 6 dB of noise reduction at R73, and 7 dB of noise reduction at R76, therefore meeting the noise reduction standard for feasibility. The barrier was calculated to provide noise reduction at other receptors in the area, including 9 dB of noise reduction at R68, 10 dB of noise reduction at R72, 11 dB of noise reduction at R70, 12 dB of noise reduction at R71, 13 dB of noise reduction at R75, 14 dB of noise reduction at R80, and 15 dB noise reduction at R79 and ST-49, therefore meeting the noise reduction design goal. Existing Barriers A.1, A.2, and A.3 meet the noise reduction standard for feasibility and the noise reduction design goal.

Table 2.2-22. Existing Barriers A.1, A.2, and A.3

Receptor ID	Units Represented	Noise Level without Wall	$L_{eq[h]}$ with Existing Wall H=11 to 16 feet	I.L. with Existing Wall H=11 to 16 feet
R68	1	77	68	9
R69	1	65	62	3
R70	6	81	70	11
R71	6	82	70	12
R72	6	77	67	10
R73	12	72	66	6
R74	1	66	63	3
R75	7	82	69	13
R76	8	67	59	7
R77	10	61	58	2
R78	5	65	60	5
R79	5	83	68	15
R80	3	82	68	14
R81	6	64	60	4
ST-49	1	85	70	15

Key: Key: H = Height;Leq[h] = The 1-hour A-weighted equivalent sound level; I.L. = Insertion Loss

As shown above, Existing Barriers A.1, A.2, and A.3 would feasibly abate traffic noise and meet the 7 dB design goal at its existing heights of 11 feet to 16 feet.

Barrier 3

Evaluated Barrier 3 was modeled along the US-50 eastbound travel lanes, extending approximately 970 feet. Table 2.2-23 shows the 2049 Build noise levels and insertion loss for Evaluated Barrier 3 at various design heights.

Table 2.2-23. Evaluated Barrier 3 2049 Build Noise Levels and Insertion Loss

Receptor ID	Units Represented	2049 Noise Level w/o Wall	$L_{eq[h]}$ Wall H=6 ft	I.L. Wall H=6 ft	$L_{eq[h]}$ Wall H=8 ft	I.L. Wall H=8 ft	$L_{eq[h]}$ Wall H=10 ft	I.L. Wall H=10 ft	$L_{eq[h]}$ Wall H=12[1] ft	I.L. Wall H=12[1] ft	$L_{eq[h]}$ Wall H=14[1] ft	I.L. Wall H=14[1] ft	$L_{eq[h]}$ Wall H=16[1] ft	I.L. Wall H=16[1] ft
R151	1	70	66	4	66	4	66	4	64	6	64	6	64	6

Note: 1 Barrier breaks line of sight between 11.5-foot-high truck stack and 5-foot-high receptor.
Key: H = Height; Leq[h] = The 1-hour A-weighted equivalent sound level; I.L. = Insertion Loss

As shown above, Evaluated Barrier 3 would feasibly abate traffic noise at a height of 12 feet but would not meet the 7 dB noise reduction goal, at any impacted receptors, even at a height of 16 feet. Therefore, this barrier is not considered to be feasible and new abatement measures are not recommended. A reasonability analysis was not performed because feasibility was not achieved.

Existing Barriers B.1 and B.2

The private outdoor areas of residences at the homes east of Harbor Boulevard, represented by Receptors R82, R83, R84, R85, R86, R87, R88, R89, R90, R91, and R92, have been identified for noise abatement because 2049 Build noise levels would exceed the NAC. Receptors R82, R83, R84, R85, R86, R87, R88, R89, R90, R91, and R92 are shielded from US-50 by an existing 8- to 13.5-foot-high noise barrier (Existing Barrier B.1) located along US-50 westbound travel lanes.

The private outdoor areas of residences at the homes east of Harbor Boulevard, represented by Receptors R93, R94, R95, R96, and R97, have been identified for noise abatement because 2049 Build noise levels would exceed the NAC. Receptors R93, R94, R95, R96, and R97 are shielded from US-50 by an existing 11.5- to 9-foot-high noise barrier (Existing Barrier B.2) located along US-50 westbound travel lanes.

As shown in Table 2.2-24, existing Barriers B.1 and B.2 were calculated to provide 6 dB of noise reduction at R85, and 7dB of noise reduction at R84, therefore meeting the noise reduction standard for feasibility. The barriers were calculated to provide noise reduction at other receptors in the area, including 8 dB of noise reduction at R83, 9 dB of noise reduction at R82, therefore meeting the noise reduction design goal. Existing Barriers B.1 and B.2 meet the noise reduction standard for feasibility and the noise reduction design goal.

Table 2.2-24. Existing Barriers B.1 and B.2

Receptor ID	Units Represented	Noise Level without Wall	$L_{eq[h]}$ with Existing Wall H=8 to 13.5 feet	I.L. with Existing Wall H=8 to 13.5 feet
R82	6	80	71	9
R83	7	79	71	8
R84	9	78	71	7
R85	2	78	71	6
R86	10	61	72	1
R87	10	62	60	2
R88	13	63	60	1
R89	9	63	62	1
R90	4	63	62	1
R91	8	65	62	1
R92	3	73	64	1
R93	11	66	70	3
R94	5	64	66	0
R95	7	64	64	0
R96	5	66	64	0
R97	4	67	66	0

Key: H = Height;:Leq[h] = The 1-hour A-weighted equivalent sound level; I.L. = Insertion Loss

As shown above, Existing Barriers B.1 and B.2 would feasibly abate traffic noise and meet the 7 dB design goal at its existing heights of 8 feet to 13.5 feet.

Existing Barrier 4.1 and 4.2

The private outdoor areas of residences at the US-50 and I-5 interchange, represented by Receptors ST-60, R99, and R100, have been identified for noise abatement because modeled 2049 Build noise levels would approach or exceed the NAC.

Evaluated Barriers 4.1 and 4.2 were modeled along the US-50 westbound ramp onto the I-5 northbound, extending approximately 700 feet and 760 feet, respectively. Table 2.2-25 shows the 2049 Build noise levels and insertion loss for Evaluated Barriers 4.1 and 4.2 at various design heights.

Table 2.2-25. Evaluated Barriers 4.1 and 4.2 in Segment 3b: 2049 Build Noise Levels and Insertion Loss

Receptor ID	Units Represented	2049 Noise Level w/o Wall	$L_{eq[h]}$ Wall H=6 ft	I.L. Wall H=6 ft	$L_{eq[h]}$ Wall H=8 ft	I.L. Wall H=8 ft	$L_{eq[h]}$ Wall H=10 ft	I.L. Wall H=10 ft	$L_{eq[h]}$ Wall H=12[1] ft	I.L. Wall H=12[1] ft	$L_{eq[h]}$ Wall H=14[1] ft	I.L. Wall H=14[1] ft	$L_{eq[h]}$ Wall H=16[1] ft	I.L. Wall H=16[1] ft
ST-60	1	72	69	3	69	3	68	4	68	4	68	4	67	5
R99	9	72	70	2	69	3	69	3	68	4	68	4	67	5
R100	7	65	64	1	64	1	63	2	63	2	63	2	63	2

Note: 1 Barrier breaks line of sight between 11.5-foot-high truck stack and 5-foot-high receptor.
Key: H = Height; Leq[h] = The 1-hour A-weighted equivalent sound level; I.L. = Insertion Loss

As shown above, Evaluated Barriers 4.1 and 4.2 would feasibly abate traffic noise at a height of 16 feet but would not meet the 7 dB noise reduction goal, at any impacted receptors, even at a height of 16 feet. Therefore, this barrier is not considered to be feasible and new abatement measures are not recommended. A reasonability analysis was not performed because feasibility was not achieved.

Existing Barrier C

The private outdoor areas of residences at the I-80 US-50 interchange, represented by Receptors R60, R61, R62, R63, R64, R65, R66, ST-40, and ST-41, have been identified for noise abatement because modeled 2049 Build noise levels would approach or exceed the NAC. Receptors R60, R61, R62, R63, R64, R65, R66, ST-40, and ST-41 are shielded from US-50 by an existing 8- to 13.5-foot-high noise barrier (Existing Barrier C) located along US-50 westbound travel lanes and along the US-50 westbound to I-80 eastbound ramp.

As summarized in Table 2.2-26, existing Barrier C was calculated to provide 5 dB of noise reduction at R64 and 6 dB of noise reduction at R61, therefore meeting the noise reduction standard for feasibility. The barrier was calculated to provide noise reduction at other receptors in the area, including 9 dB of noise reduction at ST-40, 11 dB of noise reduction at ST-41, 14 dB of noise reduction at R65, therefore meeting the noise reduction design goal. Existing Barrier C meets the noise reduction standard for feasibility and the noise reduction design goal.

Table 2.2-26. Existing Barrier C: 2049 Build Noise Levels and Insertion Loss

Receptor ID	Units Represented	Noise Level without Wall	$L_{eq[h]}$ with Existing Wall H=8 to 13.5 feet	I.L. with Existing Wall H=8 to 13.5 feet
R60	8	64	62	2
R61	10	70	64	6
R62	14	63	63	0
R63	11	66	62	4
R64	4	63	58	5
R65	1	80	66	14

Receptor ID	Units Represented	Noise Level without Wall	$L_{eq[h]}$ with Existing Wall H=8 to 13.5 feet	I.L. with Existing Wall H=8 to 13.5 feet
R66	1	58	56	2
ST-40	1	75	66	9
ST-41	1	77	66	11

Key: H = Height;Leq[h] = The 1-hour A-weighted equivalent sound level; I.L. = Insertion Loss

As shown above, Existing Barrier C would feasibly abate traffic noise and meet the 7 dB design goal at its existing heights of 8 feet to 13.5 feet.

Barrier 5

The private outdoor areas of residences at the I-80 US-50 interchange, represented by Receptors R102, R103, R104, R105, R152, R153, R154, and R155, have been identified for noise abatement because modeled 2049 Build noise levels would approach or exceed the NAC. Meadowdale Park, represented by ST-38, has also been identified for noise abatement because 2049 Build noise levels would approach or exceed the NAC.

Evaluated Barrier 5 was modeled along the US-50 westbound ramp onto the I-80 eastbound, extending approximately 1,200 feet. Table 2.2-27 shows the 2049 Build noise levels and insertion loss for Evaluated Barrier 5 at various design heights.

Table 2.2-27. Evaluated Barrier 5: 2049 Build Noise Levels and Insertion Loss

Receptor ID	Units Represented	2049 Noise Level w/o Wall	$L_{eq[h]}$ Wall H=6 ft	I.L. Wall H=6 ft	$L_{eq[h]}$ Wall H=8 ft	I.L. Wall H=8 ft	$L_{eq[h]}$ Wall H=10 ft	I.L. Wall H=10 ft	$L_{eq[h]}$ Wall H=12[1] ft	I.L. Wall H=12[1] ft	$L_{eq[h]}$ Wall H=14[1] ft	I.L. Wall H=14[1] ft	$L_{eq[h]}$ Wall H=16[1] ft	I.L. Wall H=16[1] ft
R102	3	65	63	2	62	3	62	3	61	4	61	4	60	5
R103	11	62	61	1	60	2	60	2	59	3	59	3	59	3
R104	4	65	63	2	63	2	62	3	61	4	61	4	61	4
R105	1	69	67	2	66	3	65	4	65	4	64	5	64	5
R152	2	67	65	2	65	2	64	3	63	4	63	4	63	4
R153	3	66	64	2	63	3	62	4	62	4	62	4	62	4
R154	3	65	63	2	62	3	62	3	61	4	61	4	61	4
R155	2	67	64	3	63	4	63	4	62	5	62	5	62	5
ST-38	1	67	66	1	65	2	65	2	65	2	65	2	64	3

Note: 1 Barrier breaks line of sight between 11.5-foot-high truck stack and 5-foot-high receptor.
Key: H = Height; Leq[h] = The 1-hour A-weighted equivalent sound level; I.L. = Insertion Loss

As indicated above, Evaluated Barrier 5 would feasibly abate traffic noise at a height of 12 feet but would not meet the 7 dB noise reduction goal, at any impacted receptors, even at a height of

16 feet. Therefore, this barrier is not considered to be feasible and new abatement measures are not recommended.

Barrier 6 and 7

The private outdoor areas of residences at the Sacramento River, represented by Receptors ST-62, R106, R107, R108, R109, and R110, have been identified for noise abatement because modeled 2049 Build noise levels would approach or exceed the NAC.

Evaluated Barriers 6 and 7 were modeled along the I-80 eastbound and westbound travel lanes, extending approximately 600 feet and 650 feet, respectively. Table 2.2-28 shows the modeled 2049 Build noise levels and insertion loss for Evaluated Barriers 6 and 7 at various design heights.

Table 2.2-28. Evaluated Barriers 6 and 7: 2049 Build Noise Levels and Insertion Loss

Receptor ID	Units Represented	2049 Noise Level w/o Wall	$L_{eq[h]}$ Wall H=6 ft	I.L. Wall H=6 ft	$L_{eq[h]}$ Wall H=8 ft	I.L. Wall H=8 ft	$L_{eq[h]}$ Wall H=10 ft	I.L. Wall H=10 ft	$L_{eq[h]}$ Wall H=12[1] ft	I.L. Wall H=12[1] ft	$L_{eq[h]}$ Wall H=14[1] ft	I.L. Wall H=14[1] ft	$L_{eq[h]}$ Wall H=16[1] ft	I.L. Wall H=16[1] ft
ST-62	1	66	63	3	62	4	62	4	61	5	61	5	61	5
R106	1	71	71	0	70	1	70	1	70	1	70	1	70	1
R107	1	70	69	1	69	1	69	1	69	1	69	1	69	1
R108	1	66	62	4	62	4	62	4	61	5	61	5	61	5
R109	1	67	65	2	63	4	63	4	63	4	63	4	63	4
R110	1	66	64	2	64	2	64	2	64	2	64	2	64	2

Note: 1 Barrier breaks line of sight between 11.5-foot-high truck stack and 5-foot-high receptor.
Key: H = Height; Leq[h] = The 1-hour A-weighted equivalent sound level; I.L. = Insertion Loss

As indicated above, Evaluated Barriers 6 and 7 would feasibly abate traffic noise at a height of 12 feet but would not meet the 7 dB noise reduction goal, at any impacted receptors, even at a height of 16 feet. Therefore, this barrier is not considered to be feasible and new abatement measures are not recommended. A reasonability analysis was not performed because feasibility was not achieved.

Barrier 8

The private outdoor areas of residences at the subdivision north of the Sacramento River, represented by Receptors ST-65, ST-66, R111, R112, and R113, have been identified for noise abatement because modeled 2049 Build noise levels would approach or exceed the NAC.

Evaluated Barrier 8 was modeled along the I-80 eastbound lanes, extending approximately 750 feet. Table 2.2-29 shows the modeled 2049 Build noise levels and insertion loss for Evaluated Barrier 8 at various design heights.

Table 2.2-29. Evaluated Barrier 8: 2049 Build Noise Levels and Insertion Loss

Receptor ID	Units Represented	2049 Noise Level w/o Wall	$L_{eq[h]}$ Wall H=6 ft	I.L. Wall H=6 ft	$L_{eq[h]}$ Wall H=8 ft	I.L. Wall H=8 ft	$L_{eq[h]}$ Wall H=10 ft	I.L. Wall H=10 ft	$L_{eq[h]}$ Wall H=12[1] ft	I.L. Wall H=12[1] ft	$L_{eq[h]}$ Wall H=14[1] ft	I.L. Wall H=14[1] ft	$L_{eq[h]}$ Wall H=16[1] ft	I.L. Wall H=16[1] ft
ST-65	1	71	69	2	68	3	67	4	66	5	66	5	66	5
ST-66	1	60	59	1	59	1	59	1	58	2	58	2	58	2
R111	8	66	62	4	61	5	60	6	60	6	60	6	60	6
R112	4	62	60	2	58	4	58	4	57	5	57	5	57	5
R113	8	67	64	3	63	4	62	5	61	6	61	6	61	6

Note: 1 Barrier breaks line of sight between 11.5-foot-high truck stack and 5-foot-high receptor.
Key: H = Height; Leq[h] = The 1-hour A-weighted equivalent sound level; I.L. = Insertion Loss

As indicated above in Table 2.2-29, Evaluated Barrier 8 would feasibly abate traffic noise at a height of 8 feet but would not meet the 7 dB noise reduction goal, at any impacted receptors, even at a height of 16 feet. Therefore, this barrier is not considered to be feasible and new abatement measures are not recommended. A reasonability analysis was not performed because feasibility was not achieved.

Existing Barrier D

The private outdoor areas of residences north of the Sacramento River to West El Camino Avenue, represented by Receptors ST-68, ST-70, ST-72, ST-73, ST-74, ST-75, R125, R126, R127, R128, R129, R130, R131, R132, R133, R134, R135, R136, R137, R138, R139, R140, R141, R142, R143, and R144, have been identified for noise abatement because modeled 2049 Build noise levels would exceed the NAC. River Otter Park, represented by Receptor ST-71, has been identified for noise abatement because modeled 2049 Build noise levels would exceed the NAC. Receptors ST-68, ST-69, ST-70, ST-71, ST-72, ST-73, ST-74, ST-75, R125, R126, R127, R128, R129, R130, R131, R132, R133, R134, R135, R136, R137, R138, R139, R140, R141, R142, R143, and R144 are shielded from I-80 by an existing 12.5- to 13-foot-high noise barrier (Existing Barrier D) located along I-80 eastbound travel lanes.

As summarized in Table 2.2-30, existing Barrier D was calculated to provide 5 dB of noise reduction at R128, therefore meeting the noise reduction standard for feasibility. The barrier was calculated to provide noise reduction at other receptors in the area, including 7 dB of noise reduction at R139, 8 dB of noise reduction at ST-72 and ST-73, 9 dB of noise reduction at R125 and R126, and 10 dB of noise reduction at ST-70, ST-71, R130, and R141, therefore meeting the noise reduction design goal. Existing Barrier D meets the noise reduction standard for feasibility and the noise reduction design goal.

Table 2.2-30. Existing Barrier D: 2049 Build Noise Levels and Insertion Loss

Receptor ID	Units Represented	Noise Level without Wall	Leq[h] with Existing Wall H=12.5 to 13 feet	I.L. with Existing Wall H=12.5 to 13 feet
ST-68	1	68	66	2
ST-70	1	77	67	10
ST-71	1	75	65	10
ST-72	1	66	58	8
ST-73	1	68	60	8
ST-74	1	73	62	11
ST-75	3	59	55	4
R125	5	76	67	9
R126	5	75	66	9
R127	6	59	59	0
R128	8	65	60	5
R129	5	58	56	2
R130	11	74	64	10
R131	8	62	58	4
R132	10	54	54	0
R133	8	55	53	2
R134	6	68	60	8
R135	3	57	54	3
R136	14	57	56	1
R137	6	55	54	1
R138	16	57	55	2
R139	10	68	61	7
R140	20	56	54	0
R141	7	76	66	10
R142	6	56	55	1
R143	40	53	52	1
R144	7	63	63	0

Key: H = Height;Leq[h] = The 1-hour A-weighted equivalent sound level; I.L. = Insertion Loss

As shown in Table 2.2-30, Existing Barrier D would feasibly abate traffic noise and meet the 7 dB design goal at its existing heights of 12.5 feet to 13 feet.

Noise Abatement Evaluation Summary

The overall reasonableness of noise abatement is determined by the following three factors:

- The noise reduction design goal (a barrier must be predicted to provide at least 7 dB of noise reduction at one or more benefited receptors).
- The cost of noise abatement (reasonable allowance of $107,000 per benefited receptor).
- The viewpoints of benefited receptors (including property owners and residents of the benefited receptors).

For any noise barrier to be considered reasonable from a cost perspective, the estimated cost of the barrier should be equal to or less than the total cost allowance calculated for the barrier. The cost calculations of the noise barrier must include all items appropriate and necessary for construction of the barrier, such as traffic control, drainage modification, retaining walls, landscaping for graffiti abatement, and right-of-way costs.

Table 2.2-31 lists the reasonableness allowance calculated for all barriers that were calculated to be acoustically feasible and to meet the Caltrans noise reduction design goal. For each noise barrier found to be acoustically feasible, reasonable cost allowances were calculated by multiplying the number of benefited receptors by $107,000.

Table 2.2-31. Summary of Acoustically Feasible and Reasonable Noise Barriers and Replacement Barriers

Barrier ID	Approximate Stationing/ Location[1]	Noise Level without Barrier at Benefited Receptors ($L_{eq[h]}$)	Barrier Height (feet)	Insertion Loss (dBA)	Number of Benefited Receptors	Total Reasonable Monetary Allowance
Evaluated Barrier 1	Along I-80 eastbound from south of Richards Boulevard to north of railroad tracks (970 ft)	72	10	-7	1	$107,000
			12[2]	-8	1	$107,000
			14[2]	-8	1	$107,000
			16[2]	-8	1	$107,000

Notes:
1. 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.
2. Barrier breaks line of sight between 11.5-foot-high truck stack and 5-foot-high receptor.
Key: Leq[h] = The 1-hour A-weighted equivalent sound level; dBA = A-weighted decibels

According to the Noise Abatement Decision Report (Caltrans 2022b), the evaluated barriers would cost significantly more than the reasonable monetary allowance that it would be allocated. As such, the evaluated barriers are considered unreasonable and were not recommended and are therefore not considered further. Without noise barriers, interior noise levels are anticipated to increase by a maximum of 2 dBA at sensitive receptors (Table 2.2-18). This change is barely perceivable by the human ear, therefore there would not be an adverse impact.

2.2.9 Energy

2.2.9.1 Regulatory Setting

The National Environmental Policy Act (NEPA) (42 U.S. Code Part 4332) requires the identification of all potentially significant impacts on the environment, including impacts on energy resources. Guidance for evaluating energy impacts of transportation projects subject to NEPA is outlined in FHWA's Technical Advisory T 6640.8A (Technical Advisory). The Technical Advisory energy analysis requirement applies to projects for which an Environmental Impact Statement (EIS) is prepared. The Technical Advisory indicates that documentation should discuss energy requirements for construction and operation, and the overall conservation potential for each of the project alternatives. The relationship of the project alternatives to applicable state or regional energy plan should also be documented. Additional conservation measures, such as use of high-occupancy vehicle incentives and other measures to improve traffic flow should also be identified.

Other measures to improve energy efficiency in the transportation sector have been implemented at the federal level. In recent years, the United States Environmental Protection Agency (U.S. EPA) and the National Highway Traffic Safety Administration (NHTSA) issued Final Rules governing Corporate Average Fuel Economy (CAFE) standards and other improvements to fuel economy to new vehicles.

On December 28, 2018, the Governor's Office of Planning and Research and the California Natural Resources Agency updated the California Environmental Quality Act (CEQA) Guidelines to require that an environmental document include an analysis of a project's potential for significant environmental effects resulting from wasteful, inefficient, or unnecessary use of energy; or wasteful use of energy resources (Guidelines § 15126.2(b)). The Initial Study/Negative Declaration/Mitigated Negative Declaration (IS/ND/MND) or Environmental Impact Report shall describe feasible measures which could minimize inefficient and unnecessary consumption of energy (Guidelines § 15126.4) and examples of energy conservation measures are provided in the Guidelines Appendix F.

Assembly Bill (AB) 32 codified the 2020 greenhouse gas (GHG) emissions reduction goals outlined in Executive Order (EO) S-3-05. Senate Bill 32 codified the GHG reduction targets established in EO B-30-15 to achieve a mid-range goal of 40 percent below 1990 levels by 2030. The California Air Resources Board (ARB) is required to create a scoping plan and implement rules to achieve “real, quantifiable, cost-effective reductions of greenhouse gases.” The law requires ARB to adopt rules and regulations to achieve the maximum technologically feasible and cost-effective GHG reductions. Energy use and efficiency are important considerations for achieving state goals to reduce greenhouse gas emissions.

2.2.9.2 Affected Environment

The I-80/US-50 corridor experiences heavy congestion during commute periods due to high vehicular demand. The corridor has infrastructure deficiencies, such as short weaving and merging areas, lane drops that create bottlenecks, incomplete ramp metering and auxiliary lane systems, and inadequate ITS elements. The corridor also experiences recreational traffic, leading to heavy congestion on weekends and holidays.

The Yolo Bypass Causeway is the only direct route connecting the Davis area to West Sacramento and beyond. Heavy congestion and stop-and-go traffic have contributed to increased vehicle emissions, travel costs, emergency response times, and reduced travel time reliability. The congestion has been created by multiple factors, including high traffic volumes, short weaving and merging areas, lane drops, limited sight distances, and incomplete bus and carpool lanes, ramp metering, and auxiliary lane networks.

Motorists traveling on I-80/US-50 experience delays throughout the day, with congestion at its maximum during the afternoon peak period. Data analysis shows that in the eastbound direction, the peak hour occurs during the 4:00 p.m. to 5:00 p.m. hour, with the peak period starting from 3:00 p.m. and lasting to 7:00 p.m. through Davis, and travel being impacted by bottlenecks at Richards Boulevard and Mace Boulevard. Significant morning delays on westbound I-80 occur between 8:00 a.m. to 10:00 a.m., with a severe bottleneck forming at the I-80/US-50 interchange when travel demand volumes are at their peak because of commute-related trips. Westbound US-50 frequently experiences congestion due to queue spillback of traffic at the I-80/US-50 interchange bottleneck. Peak congestion on eastbound US-50 within the project limits occurs during the afternoon peak period, from 4:00 p.m. to 6:00 p.m. The I-80/US-50 corridor primarily operates at Level of Service (LOS) F during the morning and afternoon peak hours within the project limits. The LOS F conditions are anticipated to worsen due to the projected traffic growth in the area.

The existing Yolo 80 bikeway on the north side of the existing Yolo Causeway is underutilized by bicycle riders due to lack of connectivity. Currently, there are three entrance and exit points to the Yolo 80 bikeway. The configuration of the eastern terminus requires that east/west bicycle and pedestrian traffic traverse around the back of two gas stations to avoid several driveways of ingress and egress for automobile and commercial truck traffic. Bicycle and pedestrian traffic must then cross four lanes of traffic to proceed eastbound on West Capitol Avenue.

Transportation energy is generally described in terms of direct and indirect energy. Direct energy is the energy consumed in the actual propulsion (e.g., automobiles, trains, airplanes). This energy consumption is a function of traffic characteristics such as VMT, speed, vehicle mix, and thermal value of the fuel being used. Some projects may also include features such as new or replacement roadway lighting or other features requiring electricity, which is an ongoing and permanent source of direct energy consumption.

Indirect energy is defined as all of the remaining energy consumed to run a transportation system, including maintenance energy, and any substantial impacts on energy consumption related to project-induced land use changes and mode shifts, as well as any substantial changes in energy associated with vehicle operation, manufacturing, or maintenance due to increased automobile use. The one-time energy expenditure involved in constructing a project is also considered indirect energy.

Transportation energy is generally described in terms of direct and indirect energy. Direct energy is the energy consumed in the actual propulsion (e.g., automobiles, trains, airplanes).

This energy consumption is a function of traffic characteristics such as VMT, speed, vehicle mix, and thermal value of the fuel being used. Some projects may also include features such as new or replacement roadway lighting or other features requiring electricity, which is an ongoing and permanent source of direct energy consumption.

Indirect energy is defined as all of the remaining energy consumed to run a transportation system, including maintenance energy, and any substantial impacts on energy consumption related to project-induced land use changes and mode shifts, as well as any substantial changes in energy associated with vehicle operation, manufacturing, or maintenance due to increased automobile use. The one-time energy expenditure involved in constructing a project is also considered indirect energy.

2.2.9.3 Environmental Consequences

This section was prepared using the Energy Evaluation that was prepared for the project (Caltrans 2023j). The basic procedure for analyzing direct energy consumption from mobile sources is to calculate fuel consumption using CT-EMFAC2021. CT-EMFAC2021 is an emission model developed by Caltrans that calculates project-level emissions and fuel consumption using data from the California Air Resources Board's EMFAC model. The fuel consumption can be easily derived from the CT-EMFAC model run prepared for the criteria pollutant and GHG emissions analyses.

The basic procedure for analyzing indirect energy consumption from construction activities is to obtain fuel consumption projections in gallons from the Caltrans Construction Emission Tool (CAL-CET 2021, v1.0).

With regards to VMT, the Project level VMT distribution data and speed bins for the existing, no build, and build alternatives, along with the CT-EMFAC2021 emission rates, were used to calculate the fuel consumptions for the existing 2019, opening 2029, and design 2049 year conditions with (alternative option b) or without (alternative option a) an HOV-HOV connector.
Direct Energy

The project fuel consumption during construction is summarized in Table 2.2-32. Fuel consumption projections were determined from the Caltrans Construction Emission Tool (CAL-CET 2020).

Table 2.2-32. Project Level Fuel Consumption During Construction

Construction	Diesel (gallon/project)	Gasoline (gallon/project)	Electricity
Roadway	230,359	140,913	23,883
Bridge/Structures	140,161	23,775	7,661

Source: Caltrans District 3 Yolo Corridor Improvement Project Energy Study (Caltrans 2023j)

VMT data for the existing, No Build, and Build Alternatives, along with the CT-EMFAC2017 emission rates, were used to calculate the fuel consumptions for the existing 2019 and Opening

Year 2029. They are summarized in Table 2.2-33. The fuel consumption for the existing 2029 compared to horizon year 2049 conditions is summarized in Table 2.2-34.

Indirect Energy

Construction indirect energy consumption would result from traffic delays due to construction. The Project's TMP would reduce construction related traffic impacts. The TMP would assist in managing traffic congestion and provide signage to affected residents and businesses in the event temporary closures or detours are warranted during construction activities. Compared with indirect energy use by construction vehicles and equipment, indirect energy use due to construction-related traffic delays would be minimal and would be reduced with implementation of the TMP.

For indirect energy of maintaining the project (permanent impacts) in the long term, it will incorporate the use of energy-efficient lighting, such as LED traffic signals and streetlights, to the extent feasible. LED lights consume 10 percent of the electricity of traditional lights. Furthermore, Intelligent Transportation System (ITS) elements within the project limits would give travelers information about special events such as traffic congestion, accidents, and incidents such as terrorist attacks, AMBER/Silver/Blue Alerts, roadwork zones, or speed limits on a specific highway segment. Such ITS would save energy by notifying vehicles to take alternative routes, limit travel speed, warn of duration and location of the incidents, inform of the traffic conditions, or display public safety messages.

Table 2.2-33. Comparison between Existing, Build Alternatives and No Build Alternative in Fuel Consumption in Opening Year 2029 with Alternative a and Alternative b.

Opening	2019 Existing	2029 No Build	2029 Alt2a	2029 Alt 2b	2029 Alt3a	2029 Alt 3b	2029 Alt4a	2029 Alt 4b	2029 Alt 5a	2029 Alt 5b	2029 Alt6a	2029 Alt 6b	2029 Alt7a	2029 Alt 7b
Gasoline (gal/day)	118,115.7	112,737.4	96,895.4	113,602.2	96,101.1	113,240.1	94,586.6	111,806.4	93,065.5	110,301.0	89,144.9	104,470.5	91,917.2	107,769.4
Diesel (gal/day)	19,464.3	21,706.0	19,657.7	22,082.0	19,502.8	21,903.1	19,248.7	21,555.6	19,024.3	21,308.1	18,201.1	20,439.8	18,518.8	20,808.4
Natural Gas (diesel-equivalent gal)	1,001.3	987.9	886.9	1,022.5	868.5	998.7	867.2	981.8	868.9	974.6	874.1	1,006.8	962.1	1,111.9
Electricity (kilowatt-hr)	10,036.0	82,312.6	71,573.3	83,386.3	71,391.8	82,639.7	70,605.0	81,615.7	69,909.8	80,714.0	66,246.6	77,211.0	65,888.5	76,811.2
*Combined Gas+Diesel+ Natural Gas+Electricity (million BTU/day)	17,053.5	16,959.3	14,721.7	17,123.4	14,601.8	17,049.4	14,381.9	16,823.4	14,166.0	16,604.3	13,569.5	15,776.1	13,957.5	16,236.7
VMT	3,128,486	3,279,744	3,614,707	3,614,707	3,615,206	3,615,206	3,576,768	3,576,768	3,535,334	3,535,334	3,345,638	3,345,638	3,256,781	3,256,781
VMT Change (%) with No build/Build	—	—	10.2%	10.2%	10.2%	10.2%	9.1%	9.1%	7.8%	7.8%	2.0%	2.0%	-0.7%	-0.7%
% Fuel Consumption with No Build/Build	—	—	-13.2%	1.0%	-13.9%	0.5%	-15.2%	-0.8%	-16.5%	-2.1%	-20.0%	-7.0%	-17.7%	-4.3%
% Fuel Consumption with Existing/Build	—	-0.6%	-13.7%	0.4%	-14.3%	0%	-15.7%	-1.3%	-16.9%	-2.6%	-20.4%	-7.5%	-18.2%	-4.8%

Source: Caltrans District 3 Yolo Corridor Improvement Project Energy Study (Caltrans 2023j)
*Conversion factors were applied (120,286 BTU/gal Gas, 137,381 BTU/gal Diesel, and 3,412 BTU/kWh)
Key: VMT=vehicle miles traveled

Table 2.2-34. Comparison between Existing, Build and No Build in fuel consumption in Horizon Year 2049 with Alternative a and Alternative b

Horizon	2019 Existing	2049 No Build	2049 Alt2a	2049 Alt 2b	2049 Alt3a	2049 Alt 3b	2049 Alt4a	2049 Alt 4b	2049 Alt 5a	2049 Alt 5b	2049 Alt 6a	2049 Alt 6b	2049 Alt 7a	2049 Alt 7b
Gasoline (gal/day)	118,115.7	107,479.6	90,802.3	106,125.9	89,735.1	105,275.4	88,442.4	103,266.1	87,459.6	102,154.2	88,493.8	103,786.8	87,275.0	102,428.0
Diesel (gal/day)	19,464.3	18,282.5	16,331.1	18,395.5	16,217.0	18,298.0	16.007.0	17,975.7	15,828.6	17,843.6	15,718.6	17,745.2	15,436.8	17,430.6
Natural Gas (diesel-equivalent gal)	1,001.3	300.1	238.5	270.1	236.8	267.1	235.0	264.2	233.8	264.6	250.4	285.1	237.0	270.0
Electricity (kilowatt-hr)	10,036.0	233,749.4	209,457.4	241,193.3	208,109.3	40,462.5	205,610.9	235,691.1	203,737.5	234,315.9	198,723.7	228,827.8	195,505.0	225,226.6
*Combined Gas+Diesel+ Natural Gas+ Electricity (million BTU/day)	17,053.5	16,278.7	13,924.1	16,152.7	13,764.4	16,034.1	13,571.3	15,731.5	13,422.0	15,574.9	13,516.4	15,741.9	13,318.3	15,520.9
VMT	3,128,486	3,749,990	3,952,666	3,952,666	3,968,640	3,968,640	3,902,746	3,902,746	3,882,278	3,882,278	3,678,605	3,678,605	3,620,698	3,620,698
VMT Change (%) with No build/Build	—	—	5.4%	5.4%	5.8%	5.8%	4.1%	4.1%	3.5%	3.5%	-1.9%	-1.9%	-3.4%	-3.4%
% Fuel Consumption with No Build/Build	—	—	-14.5%	-0.8%	-15.4%	-1.5%	-16.6%	-3.4%	-17.5%	-4.3%	-17.0%	-3.3%	-18.2%	-4.7%
% Fuel Consumption with Existing/ Build	—	-4.5%	-18.4%	-5.3%	-19.3%	-6.0%	-20.4%	-7.8%	-21.3%	-8.7%	-20.7%	-7.7%	-21.9%	-9.0%

Source: Caltrans District 3 Yolo Corridor Improvement Project Energy Study (Caltrans 2023j)
*Conversion factors were applied (120,286 BTU/gal Gas, 137,381 BTU/gal Diesel, and 3,412 BTU/kWh)
Key: VMT=vehicle miles traveled

No Build Alternative 1

Construction and Operation

Under No Build Alternative 1, managed lanes and transportation improvements would not be constructed or operated. As such, No Build Alternative 1 would not involve any construction energy effects. Vehicles would continue to consume fuel and energy within the project area.

Build Alternatives 2a and 2b

Construction

Build Alternatives 2a and 2b would result in short-term energy consumption related to the manufacture of construction materials, the use of construction equipment that requires petroleum fuels, and the use of construction workers' motor vehicles as they travel to and from the site. Due to high daytime traffic volumes, night work would be expected. Both day and night work should be anticipated throughout the project duration. Thus, construction-related energy consumption would be finite and limited and would have an incremental impact on area energy supplies.

As indicated above, energy use associated with project construction under Build Alternatives 2a and 2b is conservatively estimated to result in the short-term consumption of 370,520 gallons of combined diesel and gasoline from construction equipment. This represents a small demand on local and regional fuel supplies that would be easily accommodated, and this demand would cease once construction is complete. Moreover, construction-related energy consumption would be temporary and not a permanent new source of energy demand, and demand for fuel would have no noticeable effect on peak or baseline demands for energy.

Construction indirect energy consumption would result from traffic delays due to construction. The project's TMP, as required per Standard Measure TT-3, would reduce construction-related traffic effects. The TMP would assist in managing traffic congestion and provide signage to affected residents and businesses in the event temporary closures or detours are warranted during construction activities. Compared with direct energy use by construction vehicles and equipment, indirect energy use due to construction-related traffic delays would be minimal and would be reduced with implementation of the TMP. Additionally, AMM Energy-1 would be implemented to help conserve energy during the construction period. Therefore, construction of the project would not result in an inefficient, wasteful, and unnecessary consumption of energy.

Operation

Build Alternatives 2a and 2b would involve adding an HOV2+ lane in each direction. Build Alternatives 2a and 2b would increase highway capacity which would result in an increase of traffic using the managed lanes and associated I-5/US-50 interchange and I-80/US-50 connectors. For opening year and horizon year, as shown in Table 2.2-33 and Table 2.2-34, Build Alternatives 2a and 2b would generate new vehicular traffic trips causing increased VMT. Direct energy consumption (i.e., fuel for vehicles) is expected to decrease about 13.2 percent for Build Alternative 2a and increase 1 percent for Build Alternative 2b as compared to No Build Alternative 1.

Although there is a modeled increase in VMT during operation of the project over the long term, newer and more fuel-efficient vehicles and electric vehicles would enter the fleet, resulting in an overall lower potential for an increase in energy consumption. When compared to No Build Alternative 1, Build Alternatives 2a and 2b are expected to result in a 14.5 percent and 0.8 percent, respectively, decrease in energy use in the year 2049 (Table 2.2-34). The project's proposed improvements under Build Alternatives 2a and 2b would improve roadway operations and reduce traffic delay within the project limits. Excess fuel consumption associated with vehicle delay and congestion within the project limits would decrease compared to No Build Alternative 1.

For indirect energy, the project would incorporate the use of energy-efficient lighting, such as LED traffic signals and streetlights, to the extent practicable. LED lights consume 10 percent of the electricity of traditional lights. Furthermore, ITS within the project limits would give travelers information such as traffic congestion, accidents, and other incidents that may cause traffic delays. ITS would save energy by notifying vehicles to take alternate routes, limit travel speed, warn of duration and location of incidents, inform travelers of traffic conditions, or display public safety messages.

When balancing energy used during construction and operation against energy saved by relieving congestion and other transportation efficiencies, the project would not have substantial energy effects. No adverse permanent effects are anticipated.

Build Alternatives 3a and 3b

Construction

Build Alternatives 3a and 3b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively; and construction effects would be similar.

Operation

Build Alternatives 3a and 3b would involve adding an HOT2+ lane in each direction. Permanent effects would be similar to Build Alternatives 2a and 2b; however, fuel consumption would be decreased by 13.9 percent for Build Alternative 3a and increased by 0.5 percent for Build Alternative 3b compared to No Build Alternative 1 in Opening Year 2029 (Table 2.2-33). When compared to No Build Alternative 1 in horizon year 2049, Build Alterative 3a would result in a decrease of 15.4 percent and Build Alternative 3b would result in a decrease of 1.5 percent. The effects would be slightly less than effects described under Build Alternatives 2a and 2b.

Build Alternatives 4a and 4b

Construction

Build Alternatives 4a and 4b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively; and construction effects would be similar.

Operation

Build Alternatives 4a and 4b would involve adding an HOT3+ lane in each direction. Permanent effects would be similar to Build Alternatives 2a and 2b, respectively; however, the fuel consumption would decrease by 15.2 percent under Build Alternative 4a and decreased by 0.8 percent under Build Alternative 4b compared to No Build Alternative 1 in Opening Year 2029 (Table 2.2 33). Fuel consumption would decrease 16.6 percent under Build Alternative 4a and decreased 3.4 percent under Build Alternative 4b compared to No Build Alternative 1 in the horizon year 2049. The effects would be slightly less than effects described under Build Alternatives 2a and 2b, respectively.

Build Alternatives 5a and 5b

Construction

Build Alternatives 5a and 5b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively; and construction effects would be similar.

Operation

Build Alternatives 5a and 5b would involve adding an Express Lane in each direction. Permanent effects would be similar to Build Alternatives 2a and 2b, respectively. The fuel consumption would decrease 16.5 percent under Build Alternative 5a and decrease 2.1 percent under Build Alternative 5b compared to No Build Alternative 1 in Opening Year 2029 (Table 2.2-33). Fuel consumption would decrease 17.5 percent under Build Alternative 5a and decrease 4.3 percent under Build Alternative 5b compared to No Build Alternative 1 in horizon year 2049. The effects would be slightly less than described under Build Alternatives 2a and 2b, respectively.

Build Alternatives 6a and 6b

Construction

Build Alternatives 6a and 6b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively; and construction effects would be similar.

Operation

Build Alternatives 6a and 6b would involve adding a transit-only lane in each direction. Permanent effects would be similar to Build Alternatives 2a and 2b, respectively; however, the fuel consumption would decrease 20.0 percent under Build Alternative 6a and decrease 7.0 percent under Build Alternative 6b compared to No Build Alternative 1 in Opening Year 2029 (Table 2.2-33). Fuel consumption would decrease 17.0 percent under Build Alternative 6a and decrease 3.3 percent under Build Alternative 6b compared to No Build Alternative 1 in horizon year 2049. Therefore, the effects would be slightly less than described under Build Alternatives 2a and 2b, respectively.

Build Alternatives 7a and 7b

Construction

Build Alternatives 7a and 7b would involve repurposing an existing general-purpose lane to HOV 2+. No new lanes would be constructed. Because Build Alternatives 7a and 7b would not add new lanes but would repurpose existing lanes as managed lanes, the Build Alternatives 7a and 7b construction period may have shorter duration resulting in fewer delays than those under Build Alternatives 2a, 2b, 3a, 3b, 4a, 4b, 5a, 5b, 6a, and 6b and would use less gasoline and fuel.

Operation

As no new lanes would be constructed, Build Alternatives 7a and 7b do not increase capacity due to replacing an existing traffic lane with an HOV 2+ lane. The fuel consumption would decrease 17.7 percent under Build Alternative 7a and decrease 4.3 percent under Build Alternative 7b compared to No Build Alternative 1 in Opening Year 2029 (Table 2.2 33). Fuel consumption would decrease 18.2 percent under Build Alternative 7a and decreased 4.7 percent under Build Alternative 7b compared to No Build Alternative 1 in horizon year 2049. The effects would be slightly less than described under Build Alternatives 2a and 2b, respectively.

2.2.9.4 Avoidance, Minimization, and/or Mitigation Measures

Caltrans would implement the following AMMs to reduce construction effects on energy consumption.

- **AMM ENERGY-1: Construction Energy Efficiency Plan**. As part of the Plans, Specifications, and Estimates (PS&E), the Resident Engineer will prepare a Construction Energy Efficiency Plan, which may include the following:
    - Reuse of existing rail, steel, and lumber, wherever possible, such as for falsework, shoring, and other applications during the construction process
    - Recycling of asphalt taken up from roadways, if practicable and cost-effective
    - Use of newer, more energy-efficient equipment, where feasible, and maintenance of older construction equipment to keep in good working order
    - Promoting of scheduling of construction operations to efficiently use construction equipment (i.e., only haul waste when haul trucks are full and combine smaller dozer operations into a single comprehensive operation, where possible)
    - Promotion of construction employee carpooling

2.3 Biological Environment

Caltrans prepared a Natural Environment Study (NES) to provide technical information to determine the extent that the project would affect plants, wildlife, and natural communities, including special-status species, potentially jurisdictional wetlands and waters, and protected plant communities (Caltrans 2022f). These biological resources are further detailed in the following sections. As summarized in Appendix E, Standard Measures BIO-1 through BIO-4 are incorporated into the project to avoid potential impacts on biological resources.

The biological study area (BSA) encompasses all currently proposed project improvements and ancillary construction areas (e.g., staging areas, access roads), and totals approximately 1,147.22 acres. For this project, the BSA encompasses the same boundary as the ESL.

2.3.1 Natural Communities

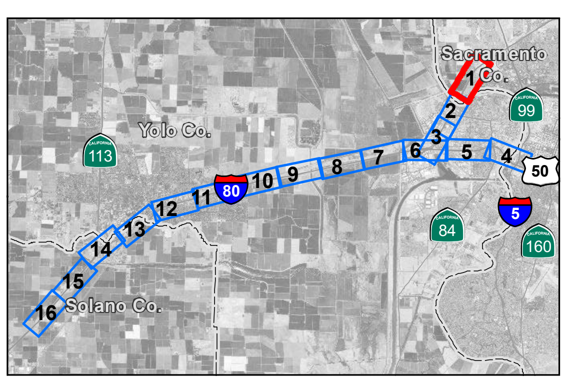
This section of the document discusses natural communities of concern. The focus of this section is on biological communities, not individual plant or animal species. This section also includes information on wildlife corridors and habitat fragmentation. Wildlife corridors are areas of habitat used by wildlife for seasonal or daily migration. Habitat fragmentation involves the potential for dividing sensitive habitat and thereby lessening its biological value.

Habitat areas that have been designated as critical habitat under the Federal Endangered Species Act are discussed below in the Threatened and Endangered Species Section 2.3.8. Wetlands and other waters are also discussed below in Section 2.3.2.

2.3.1.1 Affected Environment

On May 10-14 and 18-20, 2021, and July 14, 2022, a vegetation characterization survey was conducted within the BSA. Habitat types in the BSA were classified based on the California Wildlife Habitat Relationships (CWHR) classification scheme that used vegetation descriptions as developed in *A Guide to Wildlife Habitats of California* (Mayer and Laudenslayer 1988), which were converted (via crosswalk) from the vegetation alliance classification system described in *A Manual of California Vegetation, Second Edition* (MCV) (Sawyer et al. 2009) and the web-based version *Manual of California Vegetation Online* (CNPS 2021). A total of 21 MCV alliances that correspond to 11 CWHR habitat types were identified in the BSA (Figure 2.3-1) (Table 2.3-1). Descriptions of the 11 CHWR habitat types are detailed below.

More than 50 percent (685.29 acres) of the BSA was classified as either developed, or ornamental, with developed accounting for the highest acreage (595.93 acres). There are five natural/semi-natural habitat types that occur in the BSA, of which California Annual and Perennial Grassland accounted for the highest acreage (346.88 acres) comprising predominantly non-native grass species such as rye grass (*Festuca perennis*) and wild oats (*Avena* spp.).



ESL (1,147.22 acres)

Post Mile

County Line

Impacts to Vegetation Communities

Permanent Impact

Temporary Impact

Vegetation Communities

Developed

Ornamental

Valley oak woodland and forest

Wild oats and annual brome grasslands

Notes

1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2022
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Impacts to Sensitive Natural Communities

CWHR Community Type	CDFW Sensitive Natural Community	Temporary Impact (Acres)	Permanent Impact (Acres)
Valley Foothill Riparian	Oregon ash groves	1.87	0
	CA Sycamore Woodlands		
	Freemont Cottonwood Forest and Woodland		
Valley Oak Woodland	Valley Oak Woodland and Forest	0.51	0.14
Annual/Perennial Grassland	Gum Plant Patches	0.007	0
	Total	**2.387**	**0.14**

0 1,000

Feet

Caltrans

Figure 2.3-1

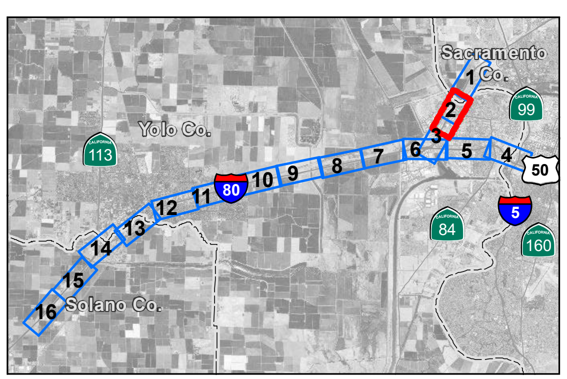
Impacts to Vegetation Communities

Yolo 80 Corridor Improvement Project

EA 03-3H900

Solano, Yolo, and Sacramento Counties, California

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\bio\Fig_2.3-1_DED_VegCommunity\Impacts.mxd Revised: 2022-12-06 By: pglendening



ESL (1,147.22 acres)

Post Mile

County Line

Vegetation Communities

- California sycamore woodlands
- Developed
- Fremont cottonwood forest and woodland
- Open water
- Ornamental
- Valley oak woodland and forest
- Wild oats and annual brome grasslands

Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2022
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Impacts to Sensitive Natural Communities

CWHR Community Type	CDFW Sensitive Natural Community	Temporary Impact (Acres)	Permanent Impact (Acres)
Valley Foothill Riparian	Oregon ash groves	1.87	0
	CA Sycamore Woodlands		
	Freemont Cottonwood Forest and Woodland		
Valley Oak Woodland	Valley Oak Woodland and Forest	0.51	0.14
Annual/Perennial Grassland	Gum Plant Patches	0.007	0
	Total	2.387	0.14

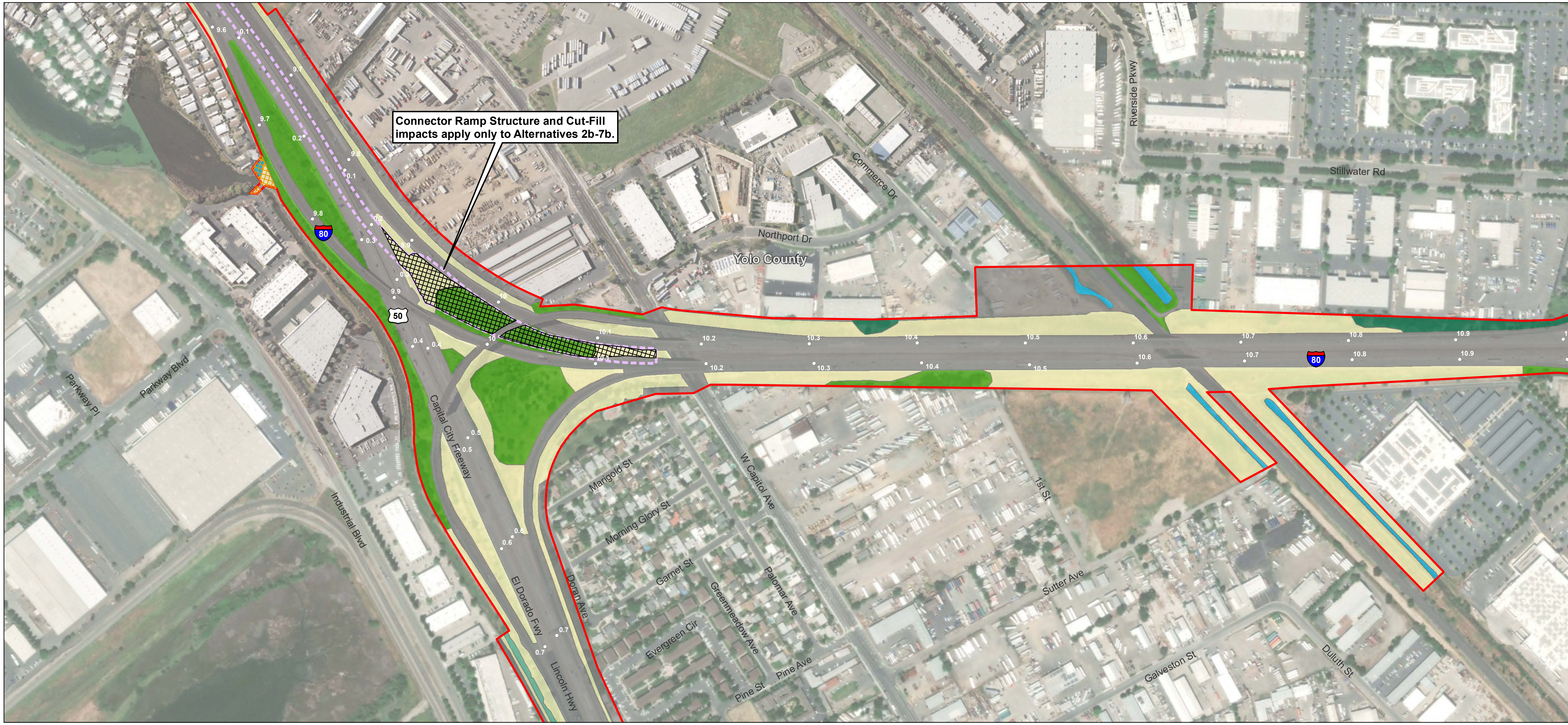
0 1,000

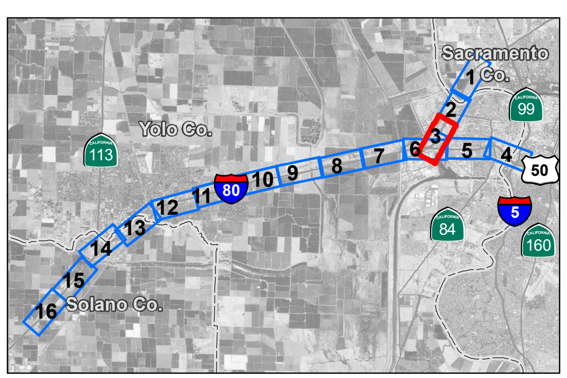
Feet

Caltrans

Figure 2.3-1
Impacts to Vegetation Communities
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\bio\Fig_2.3-1_DED_VegCommunityImpacts.mxd Revised: 2022-12-06 By: pglendening





Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2022
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

ESL (1,147.22 acres)
Connector Ramp and Associated Cut-Fill (Alternatives 2b-7b)
Post Mile

Impacts to Vegetation Communities
Permanent Impact
Temporary Impact

Vegetation Communities
Developed
Open water
Ornamental
Valley oak woodland and forest
Water primrose wetlands
Wild oats and annual brome grasslands

Impacts to Sensitive Natural Communities

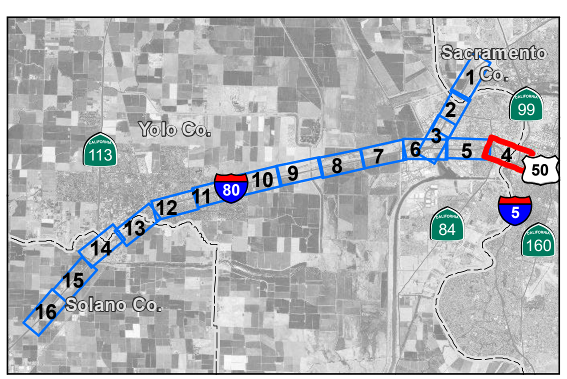
CWHR Community Type	CDFW Sensitive Natural Community	Temporary Impact (Acres)	Permanent Impact (Acres)
Valley Foothill Riparian	Oregon ash groves; CA Sycamore Woodlands; Freemont Cottonwood Forest and Woodland	1.87	0
Valley Oak Woodland	Valley Oak Woodland and Forest	0.51	0.14
Annual/Perennial Grassland	Gum Plant Patches	0.007	0
	Total	2.387	0.14

0 1,000
Feet

Caltrans

Figure 2.3-1
Impacts to Vegetation Communities
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\bio\Fig_2.3-1_DED_VegCommunityImpacts.mxd Revised: 2023-03-20 By: pglendening



ESL (1,147.22 acres)

Post Mile

County Line

Impacts to Vegetation Communities

Permanent Impact

Temporary Impact

Vegetation Communities

Developed

Fremont cottonwood forest and woodland

Open water

Ornamental

Wild oats and annual brome grasslands

Notes

1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2022
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Impacts to Sensitive Natural Communities

CWHR Community Type	CDFW Sensitive Natural Community	Temporary Impact (Acres)	Permanent Impact (Acres)
Valley Foothill Riparian	Oregon ash groves	1.87	0
	CA Sycamore Woodlands		
	Freemont Cottonwood Forest and Woodland		
Valley Oak Woodland	Valley Oak Woodland and Forest	0.51	0.14
Annual/Perennial Grassland	Gum Plant Patches	0.007	0
	Total	2.387	0.14

0 1,000

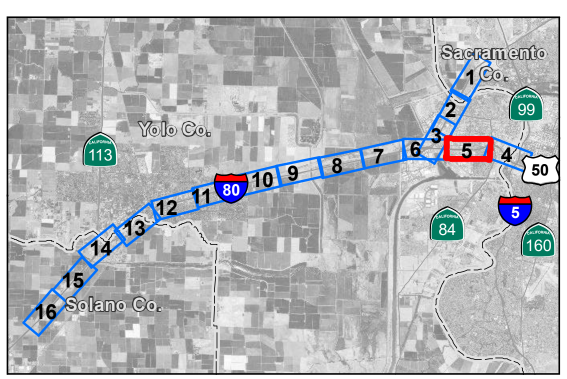
Feet

Caltrans

Figure 2.3-1
Impacts to Vegetation Communities
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

Sheet 4 of 16

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\bio\Fig_2.3-1_DED_VegCommunity\Impacts.mxd Revised: 2022-12-06 By: pglendening



ESL (1,147.22 acres)

Post Mile

Impacts to Vegetation Communities

Permanent Impact

Temporary Impact

Vegetation Communities

Developed

Ornamental

Wild oats and annual brome grasslands

Impacts to Sensitive Natural Communities

CWHR Community Type	CDFW Sensitive Natural Community	Temporary Impact (Acres)	Permanent Impact (Acres)
Valley Foothill Riparian	Oregon ash groves	1.87	0
	CA Sycamore Woodlands		
	Freemont Cottonwood Forest and Woodland		
Valley Oak Woodland	Valley Oak Woodland and Forest	0.51	0.14
Annual/Perennial Grassland	Gum Plant Patches	0.007	0
	Total	2.387	0.14

0 1,000

Feet

N

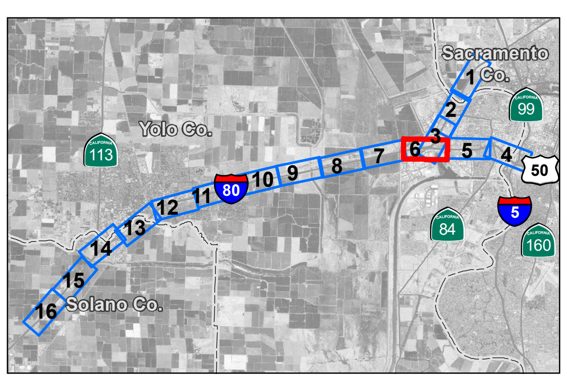
Caltrans

Notes

1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2022
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Figure 2.3-1
Impacts to Vegetation Communities
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\bio\Fig_2.3-1_DED_VegCommunity\Impacts.mxd Revised: 2022-12-06 By: pglendening



ESL (1,147.22 acres)

Connector Ramp and Associated Cut-Fill (Alternatives 2b-7b)

Post Mile

Impacts to Vegetation Communities

Permanent Impact

Temporary Impact

Vegetation Communities

Developed

Open water

Ornamental

Perennial pepper weed patches

Water primrose wetlands

Wild oats and annual brome grasslands

Impacts to Sensitive Natural Communities

CWHR Community Type	CDFW Sensitive Natural Community	Temporary Impact (Acres)	Permanent Impact (Acres)
Valley Foothill Riparian	Oregon ash groves CA Sycamore Woodlands Freemont Cottonwood Forest and Woodland	1.87	0
Valley Oak Woodland	Valley Oak Woodland and Forest	0.51	0.14
Annual/Perennial Grassland	Gum Plant Patches	0.007	0
	Total	**2.387**	**0.14**

0 1,000
Feet

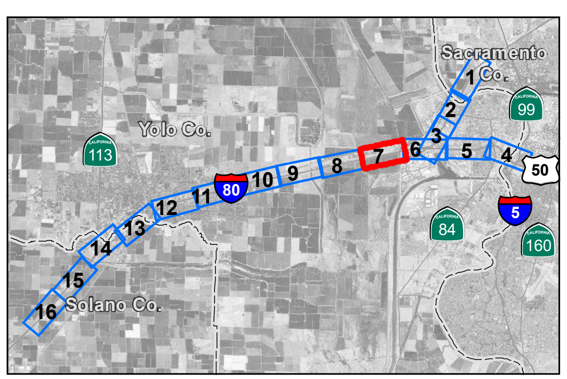
Caltrans

Figure 2.3-1
Impacts to Vegetation Communities
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

Sheet 6 of 16

Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2022
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\bio\Fig_2.3-1_DED_VegCommunityImpacts.mxd Revised: 2023-03-20 By: pglendening



Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2022
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

ESL (1,147.22 acres)
Post Mile

Impacts to Vegetation Communities
Temporary Impact

Vegetation Communities
Cropland
Developed
Fremont cottonwood forest and woodland
Gum plant patches
Open water
Ornamental
Perennial pepper weed patches
Perennial rye grass fields
Water primrose wetlands
Wild oats and annual brome grasslands

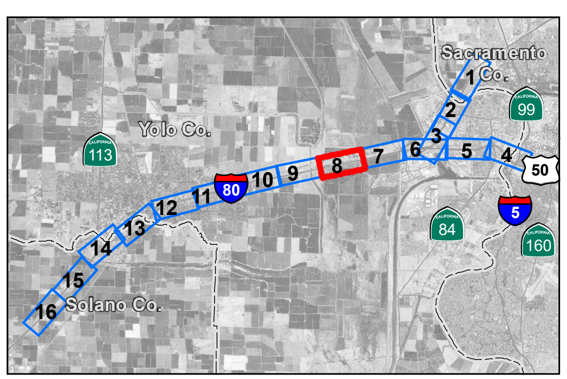
Impacts to Sensitive Natural Communities

CWHR Community Type	CDFW Sensitive Natural Community	Temporary Impact (Acres)	Permanent Impact (Acres)
Valley Foothill Riparian	Oregon ash groves	1.87	0
	CA Sycamore Woodlands		
	Freemont Cottonwood Forest and Woodland		
Valley Oak Woodland	Valley Oak Woodland and Forest	0.51	0.14
Annual/Perennial Grassland	Gum Plant Patches	0.007	0
	Total	2.387	0.14

0 1,000
Feet

Caltrans

Figure 2.3-1
Impacts to Vegetation Communities
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California



ESL (1,147.22 acres)

Post Mile

Vegetation Communities

- Cocklebur patches
- Cropland
- Developed
- Goodding's willow riparian woodland and forest
- Open water
- Perennial pepper weed patches
- Perennial rye grass fields
- Water primrose wetlands

Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2022
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Impacts to Sensitive Natural Communities

CWHR Community Type	CDFW Sensitive Natural Community	Temporary Impact (Acres)	Permanent Impact (Acres)
Valley Foothill Riparian	Oregon ash groves CA Sycamore Woodlands Freemont Cottonwood Forest and Woodland	1.87	0
Valley Oak Woodland	Valley Oak Woodland and Forest	0.51	0.14
Annual/Perennial Grassland	Gum Plant Patches	0.007	0
	Total	**2.387**	**0.14**

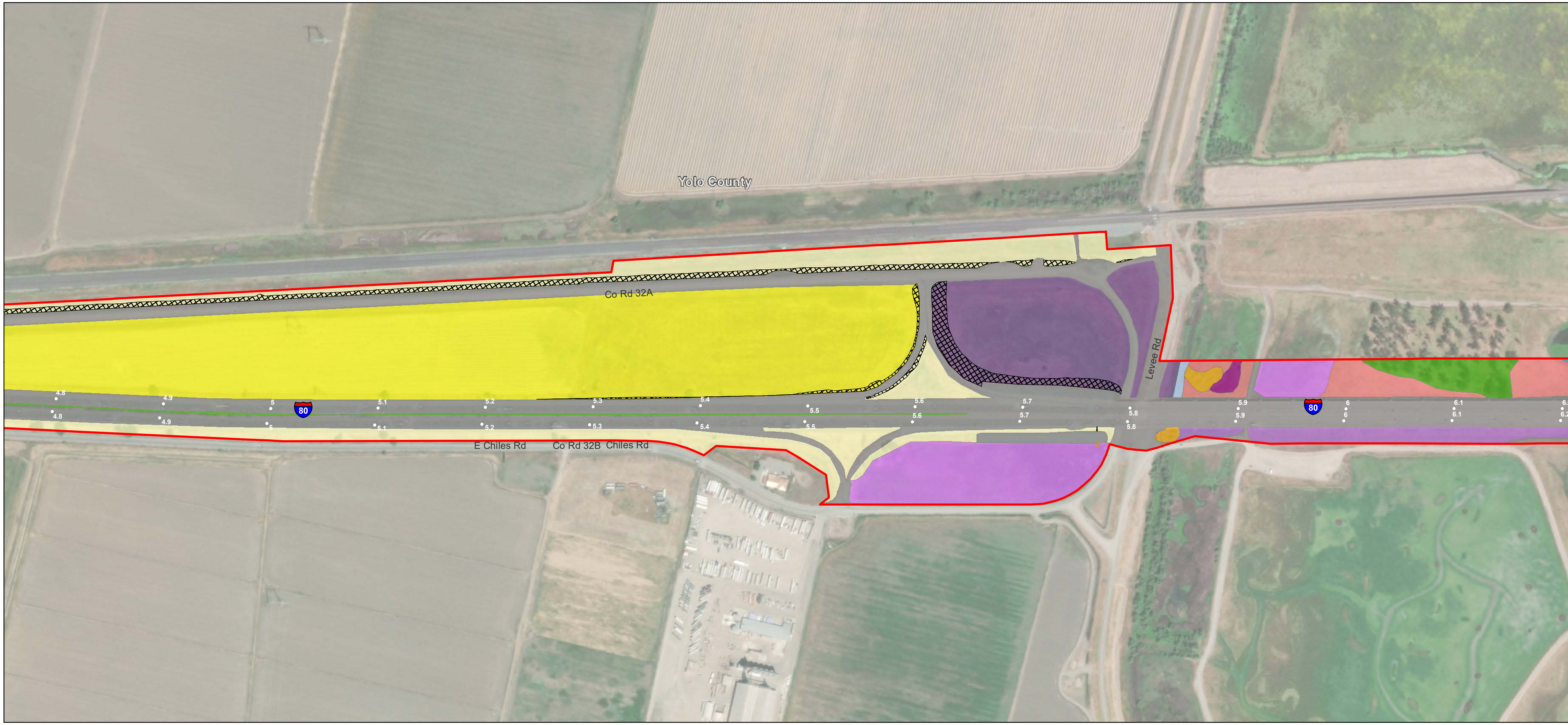
0 1,000
Feet

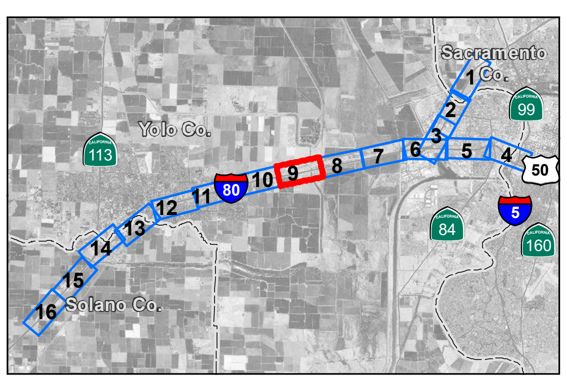
N

Caltrans

Figure 2.3-1
Impacts to Vegetation Communities
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\bio\Fig_2.3-1_DED_VegCommunity\Impacts.mxd Revised: 2022-12-06 By: pglendening





Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2022
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

ESL (1,147.22 acres)
Post Mile

Impacts to Vegetation Communities
Permanent Impact
Temporary Impact

Vegetation Communities
Cocklebur patches
Cropland
Developed
Goodding's willow riparian woodland and forest
Gum plant patches
Hardstem bulrush marshes
Open water
Ornamental
Perennial pepper weed patches
Perennial rye grass fields
Upland mustards or star-thistle fields
Wild oats and annual brome grasslands

Impacts to Sensitive Natural Communities

CWHR Community Type	CDFW Sensitive Natural Community	Temporary Impact (Acres)	Permanent Impact (Acres)
Valley Foothill Riparian	Oregon ash groves; CA Sycamore Woodlands; Freemont Cottonwood Forest and Woodland	1.87	0
Valley Oak Woodland	Valley Oak Woodland and Forest	0.51	0.14
Annual/Perennial Grassland	Gum Plant Patches	0.007	0
	Total	2.387	0.14

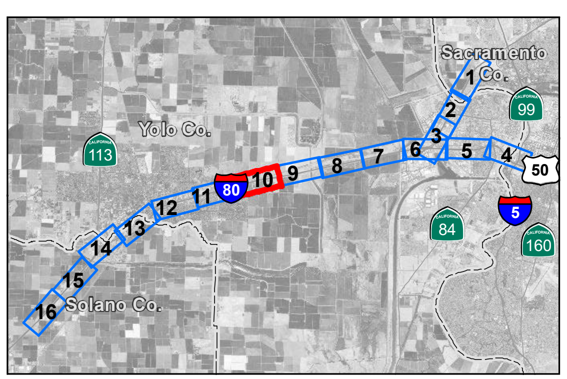
N
0 1,000
Feet

Caltrans

Figure 2.3-1
Impacts to Vegetation Communities
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

Sheet 9 of 16

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\bio\Fig_2.3-1_DED_VegCommunity\Impacts.mxd Revised: 2022-12-06 By: pglendening



ESL (1,147.22 acres)
Post Mile

Impacts to Vegetation Communities
- Permanent Impact
- Temporary Impact
- Temporary Impact (Alternatives 7a and 7b only)*

Vegetation Communities
- Cropland
- Developed
- Ornamental
- Wild oats and annual brome grasslands

Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2022
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Impacts to Sensitive Natural Communities

CWHR Community Type	CDFW Sensitive Natural Community	Temporary Impact (Acres)	Permanent Impact (Acres)
Valley Foothill Riparian	Oregon ash groves CA Sycamore Woodlands Freemont Cottonwood Forest and Woodland	1.87	0
Valley Oak Woodland	Valley Oak Woodland and Forest	0.51	0.14
Annual/Perennial Grassland	Gum Plant Patches	0.007	0
	Total	2.387	0.14

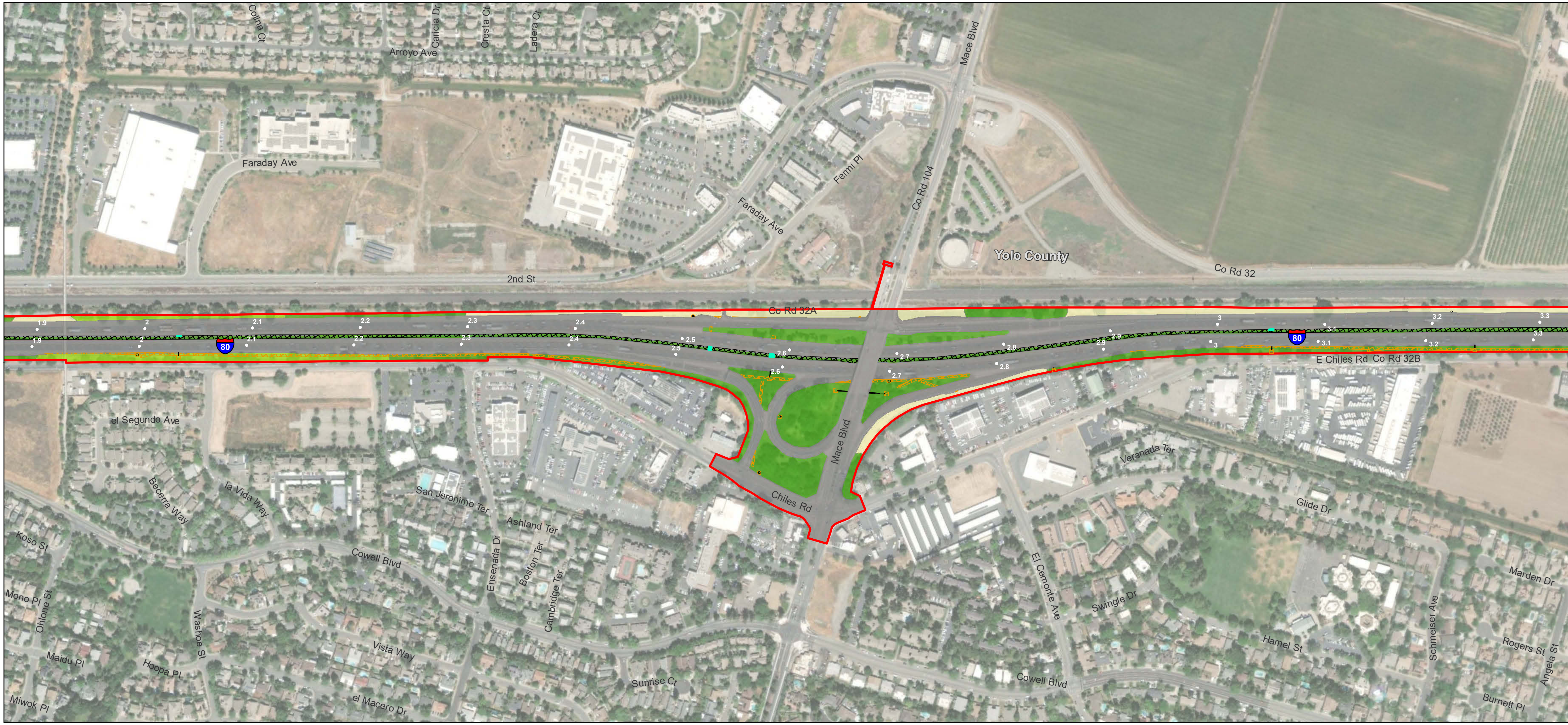
*** Note:** Alternatives 7a and 7b do not include median widening. Where temporary impact is noted in the median (pp 10-12) it is the result of proposed culvert work for Alternatives 7a and 7b. The same locations are permanently impacted by median widening proposed for Alternatives 2, 3, 4, 5, and 6.

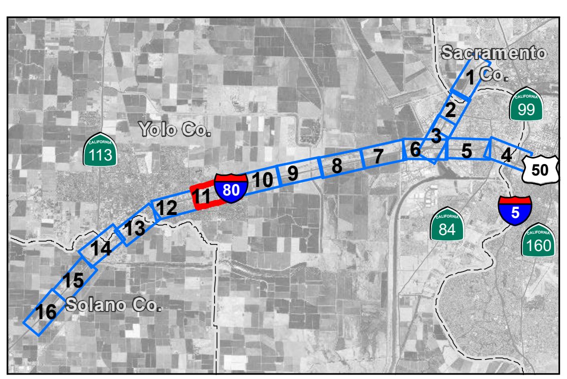
0 1,000
Feet

Caltrans

Figure 2.3-1
Impacts to Vegetation Communities
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\bio\Fig_2.3-1_DED_VegCommunity\Impacts.mxd Revised: 2022-12-06 By: pglendening





Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2022
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

ESL (1,147.22 acres)
Post Mile

Impacts to Vegetation Communities
Permanent Impact
Temporary Impact
Temporary Impact (Alternatives 7a and 7b only)*

Vegetation Communities
Coast live oak woodland and forest
Developed
Ornamental
Wild oats and annual brome grasslands

Impacts to Sensitive Natural Communities

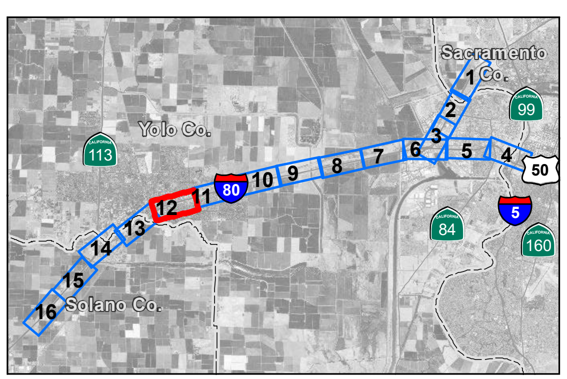
CWHR Community Type	CDFW Sensitive Natural Community	Temporary Impact (Acres)	Permanent Impact (Acres)
Valley Foothill Riparian	Oregon ash groves CA Sycamore Woodlands Freemont Cottonwood Forest and Woodland	1.87	0
Valley Oak Woodland	Valley Oak Woodland and Forest	0.51	0.14
Annual/Perennial Grassland	Gum Plant Patches	0.007	0
	Total	2.387	0.14

*** Note:** Alternatives 7a and 7b do not include median widening. Where temporary impact is noted in the median (pp 10-12) it is the result of proposed culvert work for Alternatives 7a and 7b. The same locations are permanently impacted by median widening proposed for Alternatives 2, 3, 4, 5, and 6.

N
0 1,000
Feet

Caltrans

Figure 2.3-1
Impacts to Vegetation Communities
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California



ESL (1,147.22 acres)

Post Mile

Impacts to Vegetation Communities

Permanent Impact

Temporary Impact

Temporary Impact (Alternatives 7a and 7b only)*

Vegetation Communities

Developed

Ornamental

Wild oats and annual brome grasslands

Notes

1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2022
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Impacts to Sensitive Natural Communities

CWHR Community Type	CDFW Sensitive Natural Community	Temporary Impact (Acres)	Permanent Impact (Acres)
Valley Foothill Riparian	Oregon ash groves; CA Sycamore Woodlands; Freemont Cottonwood Forest and Woodland	1.87	0
Valley Oak Woodland	Valley Oak Woodland and Forest	0.51	0.14
Annual/Perennial Grassland	Gum Plant Patches	0.007	0
	Total	**2.387**	**0.14**

*** Note:** Alternatives 7a and 7b do not include median widening. Where temporary impact is noted in the median (pp 10-12) it is the result of proposed culvert work for Alternatives 7a and 7b. The same locations are permanently impacted by median widening proposed for Alternatives 2, 3, 4, 5, and 6.

N

0 1,000

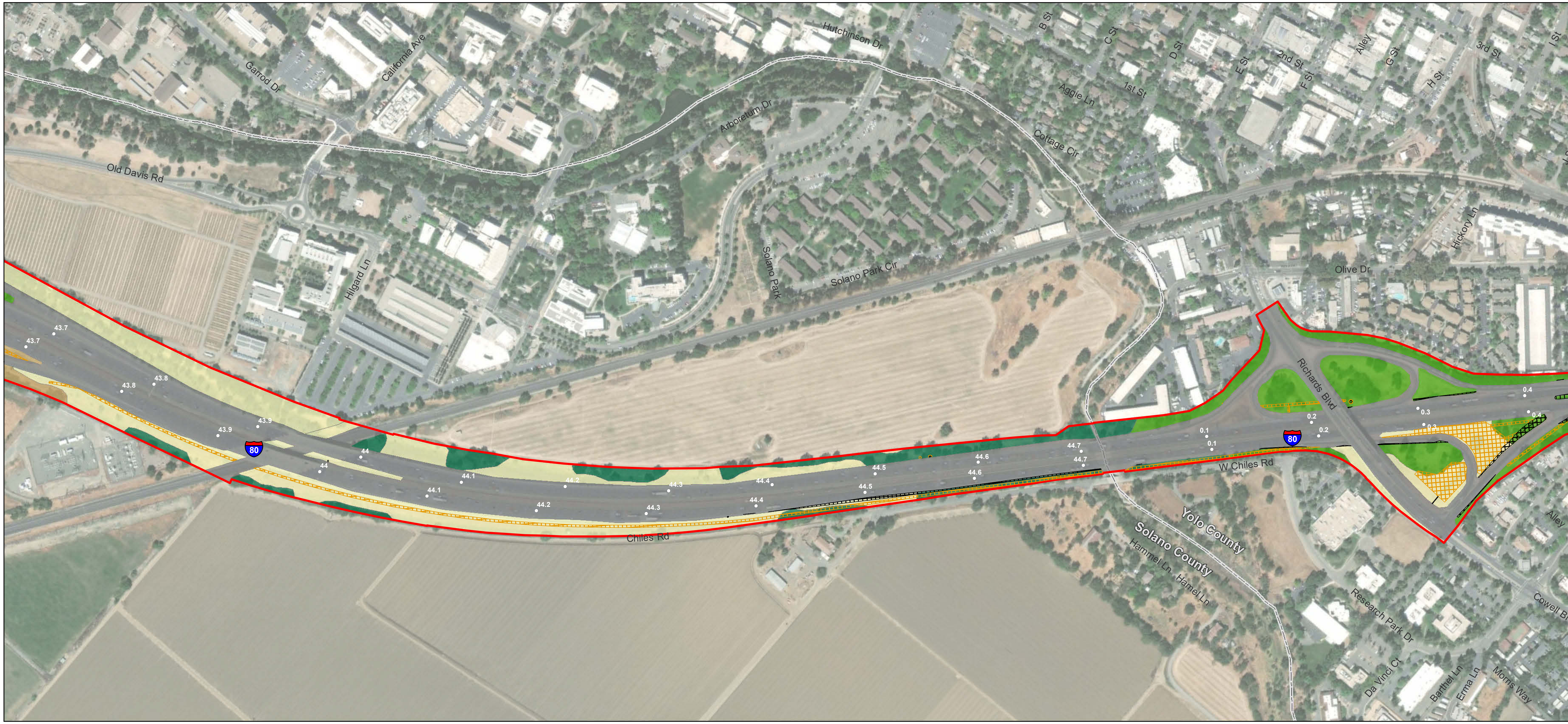
Feet

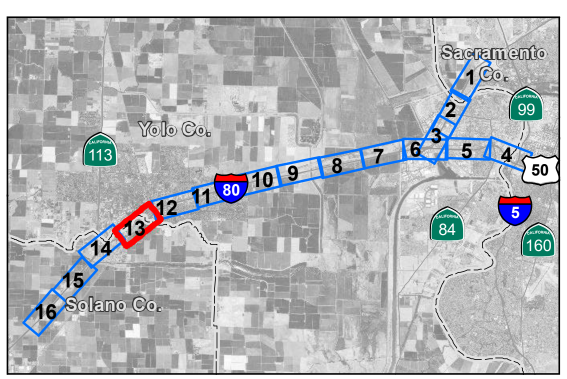
Caltrans

Figure 2.3-1
Impacts to Vegetation Communities
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

Sheet 12 of 16

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\bio\Fig_2.3-1_DED_VegCommunityImpacts.mxd Revised: 2022-12-06 By: pglendening





Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2022
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

ESL (1,147.22 acres)
Post Mile
County Line

Impacts to Vegetation Communities
Permanent Impact
Temporary Impact

Vegetation Communities
California sycamore woodlands
Developed
Ornamental
Valley oak woodland and forest
Wild oats and annual brome grasslands

Impacts to Sensitive Natural Communities

CWHR Community Type	CDFW Sensitive Natural Community	Temporary Impact (Acres)	Permanent Impact (Acres)
Valley Foothill Riparian	Oregon ash groves CA Sycamore Woodlands Freemont Cottonwood Forest and Woodland	1.87	0
Valley Oak Woodland	Valley Oak Woodland and Forest	0.51	0.14
Annual/Perennial Grassland	Gum Plant Patches	0.007	0
	Total	**2.387**	**0.14**

*** Note:** Alternatives 7a and 7b do not include median widening. Where temporary impact is noted in the median (pp 10-12) it is the result of proposed culvert work for Alternatives 7a and 7b. The same locations are permanently impacted by median widening proposed for Alternatives 2, 3, 4, 5, and 6.

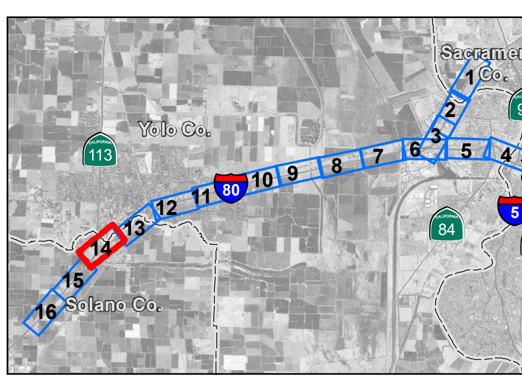
N

0 1,000
Feet

Caltrans

Figure 2.3-1
Impacts to Vegetation Communities
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\bio\Fig_2.3-1_DED_VegCommunity\Impacts.mxd Revised: 2022-12-06 By: pglendening



Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2022
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

ESL (1,147.22 acres)
Post Mile
County Line

Impacts to Vegetation Communities
Permanent Impact
Temporary Impact

Vegetation Communities
California sycamore woodlands
Coast live oak woodland and forest
Cocklebur patches
Developed
Fremont cottonwood forest and woodland
Interior live oak woodland and forest
Open water
Oregon ash groves
Ornamental
Valley oak woodland and forest
Wild oats and annual brome grasslands

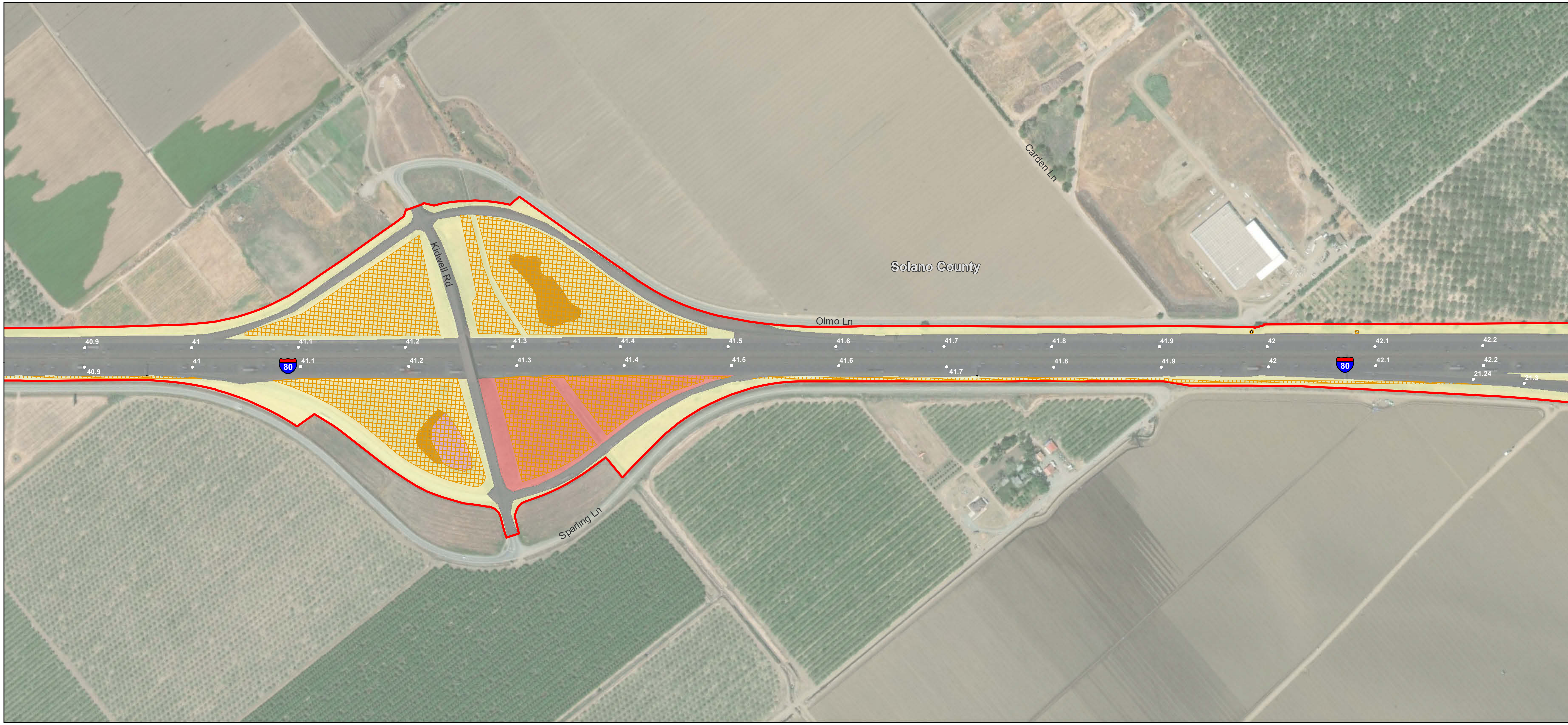
Impacts to Sensitive Natural Communities

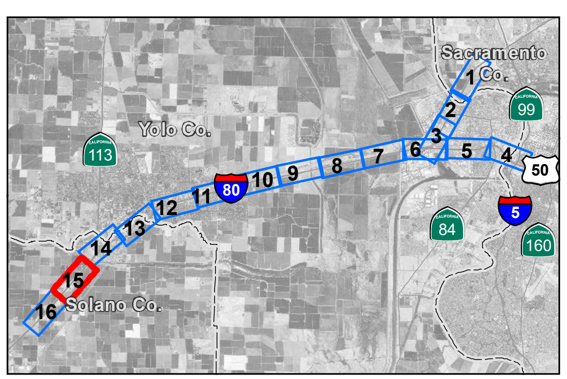
CWHR Community Type	CDFW Sensitive Natural Community	Temporary Impact (Acres)	Permanent Impact (Acres)
Valley Foothill Riparian	Oregon ash groves CA Sycamore Woodlands Freemont Cottonwood Forest and Woodland	1.87	0
Valley Oak Woodland	Valley Oak Woodland and Forest	0.51	0.14
Annual/Perennial Grassland	Gum Plant Patches	0.007	0
	Total	**2.387**	**0.14**

0 1,000
Feet

Figure 2.3-1
Impacts to Vegetation Communities
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\bio\Fig_2.3-1_DED_VegCommunity\Impacts.mxd Revised: 2022-12-06 By: pglendening





Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2022
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

ESL (1,147.22 acres)
Post Mile

Impacts to Vegetation Communities
Permanent Impact
Temporary Impact

Vegetation Communities
Developed
Fremont cottonwood forest and woodland
Perennial pepper weed patches
Sandbar willow thickets
Wild oats and annual brome grasslands

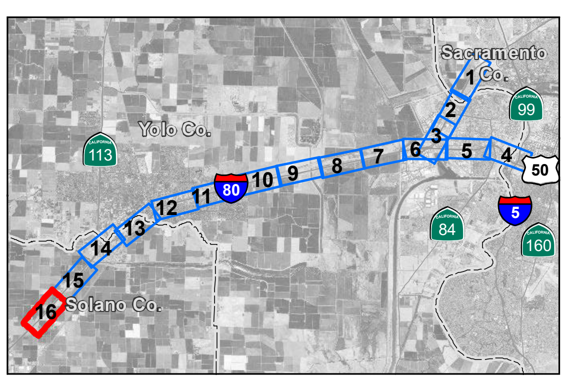
Impacts to Sensitive Natural Communities

CWHR Community Type	CDFW Sensitive Natural Community	Temporary Impact (Acres)	Permanent Impact (Acres)
Valley Foothill Riparian	Oregon ash groves CA Sycamore Woodlands Freemont Cottonwood Forest and Woodland	1.87	0
Valley Oak Woodland	Valley Oak Woodland and Forest	0.51	0.14
Annual/Perennial Grassland	Gum Plant Patches	0.007	0
	Total	**2.387**	**0.14**

0 1,000
Feet

Figure 2.3-1
Impacts to Vegetation Communities
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

Sheet 15 of 16



ESL (1,147.22 acres)

Post Mile

Impacts to Vegetation Communities

Temporary Impact

Vegetation Communities

Developed

Salt grass flats

Valley oak woodland and forest

Wild oats and annual brome grasslands

Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2022
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Impacts to Sensitive Natural Communities

CWHR Community Type	CDFW Sensitive Natural Community	Temporary Impact (Acres)	Permanent Impact (Acres)
Valley Foothill Riparian	Oregon ash groves	1.87	0
	CA Sycamore Woodlands		
	Freemont Cottonwood Forest and Woodland		
Valley Oak Woodland	Valley Oak Woodland and Forest	0.51	0.14
Annual/Perennial Grassland	Gum Plant Patches	0.007	0
	Total	2.387	0.14

0 1,000
Feet

Caltrans

Figure 2.3-1
Impacts to Vegetation Communities
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\bio\Fig_2.3-1_DED_VegCommunity\Impacts.mxd Revised: 2022-12-06 By: pglendening

Table 2.3-1. Vegetation Communities in the Biological Study Area

CWHR Habitat	MCV Vegetation Alliance	Acres of BSA	Percent of BSA
Developed	N/A	595.93	51.9%
Ornamental	N/A	89.36	7.8%
Cropland	N/A	61.44	5.4%
Annual Grassland	Wild oats and annual brome grasslands	224.76	19.59%
	Upland mustards or star thistle fields	12.59	1.1%
	Cocklebur patches	6.69	<1%
	Gum plant patches	17.28	1.5%
Perennial Grassland	Perennial rye grass fields	11.50	1%
	Perennial pepper weed patches	74.06	6.5%
Coastal Oak Woodland	Coast live oak woodland and forest	2.36	<1%
Interior Live Oak	Interior live oak woodland and forest	1.16	<1%
Valley Oak Woodland	Valley oak woodland and forest	21.88	1.9%
Valley Foothill Riparian	Oregon ash groves	0.60	<1%
	California sycamore woodlands	8.59	<1%
	Fremont cottonwood forest and woodland	4.72	<1%
	Gooding's willow riparian woodland and forest	1.43	<1%
	Sandbar willow thickets	1.51	<1%
Saline Emergent Wetland	Salt grass flats	0.58	<1%
Fresh Emergent Wetland	Hardstem bulrush marshes	0.16	<1%
	Water primrose wetlands	4.82	<1%
Open Water	N/A	5.96	<1%

Source: Caltrans District 3 Yolo Corridor Improvement Project Natural Environment Study. (Caltrans. 2022f)
Note: BSA – Biological Study Area, CWHR - California Wildlife Habitat Relationships, MCV – Manual of California Vegetation

Developed

Developed areas account for more than half (about 596 acres) of the BSA and include highways, on-ramps, off-ramps, frontage roads, commercial areas, and other urbanized areas. Vegetation is absent on the road surface, although sparse opportunistic grasses and forbs are present on the road shoulders.

Ornamental

Ornamental is the most represented vegetation type in the BSA. Within the BSA, non-native ornamental vegetation has been planted as windbreaks near croplands and as landscaping in urban areas. Stands observed include various eucalyptus (*Eucalyptus* spp.), Lombardy poplar (*Populus nigra*), English walnut (*Juglans regia*), Peruvian pepper tree (*Schinus molle*), and Chinese elm (*Ulmus parvifolia*). The MCV includes ornamental vegetation alliances that do not encompass all species encountered in the BSA. For the purposes of this survey, all ornamental stands have been lumped together in one ornamental category.

Cropland

Croplands are present in the Yolo Bypass, where there are rice fields that are regularly flooded. There is also a large hayfield just to the west of Yolo Bypass and adjacent to CR 32A.

Annual Grassland

Annual Grassland is the second largest habitat type in the BSA. It occurs throughout the BSA, along the highway, off-ramps, and shoulders, where it is regularly mowed and/or treated with herbicide. Within the BSA, this habitat type is dominated (greater than 30 percent relative cover) by one of several non-native grass species such as wild oat, soft chess (*Bromus hordeaceus*), or wall barley (*Hordeum murinum*). Other non-native grasses and forbs including ripgut brome (*Bromus diandrus*), perennial pepper weed (*Lepidium latifolium),* and prickly oxtongue (*Helminthotheca echioides*).

Perennial Grassland

Perennial Grassland occurs adjacent to the highway in the Yolo Bypass and is dominated (greater than 50 percent relative cover) by perennial rye grass. Other non-native grasses and forbs, including ripgut brome, soft chess, perennial pepperweed, and prickly oxtongue, are present as well.

Coast Oak Woodland

Coastal oak woodland occurs within the BSA in small, scattered stands to the north along the highway near Davis. These stands appear to have been planted along the highway as a landscaping tree. Coast live oak is dominant with greater than 50 percent relative cover in the tree stratum in association with other ornamental trees. The herbaceous stratum contains non-native grass species such as wild oats.

Valley Oak Woodland

Valley oak woodland occurs intermittently in the BSA, with most occurrences near Davis and also near the Sacramento River. Many stands associated with I-80 have been planted, while some stands in proximity to riparian corridors, such as Putah Creek, appear to be naturally occurring. Valley oak is dominant with greater than 35 percent relative cover and in association with other oak species (*Quercus* sp.) and English walnut at lower cover. The herbaceous stratum is typically dominated by non-native grass species such as wild oats and perennial rye grass (*Festuca perennis*).

Interior Live Oak Woodland

Interior live oak woodland was mapped in one planted stand in the BSA, south of Davis, along the interchange to northbound State Route 113. Interior live oak (*Quercus wislizeni*) is dominant with greater than 50 percent relative cover. The herbaceous stratum is dominated by non-native grass species such as wild oats and perennial rye grass.

Valley Foothill Riparian

Valley foothill riparian occurs in small patches in the BSA, and is typically associated with drainages, particularly in the Yolo Bypass, Prospect Slough, and along the Sacramento River. One isolated stand occurs near Sparling Lane south of Davis, and one is associated with a pond. Fremont cottonwood (*Populus fremontii*) is dominant with greater than 50 percent relative cover and in association with various willows (*Salix* spp.) at low cover, and a sparse herbaceous stratum.

Saline Emergent Wetland

Saline emergent wetland occurs in and adjacent to a shallow roadside ditch that runs adjacent to I-80 in Dixon. This alliance is dominated by salt grass (*Distichlis spicata*) at greater than 70 percent relative cover with other non-native grasses and forbs such as harding grass (*Phalaris aquatica*) and bristly ox tongue. Patchy broadleaf cattail (*Typha latifolia*) and bulrush (*Schoenoplectus acutus*) also are present.

Fresh Emergent Wetland

Fresh Emergent Wetland occurs in a ditch that runs adjacent to I-80 near the east side of the Yolo Bypass and is dominated by hardstem bulrush at greater than 50 percent relative cover. Other emergent species in this feature, such as broadleaf cattail and water primrose, are present as well. Another occurrence of fresh emergent wetland occurs in ditches near Yolo Bypass and in a ditch west of Sacramento. It is dominated almost exclusively by invasive water primrose (*Ludwigia peploides*), which floats on top of the water and persists on the ground surface when water levels drop. Mosquito fern (*Azolla microphylla*), a native species, is also present at less than 10 percent relative cover.

Open Water

Open Water is not a vegetation alliance; but for the purposes of this survey, it is included as unvegetated waterbodies. Within the BSA, this includes the Sacramento River, which is crossed twice by the BSA, the South Fork of Putah Creek, Prospect Slough, agricultural ditches, and a pond in the Yolo Bypass.

Habitat Connectivity

Habitat corridors are segments of land that provide linkages between different habitats while also providing cover. On a broader level, corridors also function as avenues along which wide-ranging animals can travel, plants can propagate, genetic interchange can occur, populations can move in response to environmental changes and natural disasters, and threatened species can relocate from other areas. Habitat corridors often consist of riparian areas along streams, rivers, or other natural features. Additionally, the rivers and streams themselves may serve as migration corridors for anadromous fish. The Sacramento River, Putah Creek, the Yolo Bypass, and the adjacent upland forested communities (e.g., riparian corridors along the Sacramento River and Putah Creek) could provide habitat connectivity within the BSA.

Sensitive Natural Communities

California Department of Fish and Wildlife (CDFW) maintains a list of California Sensitive Natural Communities. Sensitive Natural Communities are classified following the technical approach described in the MCV (Sawyer et al. 2009) and the California Native Plants Society (CNPS) web-based version of the manual, *A Manual of California Vegetation Online* (CNPS 2021). The MCV describes common to rare vegetation types in California and is the authority on vegetation classification for large- to fine-scale vegetation mapping efforts in the state. The current list of California Sensitive Natural Communities (CDFW 2021a) was reviewed to determine whether any Sensitive Natural Communities occur in the BSA.

Seven MCV alliances mapped within the BSA are considered Sensitive Natural Communities by CDFW: Oregon ash groves, California sycamore woodlands, Fremont cottonwood forest and woodland, valley oak woodland and forest, Gooding’s willow riparian woodland and forest, gum plant patches, and hardstem bulrush marshes. These alliances correspond to the valley foothill riparian, valley foothill woodland, fresh emergent wetland, and annual/perennial grassland CWHR communities described in the Vegetation Communities section above. Table 2.3-2 provides a crosswalk for how these alliances correspond to the CWHR communities.

Table 2.3-2. California Department of Fish and Wildlife Sensitive Natural Community to California Wildlife Habitat Relationships Community Crosswalk

CWHR Community Type	CDFW Sensitive Natural Community
Annual/perennial grassland	Gum plant patches
Fresh emergent wetlands	Hardstem bulrush marshes
Valley foothill riparian	Oregon ash groves California sycamore woodlands Fremont cottonwood forest and woodland Gooding’s willow riparian woodland and forest
Valley oak woodland	Valley oak woodland and forest

Source: Caltrans District 3 Yolo Corridor Improvement Project Natural Environment Study. (Caltrans. 2022f)
Note: CWHR - California Wildlife Habitat Relationships; CDFW – California Department of Fish and Wildlife

Riparian Habitat

Riparian habitat is considered a sensitive natural community by USACE, Regional Water Quality Control Board (RWQCB), and CDFW, and is present in the BSA. In addition to providing habitat for many wildlife species, riparian areas provide shade, sediment, nutrient or chemical regulation, stream bank stability, and input for large woody debris or organic matter to the channel, which are necessary habitat elements for fish and other aquatic species. Riparian habitat (approximately 15.4 acres) occurs in the vicinity of Putah Creek, Yolo Bypass, and along the Sacramento River at both the I-80 and US-50 crossings in the BSA.

2.3.1.2 Environmental Consequences

No Build Alternative 1

Construction and Operation

No Build Alternative 1 would not result in physical or operational improvements within the BSA. Therefore, No Build Alternative 1 would not affect natural communities of concern.

Build Alternatives 2a and 2b

Construction and Operation

Impacts on CDFW Sensitive Natural Communities would only occur on sensitive natural communities located within the valley foothill riparian and valley foothill woodland CWHR communities. Temporary and permanent impacts, as a result of Build Alternatives 2a and 2b, on CDFW Sensitive Natural Communities and the riparian communities considered sensitive by USACE and RWQCB are summarized in Table 2.3-3. Table 2.3-3 summarizes potential impacts within Sensitive Natural Communities. Standard Measures BIO-1, BIO-3, and BIO-4 (see Appendix E) would be implemented and require contractor briefings, invasive non-native species control, pre-construction surveys for sensitive plant species, etc. Temporary impacts would result from the staging areas, and installation of the fiber optic line. Permanent impacts would result from the permanent footprint of the roadway expansion. In addition, indirect impacts could result from the introduction and spread of non-native invasive plants, which would degrade the quality of habitat or change the vegetation composition and structure. Further, with incorporation of Standard Measures BIO-1, BIO-3, and BIO-4, this impact would not result in adverse impacts to Sensitive Natural Communities.

Table 2.3-3. Summary of Sensitive Natural Community Approximate Impacts within the Biological Study Area

CWHR Community Type	CDFW Sensitive Natural Community	Temporary Impact (Acres)	Permanent Impact (Acres)
Valley Foothill Riparian	Oregon ash groves California sycamore woodlands Fremont cottonwood forest and woodland	1.87	-
Valley Oak Woodland	Valley oak woodland and forest	0.51	0.14
Annual/Perennial Grassland	Gum plant patches	0.007	
Total		**2.39**	**0.14**

Source: Caltrans District 3 Yolo Corridor Improvement Project Natural Environment Study. (Caltrans. 2022f)
Note: CWHR - California Wildlife Habitat Relationships; CDFW – California Department of Fish and Wildlife

Build Alternatives 3a and 3b

Construction and Operation

Build Alternatives 3a and 3b would involve adding an HOT2+ lane in each direction. Build Alternatives 3a and 3a propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively; therefore, the temporary and permanent effects would be the same as the temporary and permanent effects described under Build Alternatives 2a and 2b.

Build Alternatives 4a and 4b

Construction and Operation

Build Alternatives 4a and 4b would involve adding an HOT3+ lane in each direction. Build Alternatives 4a and 4b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively; therefore, the temporary and permanent effects would be the same as the temporary and permanent effects described under Build Alternatives 2a and 2b.

Build Alternatives 5a and 5b

Construction and Operation

Build Alternatives 4a and 4b would involve adding an HOT3+ lane in each direction. Build Alternatives 4a and 4b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively; therefore, the temporary and permanent effects would be the same as the temporary and permanent effects described under Build Alternatives 2a and 2b.

Build Alternatives 6a and 6b

Construction and Operation

Build Alternatives 6a and 6b would involve adding a transit-only lane in each direction. Build Alternatives 6a and 6b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively; therefore, the effects temporary and permanent would be the same as the temporary and permanent effects described under Build Alternatives 2a and 2b.

Build Alternatives 7a and 7b

Construction and Operation

Build Alternatives 7a and 7b would involve repurposing the current number 1 general purpose lane to HOV 2+. No new lanes would be constructed. Build Alternatives 7a and 7b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively; therefore, the temporary and permanent effects would be the same as the temporary and permanent effects described under Build Alternatives 2a and 2b.

2.3.1.3 Avoidance, Minimization, and/or Mitigation Measures

Caltrans would implement Standard Measures BIO-1, BIO-3, and BIO-4 to reduce impacts on Sensitive Natural Communities. No other avoidance and minimization measures are required.

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 that provides that discharge of dredged or fill material cannot be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation’s waters would be significantly degraded.

The Section 404 permit program is run by the U.S. Army Corps of Engineers (USACE) with oversight by the U.S. Environmental Protection Agency (U.S. EPA).

The USACE issues two types of 404 permits: General and Individual. There are two types of General permits: Regional and Nationwide. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to allow a variety of minor project activities with no more than minimal effects.

Ordinarily, projects that do not meet the criteria for a Regional or Nationwide Permit may be permitted under one of 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 the USACE, and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The Guidelines state that the USACE may not issue a permit if there is a "least environmentally damaging practicable alternative" (LEDPA) to the proposed discharge that would have lesser effects on waters of the U.S., and not have any other significant adverse environmental consequences.

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 Federal Highway Administration (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 (RWQCBs) 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 jurisdiction of the USACE may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the CDFW.

The RWQCBs were established under the Porter-Cologne Water Quality Control Act to oversee water quality. Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements (WDRs) 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 the Water Quality section for more details.

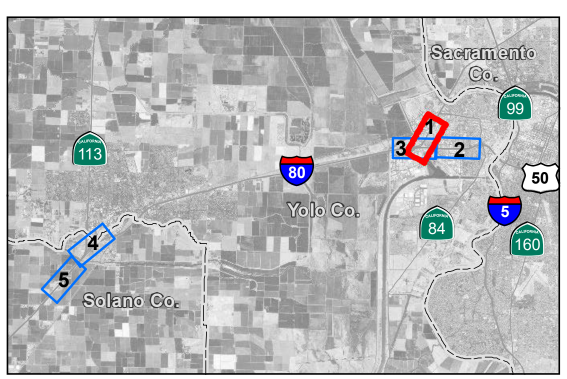
2.3.2.2 Affected Environment

On December 18, 21, 22, 28, and 29, 2020, February 19 and 20–24, 2021, and July 21, 2022, a delineation of aquatic resources subject to agency jurisdiction (i.e., USACE, RWQCB, CDFW) was conducted. Waters of the United States were delineated according to methodology described in the Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987) and the Regional Supplement to the Corps Wetland Delineation Manual: Arid West Region (USACE 2008). Waters of the state were delineated in accord with the definitions and methods described in the Porter-Cologne Water Quality Control Act and the SWRCB's *Implementation Guidance for the State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* (SWRCB 2020).

A total of 29.013 acres (8,671.87 linear feet) of aquatic resources potentially subject to agency jurisdiction (i.e., waters of the United States or waters of the state) were identified in the BSA. These features include perennial drainage (5.692 acres; 1,148.01 linear feet), intermittent drainage (0.741 acre; 2,734.89 linear feet), ephemeral drainage (0.461 acre; 1,654.61 linear feet), fresh emergent wetland (0.399 acre), woody riparian wetland (5.058 acres), seasonal wetland (4.002 acres), vegetated ditch (7.553 acres), canal (1.523 acres; 3,134.36 linear feet), and pond (3.584 acres). These features are listed in Table 2.3-4 and shown in Figure 2.3-2.

Table 2.3-4. Summary of Aquatic Resources within the BSA

Feature Type	Acres	Linear Feet
Wetlands		
Fresh Emergent Marsh	0.399	N/A
Seasonal Wetlands	4.002	N/A
Vegetated Ditches	7.553	N/A
Woody Riparian Wetlands	5.058	N/A
Wetlands Total	**17.012**	N/A
Other Waters		
Ephemeral Drainages	0.461	1,654.61
Intermittent Drainages	0.741	2,734.89
Perennial Drainages	5.692	1,148.01
Canals	1.523	3,134.36
Ponds	3.584	N/A
Other Waters Total	**12.001**	**8,671.87**
Total	**29.013**	**8,671.87**



- Environmental Study Limit (1,147.22 acres)
- Connector Ramp and Associated Cut-Fill (Alternatives 2b-7b)

Aquatic Resources
- Canal
- Drainage
- Canal
- Vegetated Ditch

Project Impacts
- Permanent Impact
- Temporary Impact

Impacted Aquatic Resources
- Permanent
- Temporary

Impacted Linear Aquatic Resources
- Temporary

0 1,000
Feet

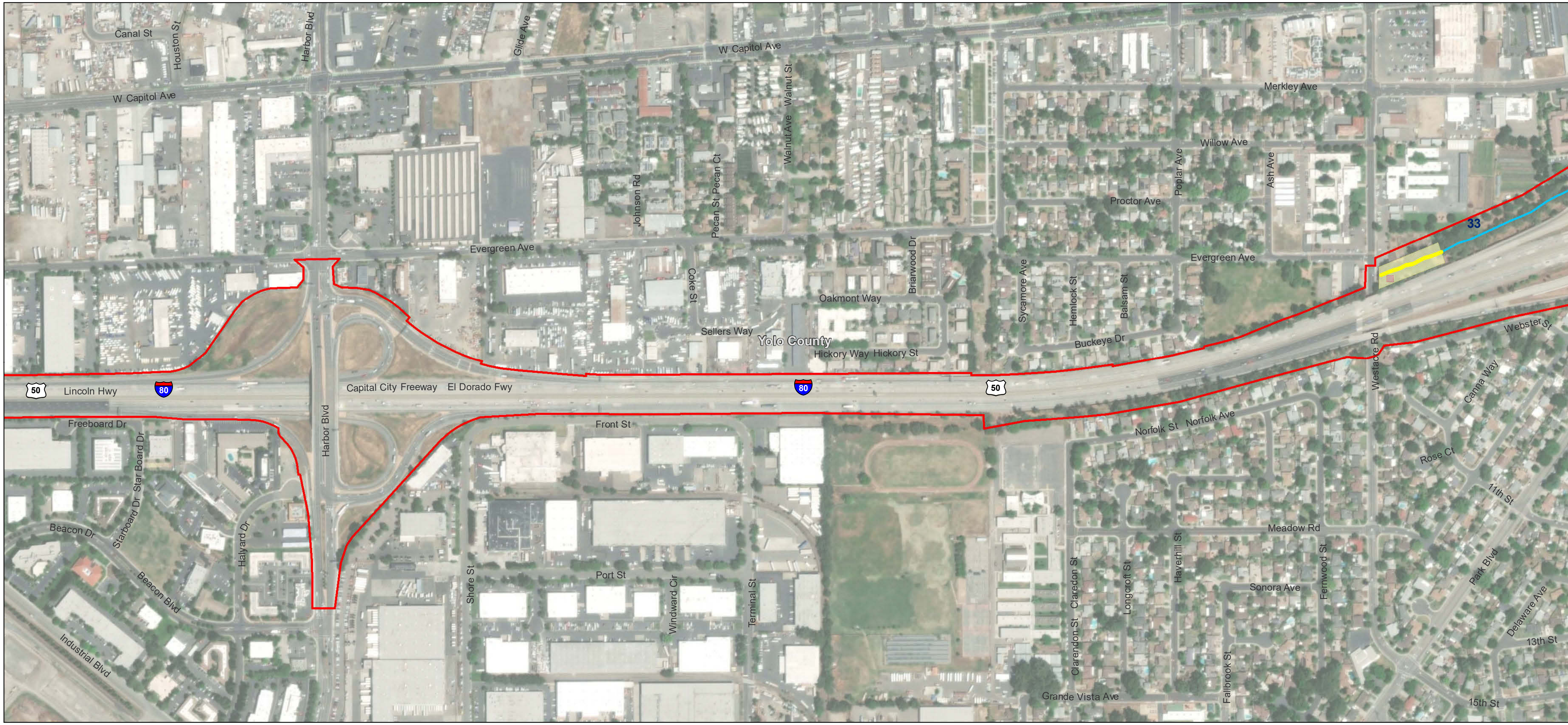
Feature ID	Feature Type	Impact (acres) Permanent	Impact (acres) Temporary	Impact (linear feet) Permanent	Impact (linear feet) Temporary
Wetlands					
07	Woody Riparian Wetland	--	0.002	--	--
Other Waters					
04	Canal	--	<0.001	--	3.03
06	Perennial Drainage	--	0.005	--	12.67
31	Canal	--	0.028	--	42.59
33	Ephemeral Drainage	0.022	--	315.57	--
46	Pond	--	0.084	--	--

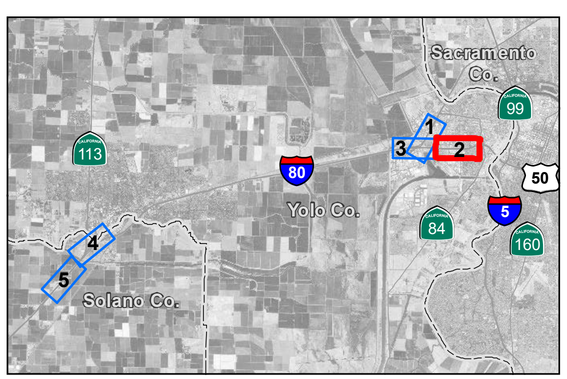
Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2021
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Figure 2.3-2
Potential Impacts on Aquatic Resources
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

Sheet 1 of 5

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\bio\Fig_2.3-2_DED_Aquatic_impacts.mxd Revised: 2023-03-21 By: pglendening





Environmental Study Limit (1,147.22 acres)

Connector Ramp and Associated Cut-Fill (Alternatives 2b-7b)

Aquatic Resources

Canal

Drainage

Project Impacts

Permanent Impact

Temporary Impact

Impacted Aquatic Resources

Permanent

Temporary

Impacted Linear Aquatic Resources

Temporary

N

0 1,000

Feet

Caltrans

Feature ID	Feature Type	Impact (acres) Permanent	Impact (acres) Temporary	Impact (linear feet) Permanent	Impact (linear feet) Temporary
Wetlands					
07	Woody Riparian Wetland	--	0.002	--	--
Other Waters					
04	Canal	--	<0.001	--	3.03
06	Perennial Drainage	--	0.005	--	12.67
31	Canal	--	0.028	--	42.59
33	Ephemeral Drainage	0.022	--	315.57	--
46	Pond	--	0.084	--	--

Notes

1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2021
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Figure 2.3-2

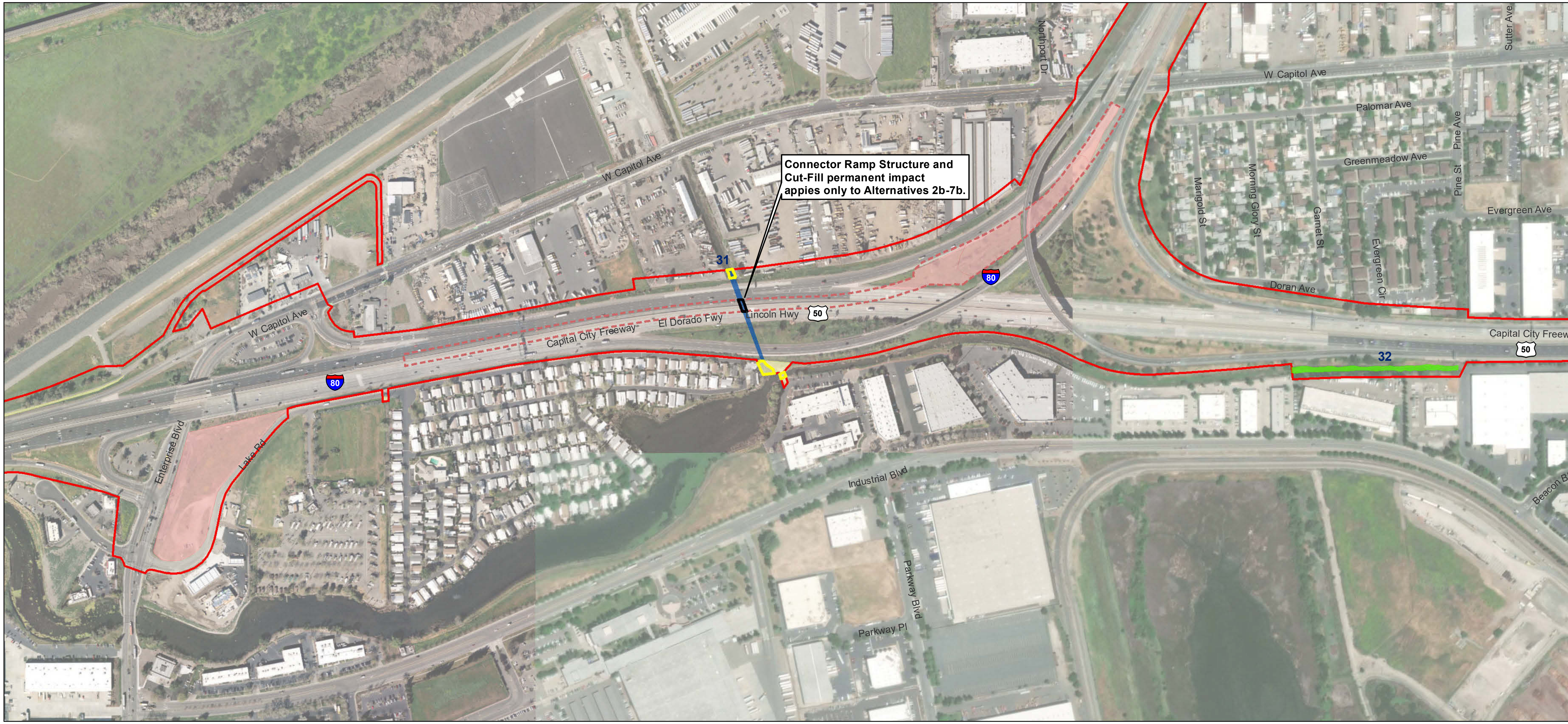
Potential Impacts on Aquatic Resources

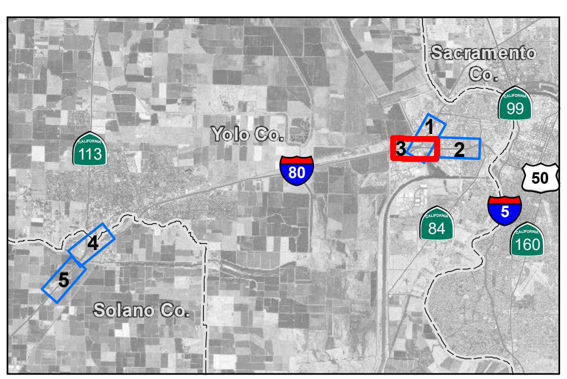
Yolo 80 Corridor Improvement Project

EA 03-3H900

Solano, Yolo, and Sacramento Counties, California

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\bio\Fig_2.3-2_DED_Aquatic_impacts.mxd Revised: 2023-03-21 By: pglendening





Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2021
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Environmental Study Limit (1,147.22 acres)
Connector Ramp and Associated Cut-Fill (Alternatives 2b-7b)

Aquatic Resources
Canal
Drainage
Canal
Vegetated Ditch

Project Impacts
Permanent Impact
Temporary Impact

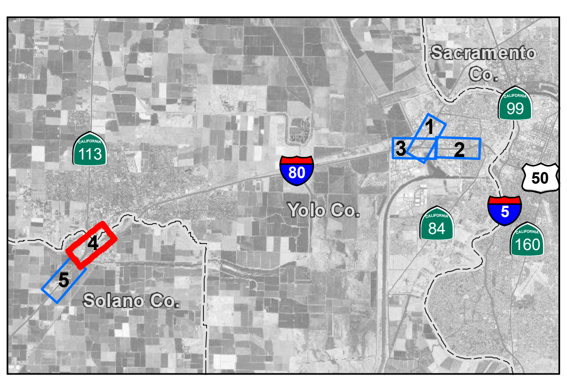
Impacted Aquatic Resources
Permanent
Temporary

Impacted Linear Aquatic Resources
Temporary

Feature ID	Feature Type	Impact (acres)		Impact (linear feet)	
		Permanent	Temporary	Permanent	Temporary
Wetlands					
07	Woody Riparian Wetland	--	0.002	--	--
Other Waters					
04	Canal	--	<0.001	--	3.03
06	Perennial Drainage	--	0.005	--	12.67
31	Canal	--	0.028	--	42.59
33	Ephemeral Drainage	0.022	--	315.57	--
46	Pond	--	0.084	--	--

0 1,000
Feet

Figure 2.3-2
Potential Impacts on Aquatic Resources
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California



Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2021
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Environmental Study Limit (1,147.22 acres)
Connector Ramp and Associated Cut-Fill (Alternatives 2b-7b)

Aquatic Resources
- Canal
- Drainage
- Perennial Drainage
- Woody Riparian Wetland
- Seasonal Wetland

Project Impacts
- Permanent Impact
- Temporary Impact

Impacted Aquatic Resources
- Permanent
- Temporary

Impacted Linear Aquatic Resources
- Temporary

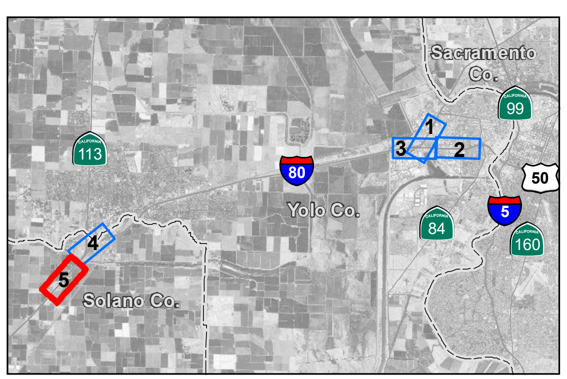
Feature ID	Feature Type	Impact (acres)		Impact (linear feet)	
		Permanent	Temporary	Permanent	Temporary
Wetlands					
07	Woody Riparian Wetland	--	0.002	--	--
Other Waters					
04	Canal	--	<0.001	--	3.03
06	Perennial Drainage	--	0.005	--	12.67
31	Canal	--	0.028	--	42.59
33	Ephemeral Drainage	0.022	--	315.57	--
46	Pond	--	0.084	--	--

N

0 — 1,000
Feet

Caltrans

Figure 2.3-2
Potential Impacts on Aquatic Resources
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California



Environmental Study Limit (1,147.22 acres)

Connector Ramp and Associated Cut-Fill (Alternatives 2b-7b)

Aquatic Resources

Canal

Drainage

Project Impacts

Permanent Impact

Temporary Impact

Impacted Aquatic Resources

Permanent

Temporary

Impacted Linear Aquatic Resources

Temporary

Feature ID	Feature Type	Impact (acres) Permanent	Impact (acres) Temporary	Impact (linear feet) Permanent	Impact (linear feet) Temporary
Wetlands					
07	Woody Riparian Wetland	--	0.002	--	--
Other Waters					
04	Canal	--	<0.001	--	3.03
06	Perennial Drainage	--	0.005	--	12.67
31	Canal	--	0.028	--	42.59
33	Ephemeral Drainage	0.022	--	315.57	--
46	Pond	--	0.084	--	--

N

0 1,000

Feet

Caltrans

Notes
1. Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
2. Data Sources: CalTrans, Stantec, 2021
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Figure 2.3-2
Potential Impacts on Aquatic Resources
Yolo 80 Corridor Improvement Project
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

V:\1857\Active\185733022_CT80Yolo\03_data\gis_cad\gis\mxd\bio\Fig_2.3-2_DED_Aquatic_impacts.mxd Revised: 2023-03-21 By: pglendening

A total of three fresh emergent marsh wetlands were mapped within the Yolo Bypass portion of the BSA. Vegetation was dominated by obligate perennial species such as water primrose, broad-leaved cattail, and tule (*Schoenoplectus acutus* var. *occidentalis*).

Eleven woody riparian wetlands were mapped intermittently throughout the BSA, particularly in the Yolo Bypass and along the Sacramento River. Woody riparian wetlands exhibit signs of frequent ponding and/or flooding for long duration or very long duration during the growing season and were dominated by woody deciduous shrubs and trees, including dominant species such as Fremont cottonwood, black willow (*Salix goddingii*), and narrow-leaved willow (*Salix exigua*).

Six seasonal wetlands were mapped in the western portion of the BSA, starting in the Yolo Bypass area and intermittently occurring west toward Dixon. The seasonal wetland exhibited positive field indicators of long duration saturation during the growing season and hydrophytic vegetation characteristic of this wetland type. Dominant species observed in seasonal wetlands include umbrella sedge (*Cyperus eragrostis*), dallis grass (*Paspalum dilatatum*), and perennial ryegrass.

Six vegetated ditches were mapped throughout the BSA. Vegetated ditches generally consist of constructed drainage ditches that exhibit positive indicators for all three wetland parameters. Dominant species observed in the vegetated ditches include broad-leaved cattail, tule, and saltgrass.

Two ephemeral drainages and three intermittent drainages were mapped in the BSA. The two ephemeral drainages are both located in the urban sections adjacent to the Sacramento River. Both drainages are subject to flow from rainfall, are seasonally inundated, and are connected through storm drains to the Sacramento River. The three intermittent drainages and drainage segments were mapped in the BSA in the more urban sections of West Sacramento. All three of the drainage/drainage segments are hydrologically connected to the Yolo Bypass Toe Drain, either directly or indirectly, with a culverted connection.

Perennial drainages in the BSA occur as part of the Sacramento River, which intersects the BSA in two locations, at Prospect Slough as part of the Yolo Bypass and one segment of South Putah Creek. The Sacramento River originates outside the BSA and is fed by the intermittent and ephemeral drainages mapped within the BSA before draining into the Sacramento-San Joaquin Delta. South Putah Creek originates at Lake Berryessa outside the BSA, and it flows east until it drains into the Yolo Bypass and, subsequently, the Sacramento River.

Eight segments of canal were mapped within the BSA. Canal segments are man-made drainages that generally have steep sides and move water away from West Sacramento toward croplands for irrigation.

Three ponds with open water were mapped within the BSA. Two ponds are on the north side of the Yolo Bypass and connect via culvert to a vegetated ditch within the Yolo Bypass. The third is connected to a canal on the south side of I-80. These perennial ponds are open water features that are part of the tributary system connected to the Yolo Bypass.

2.3.2.3 Environmental Consequences

No Build Alternative 1

Construction and Operation

No Build Alternative 1 would make no physical or operational improvements within the BSA. Therefore, No Build Alternative 1 would not affect aquatic resources subject to agency jurisdiction (i.e., waters of the U.S. and waters of the state).

Build Alternatives 2a and 2b

Construction and Operation

Build Alternatives 2a and 2b include roadway improvements such as replacing culverts and installing a fiber optic line and vaults. Indirect impacts on aquatic resources could include the reduction in quality and/or function of the aquatic resources as a result of an incidental release of sediments or chemicals into surface waters, or the introduction or spread of non-native species into water features. Build Alternative 2b also includes construction of the connector structure which would result in permanent impacts on Canal 31. Permanent and temporary direct impacts associated with the proposed improvements on aquatic resources are summarized in Table 2.3-5.

Table 2.3-5. Approximate Impacts on Aquatic Resources – Build Alternatives 2a and 2b

Impacts/ Aquatic Resources	Feature ID	Water Feature	Acres		Linear Feet	
			Alt 2a-7a	Alt 2b-7b	Alt 2a-7a	Alt 2b-7b
Permanent Impacts on Other Waters	31	Canal		0.033		62.41
	33	Ephemeral Drainage	0.022	0.022	315.57	315.57
Total Permanent Impacts	**—**	**—**	**0.022**	**0.055**	**315.57**	**377.98**
Temporary Impacts on Wetlands	07	Woody Riparian Wetland	0.002	0.002	n/a	n/a
Temporary Impacts on Other Waters	06	Perennial Drainage	0.005	0.005	12.67	12.67
	04	Canal	<0.001	<0.001	3.03	3.03
	31	Canal	0.028	0.028	42.59	42.59
	46	Pond	0.084	0.084	n/a	n/a
Total Temporary Impacts	**—**	**—**	**0.12**	**0.12**	**58.296**	**58.29**

Standard Measures BIO-1, BIO-3 and BIO-4 (see Appendix E) would minimize the potential for indirect impacts on sensitive aquatic resources as a result of construction activities associated with the project. Further, with incorporation of AMMs BIO-1, BIO-2, and BIO-3, impacts on aquatic resources would be minimized; and the project would not result in substantial adverse effects to aquatic resources.

Build Alternatives 3a and 3b

Construction and Operation

Build Alternatives 3a and 3b would involve adding an HOT2+ lane in each direction. Build Alternatives 3a and 3a propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively; therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 4a and 4b

Construction and Operation

Build Alternatives 4a and 4b would involve adding an HOT3+ lane in each direction. Build Alternatives 4a and 4b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively; therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 5a and 5b

Construction and Operation

Build Alternatives 4a and 4b would involve adding an HOT3+ lane in each direction. Build Alternatives 4a and 4b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively; therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 6a and 6b

Construction and Operation

Build Alternatives 6a and 6b would involve adding a transit-only lane in each direction. Build Alternatives 6a and 6b propose similar project components within the same project area as Build Alternatives 2a and 2b; therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 7a and 7b

Construction and Operation

Build Alternatives 7a and 7b would involve repurposing the current number 1 general purpose lane to HOV 2+. No new lanes would be constructed. Build Alternatives 7a and 7b propose similar project components within the same project area as Build Alternatives 2a and 2b; therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

2.3.2.4 Avoidance, Minimization, and/or Mitigation Measures

Caltrans would implement the following AMMs to reduce impacts on wetlands and other waters.

- **AMM BIO-1: USACE and RWQCB Permitting.** Before any discharge of dredge or fill material into waters of the United States or waters of the state, the required permits/authorizations will be obtained from USACE and RWQCB. All terms and conditions of the required permits/authorizations will be implemented.
- **AMM BIO-2: CDFW Permitting.** Before beginning any activities that would obstruct the flow of, or alter the bed, channel, or bank of any feature subject to Fish and Game Code Section 1600, notification of streambed alteration will be submitted to CDFW. If required, a Streambed Alteration Agreement will be obtained from CDFW, and all conditions of the agreement will be implemented.
- **AMM BIO-3: Restoration of Aquatic Resources.** Aquatic resources subject to agency jurisdiction that are temporarily affected by project construction will be restored as close as practicable to their original contour and conditions within 10 days of the completion of construction activities.

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

This section addresses the special-status plant species that are documented to have occurred or have the potential to occur in the BSA, based on literature and database searches, and botanical surveys.

A species was determined to have the potential to occur within the BSA if it met at least one of the following criteria:

- Historically occurred within or adjacent to the BSA, as documented in the CDFW Biogeographic Information and Observation System or CNDDB (CDFW 2021b)
- Has a known or expected geographic range within the vicinity of the project area
- Has known or expected habitat present within or near the BSA

Rare Plant Surveys

A protocol-level focused botanical survey and vegetation characterization (see Section 2.3.1 above) was conducted on May 10–14 and 18–20, 2021, and July 14, 2022. The focused botanical survey was conducted to determine viability and potential presence during blooming period for special-status plants with a potential to occur within the BSA. Surveys were performed within the appropriate bloom periods, but no special-status plants were observed during the focused botanical surveys.

Suitable habitat is present within the BSA for 25 special-status plants. However, these species are presumed to be absent in the BSA because they were not observed during the focused botanical surveys (Table 2.3-6).

Table 2.3-6. Special-Status Plants Potentially Occurring or Known to Occur in the Biological Study Area

Common Name	*Scientific Name*	Status[1] (Fed/State/ CRPR)	General Habitat Description	Potential to Occur within the Biological Study Area[2]
depauperate milk-vetch	*Astragalus pauperculus*	—/—/4.3	Found in chaparral, cismontane woodland, and valley and foothill grassland with vernally mesic, volcanic soil. Blooms: March–June Elevation: 200 to 4,000 feet	None. The BSA is not within elevational range of the species. Vernally mesic, volcanic soils are not present within the BSA. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys and is presumed to be absent from the BSA.
Ferris' milk-vetch	*Astragalus tener* var. *ferrisiae*	—/—/1B.1	Found in valley and foothill grassland (subalkaline flats) and meadows and seeps (vernally mesic). Blooms: April–May Elevation: 5 to 245 feet	None. No suitable subalkaline flats within valley and foothill grassland or meadows and seeps are present within the BSA. The most recent CNDDB occurrence is from 1954 at an unknown location along the Yolo Bypass. This species was not observed during the May 2021 botanical surveys and is presumed to be absent from the BSA.
alkali milk-vetch	*Astragalus tener* var. *tener*	—/—/1B.2	Found in playas, valley and foothill grassland (adobe clay), and vernal pools. Blooms: March–June Elevation: 5 to 200 feet	None. No suitable abode clay or vernal pools are present within the BSA to support the species. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys and is presumed to be absent from the BSA.
heartscale	*Atriplex cordulata* var. *cordulata*	—/—/1B.2	Found in chenopod scrub, meadows and seeps, playas, and valley and foothill grasslands. Alkaline and clay soils. Blooms: April–October Elevation: 1–1,050 feet	Low. Marginal habitat is present within the grasslands, which have limited distribution in the BSA and are dominated by non-native and invasive species. The most recent CNDDB occurrence is from 1952 approximately 1.5 miles northwest of the BSA and is presumed extirpated. However, this species was not observed during the early or late season botanical surveys and is presumed to be absent from the BSA.
brittlescale	*Atriplex depressa*	—/—/1B.2	Found in chenopod scrub, meadows and seeps, playas, and valley and foothill grasslands. Alkaline and clay soils. Blooms: April–October Elevation: 1–1,050 feet	Low. Marginal habitat is present within the grasslands, which have limited distribution in the BSA and are dominated by non-native and invasive species. The most recent CNDDB occurrence is from 1996 approximately 2 miles northwest of the BSA in highly disturbed (plowed) alkali-sink habitat. However, this species was not observed during the early or late season botanical surveys and is presumed to be absent from the BSA.
vernal pool smallscale	*Atriplex persistens*	—/—/1B.2	Found in vernal pools (alkaline). Blooms: June, August–October Elevation: 30-375 feet	None. No suitable vernal pool habitat is present within the BSA. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the early or late season botanical surveys and is presumed to be absent from the BSA.

Common Name	*Scientific Name*	Status[1] (Fed/State/ CRPR)	General Habitat Description	Potential to Occur within the Biological Study Area[2]
valley brodiaea	*Brodiaea rosea* ssp. *vallicola*	—/—/4.2	Found in swales within valley and foothill grassland and vernal pools on old alluvial terraces with silty, sandy, and gravelly loam. Blooms: April–May (June) Elevation: 30-1,100 feet	None. No suitable alluvial terraces are present within the BSA to support the species. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during May 2021 botanical surveys and is presumed to be absent from the BSA.
bristly sedge	*Carex comosa*	—/—/2B.1	Found in coastal prairie, marshes and swamps (lake margins), and vernal pools. Blooms: May–September Elevation: 0 to 2,050 feet	None. Marginal habitat is present in the fresh emergent marsh wetlands. However, the wetlands within the BSA have altered hydrological regimes. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the early or late season botanical surveys and is presumed to be absent from the BSA.
pappose tarplant	*Centromadia parryi* ssp. *parryi*	—/—/1B.2	Found in coastal prairie, marshes and swamps (coastal salt), meadows and seeps, chaparral, and valley and foothill grassland (vernally mesic). Blooms: May–November Elevation: 0 to 1,375 feet	Low. Marginal habitat is present in the fresh emergent marsh wetlands within the BSA in the Yolo Bypass area. However, the wetlands within the BSA have altered hydrological regimes. There is also suitable grassland habitat within the BSA. One CNDDB occurrence from 2015 along I-80 and the east side of the Yolo Bypass. However, this species was not observed during the early or late season botanical surveys and is presumed to be absent from the BSA.
Parry's rough tarplant	*Centromadia parryi* ssp. *rudis*	—/—/4.2	Found in valley and foothill grassland and vernal pools in areas that are alkaline, vernally mesic, in seeps, and sometimes roadsides. Blooms: May–October Elevation: 0 to 330 feet	Low. Suitable habitat is present within the BSA along roadsides and habitats. No CNDDB occurrences within 5 miles of the BSA. However, this species was not observed during the early or late season botanical surveys and is presumed to be absent from the BSA.
Bolander's water-hemlock	*Cicuta maculata* var. *bolanderi*	—/—/2B.1	Found in marshes and swamps with coastal, fresh, or brackish water. Blooms: July–September Elevation: 0 to 650 feet	None. Marginal habitat is present in the fresh emergent marsh wetlands. However, the wetlands within the BSA have altered hydrological regimes. No CNDDB occurrences within 5 miles of the BSA. However, this species was not observed during the early or late season botanical surveys and is presumed to be absent from the BSA.
recurved larkspur	*Delphinium recurvatum*	—/—/1B.2	Found in chenopod scrub, valley and foothill grassland, and cismontane woodland. Alkaline soils. Blooms: March–June Elevation:10–2,600 feet	None. No alkaline grasslands are present in the BSA. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys and is presumed to be absent from the BSA.

Common Name	*Scientific Name*	Status[1] (Fed/State/ CRPR)	General Habitat Description	Potential to Occur within the Biological Study Area[2]
dwarf downingia	*Downingia pusilla*	—/—/2B.2	Found in valley and foothill grassland (mesic) and vernal pools. Blooms: March–May Elevation: 3 to 1,460 feet	Low. Marginal habitat is present within the grasslands, which have limited distribution in the BSA and are dominated by non-native and invasive species. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the early or late season botanical surveys and is presumed to be absent from the BSA.
Jepson's coyote-thistle	*Eryngium jepsonii*	—/—/1B.2	Found in valley and foothill grassland and vernal pools. Blooms: April–August Elevation: 10 to 985 feet	Low. Marginal habitat is present within the grasslands, which have limited distribution in the BSA and are dominated by non-native and invasive species; no vernal pools are present. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the early or late botanical surveys and is presumed to be absent from the BSA.
San Joaquin spearscale	*Extriplex joaquinana*	—/—/1B.2	Found in chenopod scrub, meadows and seeps, valley and foothill grassland, and playas. Alkaline soils. Blooms: April–October Elevation:2–2,740 feet	None. No grasslands with alkaline soils are present in the BSA. The most recent CNDDB occurrence is from 2001 approximately 4 miles southwest of the BSA. However, this species was not observed during the May 2021 botanical surveys and is presumed to be absent from the BSA.
stinkbells	*Fritillaria agrestis*	—/—/4.2	Found in chaparral, cismontane woodland, pinyon and juniper woodland, and valley and foothill grassland. Clay and sometimes serpentine soils. Blooms: March–June Elevation:30–5,100 feet	Low. Marginal habitat is present within the grasslands, which have limited distribution in the BSA and are dominated by non-native and invasive species. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the early or late season botanical surveys and is presumed to be absent from the BSA.
fragrant fritillary	*Fritillaria liliacea*	—/—/1B.2	Found in cismontane woodland, coastal prairie, coastal scrub, and valley and foothill grassland. Often serpentine soils. Blooms: February–April Elevation:10–1,350 feet	Low. Marginal habitat is present in the grasslands, which have limited distribution in the BSA and are dominated by non-native and invasive species. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the early or late season botanical surveys and is presumed to be absent from the BSA.
adobe-lily	*Fritillaria pluriflora*	—/—/1B.2	Found in cismontane woodland, chaparral, and valley and foothill grassland. Often adobe soils. Blooms: February–April Elevation:195–2,310 feet	Low. Marginal habitat is present within the grasslands, which have limited distribution in the BSA and are dominated by non-native and invasive species. However, this species was not observed during the early or late season botanical surveys and is presumed to be absent from the BSA.

Common Name	*Scientific Name*	Status[1] (Fed/State/ CRPR)	General Habitat Description	Potential to Occur within the Biological Study Area[2]
hogwallow starfish	*Hesperevax caulescens*	—/—/4.2	Found in valley and foothill grassland (mesic clay) and shallow vernal pools. Blooms: March–June Elevation: 0 to 1,650 feet	Low. Marginal habitat is present within the grasslands, which have limited distribution in the BSA and are dominated by non-native and invasive species. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the early or late season botanical surveys and is presumed to be absent from the BSA.
wooly rose-mallow	*Hibiscus lasiocarpos* var. *occidentalis*	—/—/1B.2	Found in marshes and swamps (freshwater). Often in riprap on sides of levees. Blooms: June–September Elevation:0–390 feet	Low. Marginal habitat is present in the fresh emergent marsh wetlands. However, the wetlands within the BSA have altered hydrological regimes. One CNDDB occurrence from 1994 was identified within the BSA in Natomas near the eastbound El Camino Avenue/I-80 on-ramp. However, this species was not observed during the early or late season botanical surveys and is presumed to be absent from the BSA.
Carquinez goldenbush	*Isocoma arguta*	—/—/1B.1	Found in valley and foothill grassland (alkaline). Blooms: August–December Elevation: 3 to 65 feet	None. No alkaline grasslands are present within the BSA. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the early or late season botanical surveys and is presumed to be absent from the BSA.
alkali-sink goldfields	*Lasthenia chrysantha*	—/—/1B.1	Found in vernal pools and wet saline flats. Blooms: February–April Elevation:0–325 feet	None. No suitable vernal pool habitat is present within the BSA. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the early or late season botanical surveys and is presumed to be absent from the BSA.
Coulter's goldfields	*Lasthenia glabrata* ssp. *coulteri*	—/—/1B.1	Found in marshes and swamps (coastal salt), playas, and vernal pools. Blooms: February–June Elevation:0–4,000 feet	None. No suitable coastal salt marsh or swamp, playas, or vernal pool habitat is present within the BSA to support the species. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys and is presumed to be absent from the BSA.
Delta tule pea	*Lathyrus jepsonii* var. *jepsonii*	—/—/1B.2	Found in marshes and swamps (freshwater and brackish). Blooms: May–July (August-September) Elevation:0–16 feet	None. Marginal habitat is present in the fresh emergent marsh wetlands. However, the wetlands within the BSA have altered hydrological regimes. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the early or late season botanical surveys and is presumed to be absent from the BSA.
legenere	*Legenere limosa*	—/—/1B.1	Found in vernal pools. Blooms: April–June Elevation: 3-2,900 feet	None. No suitable vernal pool habitat is present within the BSA. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys and is presumed to be absent from the BSA.

Common Name	*Scientific Name*	Status[1] (Fed/State/ CRPR)	General Habitat Description	Potential to Occur within the Biological Study Area[2]
Heckard's pepper-grass	*Lepidium latipes* var. *heckardii*	—/—/1B.2	Found in valley and foothill grassland (alkaline flats). Blooms: March–May Elevation: 5 to 670 feet	None. No alkaline flats are present within the BSA. The most recent CNDDB occurrence is from 1957 approximately 3 miles northeast of Davis. This species was not observed during the May 2021 botanical surveys and is presumed to be absent from the BSA.
woolly-headed lessingia	*Lessingia hololeuca*	—/—/3	Found in broad-leaved upland forest, coastal scrub, lower montane coniferous forest, and valley and foothill grassland. Clay, serpentine soil. Blooms: June–October Elevation: 50 to 1,000 feet	None. Habitat with suitable clay, serpentine soil is not present within the BSA to support the species. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the early or late season botanical surveys and is presumed to be absent from the BSA.
Mason's lilaeopsis	*Lilaeopsis masonii*	—/—/1B.1	Found in marshes and swamps (freshwater or brackish) and riparian scrub. Blooms: April–November Elevation:0–33 feet	None. Marginal habitat is present in the fresh emergent marsh wetlands and willow thickets within the BSA. However, the wetlands within the BSA have altered hydrological regimes. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the early or late season botanical surveys and is presumed to be absent from the BSA.
Delta mudwort	*Limosella australis*	—/—/2B.1	Found in marshes and swamps (freshwater or brackish) and riparian scrub. Usually mud banks Blooms: May–August Elevation:0–10 feet	None. Marginal habitat is present in the fresh emergent marsh wetlands and willow thickets within the BSA. However, the wetlands within the BSA have altered hydrological regimes No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the early or late season botanical surveys and is presumed to be absent from the BSA.
Heller's bush-mallow	*Malacothamnus helleri*	—/—/3.3	Found in chaparral on sandstone and riparian woodland on gravel. Blooms: May–July Elevation:1,000–2,080 feet	None. The BSA is not within elevational range of this species. No CNDDB occurrences within 5 miles of the BSA.
little mousetail	*Myosurus minimus* ssp. *apus*	—/—/3.1	Found in valley and foothill grassland and vernal pools (alkaline). Blooms: March–June Elevation: 65 to 2,100 feet	Low. Marginal habitat is present within the grasslands, which have limited distribution in the BSA and are dominated by non-native and invasive species. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the early or late season botanical surveys and is presumed to be absent from the BSA.

Common Name	*Scientific Name*	Status[1] (Fed/State/ CRPR)	General Habitat Description	Potential to Occur within the Biological Study Area[2]
Baker's navarretia	*Navarretia leucocephala* ssp. *bakeri*	—/—/1B.1	Found in cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland and vernal pools. Mesic. Blooms: April–July Elevation:15–5,700 feet	Low. Marginal habitat is present within the grasslands and woodlands, which have limited distribution in the BSA and are dominated by non-native and invasive species. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the early or late season botanical surveys and is presumed to be absent from the BSA.
bearded popcorn flower	*Plagiobothrys hystriculus*	—/—/1B.1	Found in valley and foothill grassland (mesic) and vernal pool margins. Blooms: April–May Elevation: 0 to 900 feet	Low. Marginal habitat is present within the grasslands, which have limited distribution in the BSA and are dominated by non-native and invasive species. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys and is presumed to be absent from the BSA.
California alkali grass	*Puccinellia simplex*	—/—/1B.2	Found in chenopod scrub, meadows and seeps, valley and foothill grassland, and vernal pools. Alkaline, vernally mesic; sinks, flats, and lake margins. Blooms: March–May Elevation: 5–3,050 feet	Low. Marginal habitat is present within the grasslands, which have limited distribution in the BSA and are dominated by non-native and invasive species. The most recent CNDDB occurrence is from 1962 at an unknow location north of Davis and is presumed extirpated. This species was not observed during the May 2021 botanical surveys and is presumed to be absent from the BSA.
Sanford's arrowhead	*Sagittaria sanfordii*	—/—/1B.2	Found in marshes and swamps (assorted shallow freshwater). Blooms: May–October (November) Elevation:0–2,130 feet	Low. Marginal habitat is present in the fresh emergent marsh wetlands within the BSA. However, the wetlands within the BSA have altered hydrological regimes. The most recent CNDDB occurrence is from 1993 approximately 3 miles northeast of the BSA along the American River bike trail. However, this species was not observed during the early or late season botanical surveys and is presumed to be absent from the BSA.
Suisun Marsh aster	*Symphyotrichum lentum*	—/—/1B.2	Found in marshes and swamps (brackish and freshwater). Blooms: (April) May–November Elevation:0–10 feet	None. Marginal habitat is present in the fresh emergent marsh wetlands within the BSA in the Yolo Bypass area. However, the wetlands within the BSA have altered hydrological regimes. A single CNDDB occurrence from 2013 was identified within the Yolo Bypass less than 1 mile south of the BSA. However, this species was not observed during the early or late season botanical surveys.

Common Name	*Scientific Name*	Status[1] (Fed/State/ CRPR)	General Habitat Description	Potential to Occur within the Biological Study Area[2]
saline clover	*Trifolium hydrophilum*	—/—/1B.2	Found in marshes and swamps, valley and foothill grassland (mesic, alkaline), and vernal pools. Blooms: April–June Elevation: 0 to 985 feet	None. Suitable habitat with alkaline soil is not present within the BSA to support the species. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys and is presumed to be absent from the BSA.

[1] CRPR Codes and Extensions:
1A Plants presumed extirpated in California and either rare or extinct elsewhere.
1B Plants rare, threatened, or endangered in California and elsewhere.
2A Plants presumed extirpated in California, but more common elsewhere.
2B Plants rare, threatened, or endangered in California, but more common elsewhere.
3 Review list: Plants about which more information is needed
4 Watch List: Plants of limited distribution
xx.3 Not very endangered in California
xx.2 Fairly endangered in California
xx.1 Seriously endangered in California

[2] Assessment Codes:
Present: The species is known to be present or has been recently observed in the BSA. **High**: The species has been observed and documented within 5 miles of the BSA within the last 5 years and habitat for the species is present in the BSA. **Moderate**: The BSA is located within the range of the species, there are documented occurrences within 5 miles of the BSA, and potential habitat for the species exists in the BSA. **Low**: The BSA is located within the range of the species, but no past documented occurrences have been recorded within 5 miles and only low quality (e.g., small fragmented patches or habitats under the influence of frequent anthropogenic disturbances) are present in the BSA. **None**: Focused surveys determined the species is absent from the BSA, the species is acknowledged to be extirpated locally or the BSA is located outside of the species range, or potential habitat to support the species is not present in the BSA.
Key: Fed – Federal, CRPR – California Rare Plant Rank, BSA – Biological Study Area, CNDDB – California Natural Diversity Database,

2.3.3.3 Environmental Consequences

No Build Alternative 1

Construction and Operation

No Build Alternative 1 would make no physical or operational improvements within the BSA. Therefore, No Build Alternative 1 would not affect special-status plant species.

Build Alternatives 2a and 2b

Construction and Operation

Protocol-level botanical surveys were performed during the blooming period of special-status plants that had potential habitat within the BSA. No special-status plants occur within the BSA; therefore, no adverse effects would occur. However, Standard Measure BIO-4 (see Appendix E) has been incorporated in the project to further reduce the potential for effects to special-status plants outside the BSA to occur as a result of the project, including the spread or introduction of non-native plants within the BSA.

Build Alternatives 3a and 3b

Construction and Operation

Build Alternatives 3a and 3b would involve adding an HOT2+ lane in each direction. Build Alternatives 3a and 3a propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively; therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 4a and 4b

Construction and Operation

Build Alternatives 4a and 4b would involve adding an HOT3+ lane in each direction. Build Alternatives 4a and 4b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively; therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 5a and 5b

Construction and Operation

Build Alternatives 4a and 4b would involve adding an HOT3+ lane in each direction. Build Alternatives 4a and 4b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively; therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 6a and 6b

Construction and Operation

Build Alternatives 6a and 6b would involve adding a transit-only lane in each direction. Build Alternatives 6a and 6b propose similar project components within the same project area as Build Alternatives 2a and 2b; therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 7a and 7b

Construction and Operation

Build Alternatives 7a and 7b would involve repurposing the current number 1 general purpose lane to HOV 2+. No new lanes would be constructed. Build Alternatives 7a and 7b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively; therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

2.3.3.4 Avoidance, Minimization, and/or Mitigation Measures

No AMMs or MMs are required to reduce effects related to special-status plant species.

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 4150 and 4152 of the California Fish and Game Code

2.3.4.2 Affected Environment

The BSA provides sufficient habitat for various common and special-status wildlife species. This section addresses the regionally occurring special-status wildlife species. The potential for these species to occur within the BSA are presented in Table 2.3-7.

Western Pond Turtle

Western pond turtle (*Emys marmorata*) is designated as a species of special concern by CDFW. The federal listing status is under review under FESA as of April 10, 2015 (80 FR 192590 19263). This species is found throughout California in a wide range of permanent and intermittent aquatic habitats such as ponds, marshes, rivers, streams, and ephemeral pools with emergent structure for basking and feeding. Western pond turtles also use adjacent upland sites for nesting, often traveling great distances over land to reach suitable nesting sites.

A CNDDB database search and visual assessment to evaluate the potential for western pond turtle to occur within the BSA were conducted. The most recent CNDDB occurrence is from 2001 approximately 0.25 mile north of the BSA documenting 76 individuals, with one hatchling and eight juveniles captured between 1996 to 2001 in a disturbed portion of the UC Davis Arboretum waterway. Aquatic habitat for western pond turtle is present in Putah Creek, the vegetated ditches, and canals identified throughout the BSA. Suitable nesting, upland, and basking habitats (e.g., open banks, exposed logs, rocks) for the species were also identified in the BSA within or immediately adjacent to these features.

Special-Status and Nesting Migratory Raptors and Birds

The federal MBTA (15 USC 703-711), 50 CFR Part 21 and 50 CFR Part 10, and the California Department of Fish and Game Code Sections 3503, 3513, and 3800 protect migratory birds, their occupied nests, and their eggs from disturbance or destruction. “Migratory bird” includes all non-game, wild birds found in the U.S. except the house sparrow (*Passer domesticus*), European starling (*Sturnus vulgaris*), and rock dove (*Columbia livia*). The BSA and adjacent landscape provides foraging and nesting habitat for many species of birds, including those protected by the MBTA and those designated as CDFW species of special concern (SSC) and fully protected (FP) species.

Special-status and migratory raptors that could potentially forage or nest within the vicinity of the BSA during project activities such as burrowing owl (BUOW) (*Athene cunicularia*), white-tailed kite (*Elanus leucurus*), and northern harrier (*Circus hudsonius*). Potential nesting habitat includes larger trees, structures such as bridges, and open fields. Protocol surveys have been conducted within the BSA and surrounding areas for Swainson’s hawk (SWHA) (*Buteo swainsoni*) and BUOW. The results of the SWHA surveys are detailed in Section 2.3.8 and BUOW is discussed in detail below.

Table 2.3-7. Special-Status Wildlife Potentially Occurring or Known to Occur in the Biological Study Area

Common Name	*Scientific Name*	Status[1] (Fed/State)	General Habitat Description	Potential to Occur within the BSA[2]
Sacramento splittail	*Pogonichthys macrolepidotus*	—/SSC	Estuaries and deltas, endemic to California's Central Valley.	None. The BSA does not contain suitable habitat for the species.
Sacramento perch	*Archoplites interruptus*	—/SSC	Warm, turbid reservoirs and ponds.	None. The BSA does not contain suitable habitat for the species.
western spadefoot	*Spea hammondii*	—/SSC	Breeds and lays eggs in shallow, temporary pools formed by heavy winter rains, often in grasslands. Requires underground refugia, such as mammal burrows, near breeding habitat.	None. The BSA does not contain suitable breeding habitat. The seasonal wetlands within the BSA are heavily vegetated and are not inundated for a sufficient amount of time during the breeding season to support the species. The BSA is within highly disturbed right-of-way and adjacent land use is mostly urban and agriculture with frequent anthropogenic disturbances. No CNDDB occurrences within 5 miles of the BSA.
western pond turtle	*Emys marmorata*	—/SSC	Slow water aquatic habitat with available basking sites. Hatchlings require shallow water with dense submergent or short emergent vegetation. Requires an upland oviposition site near the aquatic site.	Moderate. The BSA contains suitable aquatic habitat for the species in Putah Creek, vegetated ditches, and canals throughout the BSA. The most recent CNDDB occurrence is from 2001 approximately 0.25 mile north of the BSA documenting 76 individuals (only one hatchling and eight juveniles) captured between 1996 to 2001 in a disturbed portion of the UC Davis Arboretum waterway.
northern harrier	*Circus hudsonius*	—/SSC	Nests on the ground in shrubby vegetation in emergent wetlands, along rivers or lakes, in grasslands, grain fields, or on sagebrush flats.	Present. Species was observed foraging in the Yolo Bypass during the January 12, 2021, survey of the BSA. The most recent CNDDB occurrence is from 2015 approximately 3 miles northwest of the BSA documenting an active nest in a wheat field.

Common Name	*Scientific Name*	Status[1] (Fed/State)	General Habitat Description	Potential to Occur within the BSA[2]
mountain plover	*Charadrius montanus*	—/SSC	Winter resident from September through March inhabiting grasslands and plowed fields in the Central Valley. Does not nest in California.	Moderate. The BSA contains suitable wintering habitat for the species within plowed fields and grassland habitat. No CNDDB occurrences within 5 miles of the BSA.
western burrowing owl	*Athene cunicularia*	—/SSC	Grasslands, agricultural fields, and ruderal habitats with mammal burrows.	Moderate. The BSA contains ruderal areas with suitable nesting and foraging habitats. There are five CNDDB occurrences within approximately 500 feet of the BSA. Species was not observed during protocol level surveys of the project area. In 2021
white-tailed kite	*Elanus leucurus*	—/FP	Nests in tall shrubs and trees. Forages in grasslands, agricultural fields, and marshes.	Present. White-tailed kite was observed foraging at the eastern end of the BSA during the survey on January 12, 2021. Multiple observations were made within 500 feet of the BSA during the Swainson's hawk surveys in March and April 2021. The most recent CNDDB occurrence is from 1993 approximately 3 miles northwest of the BSA documenting an active nest near Davis.
grasshopper sparrow	*Ammodramus savannarum*	—/SSC	Breeds in dry, dense grasslands with a variety of grasses and tall forbs and scattered shrubs for singing perches.	Moderate. The BSA contains suitable habitat for the species within grassland habitat. No CNDDB occurrences within 5 miles of the BSA.
purple martin	*Progne subis*	—/SSC	Colonial nester in tree cavities, under bridges and culverts, and occasionally nesting boxes. Often nests in tall, old trees near a body of water.	High. The BSA contains suitable habitat within tree cavities, bridges, and culverts. One CNDDB occurrence from 2003 documents 29 pairs observed nesting in weep holes under the I-5 freeway and street overpasses within 1 mile of the BSA.
song sparrow "Modesto population"	*Melospiza melodai*	—/SSC	Extensive wetlands and riparian forests.	High. Habitat is present in the BSA within the Yolo Bypass, Sacramento River, Putah Creek, and agricultural areas. One CNDDB occurrence from 2013 approximately 3.5 miles south of the BSA within the Yolo Bypass.

Common Name	*Scientific Name*	Status[1] (Fed/State)	General Habitat Description	Potential to Occur within the BSA[2]
yellow-headed blackbird	*Xanthocephalus*	—/SSC	Nests in colonies located in dense emergent wetland of cattails, tules, etc., often along the border of the lake or pond.	Low. The BSA contains suitable habitat for the species mostly between the east end of the Yolo Bypass and Davis city limits. No CNDDB occurrences within 5 miles of the BSA.
pallid bat	*Antrozous pallidus*	—/SSC	Day roosts typically include rocky outcrops, cliffs, large-diameter live and snag trees, and crevices. Also roost in caves, mines, bridges, culverts, barns, porches, and bat boxes.	High. Suitable winter hibernation and maternity roost habitat is present in the bridges throughout the BSA. The most recent CNDDB occurrence is from 1964, 1 mile north of the BSA in Davis.
western red bat	*Lasiurus blossevillii*	—/SSC	Typically roost solitarily in dense tree foliage, particularly in willows, cottonwoods, and sycamores. Strongly associated with riparian habitats, particularly mature stands of cottonwood/sycamore.	High. Suitable roost habitat within the BSA located along the Sacramento River, Putah Creek, and South Fork Putah Creek. No recorded CNDDB occurrences within 5 miles of the BSA.
American badger	*Taxidea taxus*	—/SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Several hundred undisturbed acres are required for home range.	None. Suitable undisturbed habitat is not present within or adjacent to the BSA. The most recent CNDDB occurrence was approximately 3.5 miles northeast of the BSA documenting a dead badger collected in 1997.

[1] Status Codes: State Fully Protected (FP); CDFW Species of Special Concern (SSC).
[2] Assessment Codes:

Present: The species is known to be present or has been recently observed in the BSA. **High:** The species has been observed and documented within 5 miles of the BSA within the last 5 years and habitat for the species is present in the BSA. **Moderate:** The BSA is located within the range of the species, there are documented occurrences within 5 miles of the BSA, and potential habitat for the species exists in the BSA. **Low:** The BSA is located within the range of the species, but no past documented occurrences have been recorded within 5 miles and only low quality (e.g., small fragmented patches or habitats under the influence of frequent anthropogenic disturbances) are present in the BSA. **None:** Focused surveys determined the species is absent from the BSA, the species is acknowledged to be extirpated locally or the BSA is located outside of the species range, or potential habitat to support the species is not present in the BSA.

Key: BSA – Biological Study Area, CNDDB – California Natural Diversity Database

Bird species observed in the area during site visits include SWHA, bald eagle (*Haliaeetus leucocephalus*), red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*Buteo lineatus*), osprey (*Pandion haliaetus*), American kestrel (*Falco sparverius),* white-tailed kite (*Elanus leucurus*), northern harrier (*Circus hudsonius*), prairie falcon (*Falco mexicanus*), peregrine falcon (*Falco peregrinus*), Cooper's hawk (*Accipiter cooperii*), California scrub jay (*Aphelocoma coerulescens*), northern mockingbird (*Mimus polyglottos*), great egret (*Ardea alba*), turkey vulture (*Cathartes aura*), yellow rumped warbler (*Setophaga coronata*), Nuttall's woodpecker (*Picoides nuttallii*), black phoebe (*Sayornis nigricans*), Brewer's blackbird (*Euphagus cyanocephalus*), red-winged blackbird (*Agelaius phoeniceus*), California towhee (*Pipilo crissalis*), spotted towhee (*Pipilo maculatus*), European starling (*Sturnus vulgaris*), American crow (*Corvus brachyrhynchos*), house finch (*Carpodacus mexicanus*), barn swallow (*Hirundo rustica),* brown-headed cowbird (*Molothrus ater),* Canada goose (*Branta canadensis*), greater white-fronted goose (*Answer albifrons*), killdeer (*Charadrius vociferus*), mallard (*Anas platyrhynchos*), mourning dove (*Zenaida macroura*), northern flicker (*Colaptes auratus*), rock pigeon (*Columba livia*), western meadowlark (*Sturnella neglecta*), white-crowned sparrow (*Zonotrichia leucophrys*), American avocet (*Recurvirostra americana*), common raven (*Corvus corax*), great horned owl (*Bubo virginianus*), American robin (*Turdis migratoriu*s), yellow-billed magpie (Pica nuttalli), American white pelican (*Pelecanus erythrorhynchos*), Anna's hummingbird (*Calypte anna*), western kingbird (*Tyrannus verticalis*), double-crested cormorant (*Phalacrocorax auritus*), and marsh wren (*Cistothorus palustris*).

The following special-status bird species have been identified as having a potential to occur within or adjacent to the BSA.

Northern Harrier

Northern harrier is listed as a species of special concern by CDFW. Northern harrier nests on the ground and forages in and near wet habitats such as freshwater marsh; wet meadows; grasslands; lightly grazed pastures; some croplands; and weedy borders of lakes, rivers, and streams. The northern harrier breeding range extends from sea level in the Central Valley and Sierra Nevada to 5,700 feet. The BSA occurs within the year-round range of northern harrier and the annual grasslands habitat provides potential nesting/foraging habitat for the species. Breeding season is typically from early April to September.

Mountain Plover

Mountain plover (*Charadrius montanus)* is designated as a species of special concern by CDFW. They winter in California's Central Valley from Sutter and Yuba Counties southward and breed from northern Montana and North Dakota south through the Great Plans to southeastern New Mexico and Texas. The BSA is within the winter range (September to March) for the species. Mountain plover prefers habitats with open grassland, plowed fields with little vegetation, and open sagebrush areas. The annual grassland and cropland habitats provide potential foraging habitat for the species from September to March.

Burrowing Owl

BUOW is designated as a species of special concern by CDFW. BUOW is a year-round resident typically wintering in the same locations as their breeding territory. The species nests in dry grassland, desert, and ruderal habitats. They often nest on the banks of canals and levees. They inhabit small mammal burrows or other suitable underground cavities for nesting. Breeding typically takes place from March to August. The BSA occurs within the year-round range of BUOW. There are five CNDDB occurrences within approximately 500 feet of the BSA.

Protocol-level surveys for BUOW were performed according to methodology described in the *Habitat Assessment of the Burrowing Owl Survey Protocol and Mitigation Guidelines* (BUOW Survey Protocol) (The California Burrowing Owl Consortium 1993). Per the BUOW Survey Protocol, the BSA was established with a 150-meter buffer around the BSA to survey for suitable habitat and potential burrows in areas where impacts from factors such as noise and vibration could impact BUOWs. Surveys were performed on February 10, April 16, May 13, May 20, and June 3, 2021, and January 13, 20–21, and 25, 2022. The survey efforts identified grassland and ruderal areas within 150 meters of the BSA that provide suitable nesting and foraging habitat for BUOW. Approximately 10.3 acres of suitable habitat and 0.3 acre of concentrated burrows where BUOW have the potential to nest were identified and mapped during the surveys. Further details of the BUOW surveys can be found in Appendix I of the NES.

White-Tailed Kite

White-tailed kite (*Elanus leucurus)* is fully protected by CDFW. White-tailed kites are found throughout California in coastal and valley lowlands. White-tailed kites typically nest in dense stands of tall shrubs and trees located adjacent to foraging habitat (i.e., undisturbed open grasslands, meadows, farmlands, and emergent wetlands), and are seldom observed more than 0.5 mile from an active nest during the breeding season (Zeiner et al. 1990). The BSA occurs within the year-round range of white-tailed kite. The valley oak woodland, valley foothill riparian, coastal oak woodland, and interior oak woodland habitats all provide nesting habitat for white-tailed kite. The annual grassland and cropland habitats provide potential foraging habitat for the species. Breeding season can take place from early February to October, typically peaking from May to August.

Grasshopper Sparrow

Grasshopper sparrow (*Ammodramus savannarum*) is designated as a species of special concern by CDFW. The breeding range is in the foothills and valley west of the Cascade-Sierra Nevada crest from Mendocino and Trinity Counties south to San Diego County. The winter range is along the southern coast of California. They nest in dense grasslands with thick cover of grasses and forbs. Nests are built in a slight depression in the ground hidden at the base of overhanging vegetation for concealment. Grasshopper sparrow also requires a mix of taller vegetation for singing perches. The annual grassland habitat provides potential nesting and foraging habitat for the species. Breeding season occurs between early April to mid-July, with a peak in May and June.

Purple Martin

Purple martin (*Progne subis*) is designated as a species of special concern by CDFW. Their current breeding range within California includes the coastal mountains, Sierra Nevada, Cascades, and two locations in the Central Valley. The Yolo and Sacramento portions of the BSA is located within one of these breeding ranges. They are a migratory bird typically arriving in their breeding range from South America in late March and departing by late September. They typically nest in old woodpecker cavities and human-made structures such as nesting boxes, under bridges, and culverts. Nests are typically located in open forest or woodland; and foraging over riparian areas and woodland habitats. The bridges and culverts provided potential nesting habitat and the valley foothill riparian habitat provides potential foraging habitat for the species. Breeding season is typically from early April to August.

Song Sparrow "Modesto Population"

The song sparrow "Modesto population" (*Melospiza melodai)* is designated as a species of special concern by CDFW. They are year-round residents of the Sacramento Valley, Sacramento-San Joaquin Delta, and northern San Joaquin Valley. They nest in emergent freshwater marshes, riparian forests, along vegetated irrigation canals and levees, and in recently planted valley oak restoration sites. The fresh emergent wetland and valley foothill riparian habitats provide potential nesting and foraging habitat for the species. Breeding season is typically from early April to July.

Yellow-Headed Blackbird

Yellow-headed blackbird (*Xanthocephalus xanthocephalus*) is designated as a species of special concern by CDFW. In California, the breeding range is in the Central Valley and selected locations in the coast ranges west of the Central Valley. The winter range includes parts of California and Mexico. Yellow-headed blackbird typically forages on insects, spiders, and seeds. The fresh emergent wetland habitat provides potential foraging habitat for the species. Breeding typically occurs from mid-April through July with nests built in dense vegetation such as cattails (*Typha* sp.), tules (*Scirpus* sp.), willow thickets (*Salix* spp.), and blackberry (*Rubus* sp.).

Bat Species

Townsend's big-eared bat (*Corynorhinus townsendii*), pallid bat (*Antrozous pallidus*), and western red bat (*Lasiurus blossevillii*) are all designated as species of special concern by CDFW. Bat species may roost individually or in small groups in tree cavities, in rock crevices, in riparian vegetation, or in man-made structures (e.g., bridges). Townsend's big-eared bat typically roosts in cavities such as caves, tree basal hollows, mines, tunnels, buildings, bridges, or other human-made structures. Pallid bats typically roost in rocky outcrops, cliffs, large-diameter live and snag trees, spacious crevices with access to open habitats for foraging, caves, mines, bridges, barns, porches, tree crevice roosts, bat boxes, and on the ground in stone piles, debris piles, baseboards, and rocks. Western red bats typically roost in dense riparian tree foliage. Although not a special-status species, Mexican free-tailed bat (*Tadarida brasiliensis*) is a species of local importance to the public and communities within/near the BSA and commonly roosts in caves and rock crevices on cliff faces, abandoned mines and tunnels, highway bridges and large culverts, buildings, and bat houses.

Surveys were performed on December 18, 21, and 22, 2020, to identify suitable roosting habitat for bats within the BSA. Foliage roost habitat for western red bat and human-made structures (i.e., bridges, culverts) that contain suitable roosting habitat for Townsend's big-eared bat and pallid bat are present in the BSA. The BSA contains trees, specifically within the riparian areas along the Sacramento River, Putah Creek, and South Fork Putah Creek, that may contain suitable roosting habitat (e.g., cavities, exfoliating bark) for bats. In addition, the existing bridge over the Yolo Bypass contains one of the largest maternal colonies of Mexican free-tailed bats in the state of California and is well known to the residences and non-governmental agencies in the region. The most recent CNDDB recorded occurrence of pallid bat is from 1964 located 1 mile north of the BSA in Davis. There are no CNDDB occurrences of western red bat or Townsend's big-eared bat within 5 miles of the BSA. Mexican free-tailed bat is not reported in the CNDDB.

2.3.4.3 Environmental Consequences

No Build Alternative 1

Construction and Operation

No Build Alternative 1 would make no physical or operational improvements within the BSA. Therefore, No Build Alternative would not affect special-status animal species.

Build Alternatives 2a and 2b

Construction

Western Pond Turtle

Construction activities are not likely to directly or indirectly impact breeding and nesting activities since construction would occur outside the turtle nesting season; and certain construction activities, such as vegetation removal and soil compaction stemming from grading, would not affect areas where potential nesting habitat is present (e.g., open water and valley foothill riparian habitats along Putah Creek). Standard Measures BIO-1, BIO-2, BIO-3, and BIO-4, listed in Appendix E, would minimize potential impacts to western pond turtle. In addition, AMM BIO-4 would allow for construction to cease until western pond turtles have left the work area, and AMM BIO-5 would require species-specific training for workers.

Burrowing Owl

None of the potential BUOW habitat identified is located within the permanent construction footprint, but approximately 0.03 acre of concentrated burrows is located within the staging area adjacent to Kidwell Road at the west end of the BSA. However, if BUOWs are present within the 500-foot buffer during construction activities, the project could result in temporary displacement of individuals due to the noise and vibration of project activities near potential burrow sites. The area currently has high noise levels from existing heavy traffic conditions; therefore, adverse effects on BUOW as a result of noise and vibration from construction are anticipated to be minimal. Although no BUOWs were observed during the 2021 nesting season, they have potential to nest in areas mapped as suitable habitat and concentrated burrows, as well as other areas, depending on-site conditions. Standard Measure BIO-1 would require the species to be covered in the Worker Environmental Awareness Training. AMMs BIO-7 through 9 would require pre-construction surveys for BUOW and the implementation of avoidance buffers if active burrows are identified.

Other Special-Status and Migratory Birds and Raptors

Tree and vegetation removal would result in a temporary loss of nesting and foraging habitat for raptors, nesting birds, and migratory birds. Approximately 2.828 acres of nesting habitat would be temporarily impacted and include 0.453 acre of coastal oak woodland, 0.505 acre of valley oak woodland, and 1.87 acres of valley foothill riparian habitat could potentially be impacted. The temporary impact from the loss of nesting and foraging habitat would be minimal given the ample habitat in the vicinity of the BSA. Tree and vegetation removal may also affect foraging success, food sources for herbivorous birds, and reduction in prey density for carnivorous or insectivorous birds. Birds could also abandon nests from noise and construction activities nearby. Following completion of construction, trees would be replanted and the surrounding habitat would be restored. Standard Measure BIO-2 would require pre-construction nesting surveys and the establishment of avoidance buffers for active nests. AMM BIO-2 would require minimizing the amount of riparian vegetation removed. Standard Measure BIO-4 would require replanting, reseeding, and restoration of disturbed areas along with minimizing vegetation removal. AMM BIO-10 would require consultation with CDFW if creating a no disturbance buffer around a white-tailed kite or northern harrier nest is not practicable. AMM BIO-11 would prohibit activities that would result in take of a white-tailed kite nest.

Bat Species

Build Alternatives 2a and 2b would result in temporary displacement of bats and temporary loss of potential bat roosting habitat for locations where culvert removal and tree trimming/removal would occur. If culvert work or tree removal would take place during the reproductive season (early May to August), there is a potential for direct mortality of young bats to occur. Bats typically give birth to young in May but form maternity colonies as early as March. Permanent impacts could occur from bat mortality resulting from the removal of maternity roost habitat. No construction would occur on the existing bridge over the Yolo Bypass, so the maternity colony that roosts under the bridge would not be directly impacted. Temporary impacts on bats would result from construction related noise, lights during night work, and vibration disturbance to bats roosting adjacent to active construction. These impacts have the potential to impact the bats by disturbing their behavior, growth, reproduction, or survival. With the implementation of Standard Measures BIO-1 and BIO-2, adverse effects on special-status bat species would be reduced. In addition, AMM BIO-12 would require trees to be removed after young bats are volant to avoid impacts to maternity colonies, AMM BIO-13 would require pre-construction bat surveys, AMM BIO-14 would require a bat protection plan, and AMM BIO-15 minimizes impacts to bats from structural changes to potential roosting habitat.

Operation

Once construction is completed, Build Alternatives 2a and 2b would carry two more travel lanes than existing conditions. However, the impacts to special-status animal species would not increase from existing conditions.

Build Alternatives 3a and 3b

Construction and Operation

Build Alternatives 3a and 3b would involve adding an HOT2+ lane in each direction. Build Alternatives 3a and 3b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively; therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 4a and 4b

Construction and Operation

Build Alternatives 4a and 4b would involve adding an HOT3+ lane in each direction. Build Alternatives 4a and 4b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively; therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 5a and 5b

Construction and Operation

Build Alternatives 5a and 5b would involve adding an express lane in each direction. Build Alternatives 5a and 5b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively; therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 6a and 6b

Construction and Operation

Build Alternatives 6a and 6b would involve adding a transit-only lane in each direction. Build Alternatives 6a and 6b propose similar project components within the same project area as Build Alternatives 2a and 2b; therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 7a and 7b

Construction and Operation

Build Alternatives 7a and 7b would involve repurposing the current number 1 general purpose lane to HOV 2+. No new lanes would be constructed. Build Alternatives 7a and 7b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively; therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

2.3.4.4 Avoidance, Minimization, and/or Mitigation Measures

Caltrans would implement the following AMMs to reduce impacts to special-status animals.

- **AMM BIO-4: Western Pond Turtle.** If western pond turtles are encountered within the BSA during construction, work activity in the immediate vicinity will cease until any turtles have left the work area on their own or a CDFW-approved biologist moves the individual out of harm's way.
- **AMM BIO-5: Worker Training for Western Pond Turtle.** Prior to initiation of construction activities, workers will participate in environmental awareness training provided by a qualified biologist. The training will instruct workers regarding: (1) how to identify the turtle; (2) the habitats used by the turtle; (3) the potential for turtle egg clutches (i.e., nest sites) to be discovered during vegetation clearing; and (4) what to do if a turtle or suspected egg clutch is encountered during construction activities.
- **AMM BIO-6: Pre-Construction Tricolored Blackbird and Yellow-Headed Blackbird Surveys.** Pre-construction surveys for tricolored blackbird and yellow-headed blackbird should be conducted prior to any ground-disturbing activities within 500 feet of mapped potentially suitable habitat. Pre-construction surveys should be conducted in mid-March, mid-April, mid-May, and mid-June given that the dates of nesting in Northern California are not consistent from year to year and given that the species may nest twice in the same nesting season at the same or different locations. The recommendation of a survey every 30 days during the nesting season is based on the potential length of the nesting season in the Sacramento Valley (i.e., mid-March to mid-July) and total time required for incubation and fledging (i.e., 21 to 25 days). Note that the full complement of four survey visits can be reduced accordingly if work starts after mid-March, and surveys can be avoided entirely if work starts between August 1 and March 1 (i.e., outside the nesting season).
- **AMM BIO-7: Pre-Construction BUOW Surveys.** A minimum of one pre-construction survey for occupied BUOW burrows within 500 feet of the BSA in suitable habitat (e.g., grasslands) will be conducted by a qualified biologist within 15 days prior to the initiation of construction activities, regardless of the timing of construction. If any occupied burrows are identified, appropriate conservation measures as determined by a qualified biologist will be implemented. No disturbance will occur within 150 feet of occupied burrows during the nonbreeding season (September 1–January 31) or within 250 feet during the breeding season (February 1–August 31). These measures may also include establishing a construction-free buffer zone around the active nest site in coordination with the CDFW, biological monitoring of the active nest site, and delaying construction activities in the vicinity of the active nest site until the young have fledged.
- **AMM BIO-8: BUOW Exclusion Plan.** If BUOW are detected within the BSA during the nonbreeding season and maintaining a 150-foot no disturbance buffer is not practicable, a qualified biologist will submit an exclusion plan to CDFW. The exclusion plan will generally follow the guidelines outlined in Appendix E of the *Staff Report on Burrowing Owl Mitigation* (CDFG 2012). The exclusion plan will consist of installing one-way doors

in potential burrows, daily monitoring, and collapsing burrows once it is determined that the burrows are unoccupied. Exclusion may only take place during the nonbreeding season (September 1 to January 31) and may be an ongoing effort during this time period. This will allow the owls to exit burrows if they are present, but not return.

- **AMM BIO-9: Burrowing Owl Direct Disturbance.** If occupied burrows are detected during the breeding season and maintaining a 250-foot no disturbance buffer is not practicable, CDFW will be consulted to determine alternative measures to minimize the potential for disturbance to occupied burrows and nesting activities. Measures may include, but are not limited to, continuous biological monitoring by a qualified biologist until it has been determined that the young have fledged and are no longer reliant on the nest for parental care or survival, or the construction is complete. No direct disturbance of burrows with eggs or young can be conducted without written authorization from the CDFW.
- **AMM BIO-10: White-Tailed Kite Consultation.** If an active white-tailed kite nest is observed, CDFW will be consulted to determine alternative measures to minimize the potential for project-related disturbance to the nest site that could result in nest abandonment or other forms of take. Measures may include but are not limited to continuous biological monitoring by a qualified biologist until it has been determined that the young have fledged and are no longer reliant on the nest or parental care for survival or the construction is complete. If the nesting pair shows signs of distress as a result of project-related activities (e.g., adults leaving the nest when eggs or young chicks are present), the monitoring biologist will have authority to stop work until it is determined that the adults have returned and are no longer showing signs of distress.
- **AMM BIO-11: White-Tailed Kite Avoidance.** If consultation with CDFW results in a determination that take of a white-tailed kite nest may not be avoidable, then all activities that are likely to result in such take will be delayed until a qualified biologist has determined that the young have fledged and are no longer reliant on the nest or parental care for survival. White-tailed kites are a fully protected species, and CDFW may provide an Incidental Take Permit for this species if impacts are unavoidable.
- **AMM BIO-12: Tree Removal.** To the extent practicable, removal of large trees with cavities will occur before bat maternity colonies form (i.e., prior to March 1) or after young bats are volant (i.e., after August 31). To the greatest extent practicable, trees would be removed in pieces, rather than felling the entire tree. It is recommended that removal take place late in the day or in the evening (to reduce the likelihood of evicted bats falling prey to diurnal predators) and during warm weather conditions conducive to bat activity.
- **AMM BIO-13:** Pre-construction Bat Surveys. If construction (including the removal of large trees) occurs during the non-volant season (March 1 through August 31), a qualified biologist will conduct a pre-construction survey of the areas identified as high and moderate maternity roosting potential in the bat habitat assessment for maternity colonies. The pre-construction survey will be performed no more than 14 days prior to the implementation of construction activities, including staging and equipment access. If a lapse in construction activities for 14 days or longer occurs between those dates, another pre-construction survey will be performed. If any maternity colonies are detected, a qualified biologist will determine and implement appropriate conservation measures. These measures may include but are not limited to establishing a

construction-free buffer zone around the maternity colony site, biological monitoring of the maternity colony, and delaying construction activities in the vicinity of the maternity site.

- **AMM BIO-14: Bat Protection Plan.** A bat species protection survey plan will be developed. The plan will include items such as having a qualified biologist on-site to conduct monitoring during construction in or near bat roosting habitat.
- **AMM BIO-15: Structural Changes to Bat Roosting Habitat.** To the greatest extent practicable, structural changes may be made to any known roost proposed for removal (as determined by pre-construction surveys) to create conditions in the roost that are undesirable to roosting bats and that will encourage the bats to leave on their own (e.g., open additional portals so that the temperature, wind, light, and precipitation regimes change in the roost). Structural changes to the roost would be performed during the appropriate exclusion timing (listed above) to avoid harming bats.

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 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 BSA provides sufficient habitat for various state and federally listed plant and wildlife species. This section addresses the regionally occurring listed species. The potential for these listed plant species to occur within the BSA are presented in Table 2.3-8 and the potential for listed wildlife species to occur are presented in Table 2.3-9.

Table 2.3-8. Federal or State Listed Plants Potentially Occurring or Known to Occur in the Biological Study Area

Common Name	*Scientific Name*	Status[1] (Fed/State/ CRPR)	General Habitat Description	Potential to Occur within the BSA[2]
palmate-bracted bird's-beak	*Chlorophyron palmatum*	FT/SE/1B.1	Found in valley and foothill grassland with alkaline soil. Blooms: May–October Elevation: 85 to 90 feet	None. No suitable alkaline soils are present within the BSA to support the species. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys.
Bogg's Lake hedge-hyssop	*Gratiola heterosepala*	—/SE/1B.2	Found in marshes and swamps (lake margins) and vernal pools. Clay soil. Blooms: April–August Elevation: 33 to 7,800 feet	Low. Suitable habitat may be present in the fresh emergent marsh wetlands. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the early or late season botanical surveys and is presumed to be absent from the BSA.
Colusa grass	*Neostapfia colusana*	FT/SE/1B.1	Found in vernal pools. Blooms: May–August Elevation: 16-656 feet	None. No vernal pool habitat is present within the BSA to support the species. The most recent CNDDB occurrence is from year 2013 approximately 4 miles southwest of the BSA. This species was not observed during the May 2021 botanical surveys.
Keck's checkerbloom	*Sidalcea keckii*	FE/—/1B.1	Found in valley and foothill grassland and cismontane woodland. Serpentinite, clay soil. Blooms: April–May (June) Elevation: 245 to 2,100 feet	Low. Marginal habitat is present within the grasslands, which have limited distribution in the BSA and are dominated by non-native and invasive species. The most recent CNDDB occurrence is from year 2019 approximately 5 miles west of the BSA. This species was not observed during the May 2021 botanical surveys and is presumed to be absent from the BSA.
Crampton's tuctoria or Solano grass	*Tuctoria mucronata*	FE/SE/1B.1	Found in valley and foothill grassland (mesic) and vernal pools. Blooms: April–August Elevation: 15 to 33 feet	Low. Marginal habitat is present within the grasslands, which have limited distribution in the BSA and are dominated by non-native and invasive species. The most recent CNDDB occurrence is from year 2011 approximately 4 miles southwest of the BSA within created vernal pools. However, this species was not observed during the early or late season botanical surveys and is presumed to be absent from the BSA.

1 Status Codes: Federal Endangered (FE); Federal Threatened (FT); State Endangered (SE) / 1 CRPR Codes and Extensions: 1B Plants rare, threatened, or endangered in California and elsewhere; xx.2 Fairly endangered in California; xx.1 Seriously endangered in California

2 Assessment Codes: Present: The species is known to be present or has been recently observed in the BSA. High: The species has been observed and documented within 5 miles of the BSA within the last 5 years and habitat for the species is present in the BSA. Moderate: The BSA is located within the range of the species, there are documented occurrences within 5 miles of the BSA, and potential habitat for the species exists in the BSA. Low: The BSA is located within the range of the species, but no past documented occurrences have been recorded within 5 miles and only low quality (e.g., small fragmented patches or habitats under the influence of frequent anthropogenic disturbances) are present in the BSA. None Focused surveys determined the species is absent from the BSA, the species is acknowledged to be extirpated locally or the BSA is located outside of the species range, or potential habitat to support the species is not present in the BSA.

Key: BSA – biological study area, CNDDB – California Natural Diversity Database

Table 2.3-9. Federal or State Listed Wildlife and Critical Habitat Potentially Occurring or Known to Occur in the Biological Study Area

Common Name	*Scientific Name*	Status[1] (Fed/State)	General Habitat Description	Potential to Occur within the BSA[2]
Invertebrates				
Conservancy fairy shrimp	*Branchinecta conservatio*	FE/—	Large to very large vernal pools with turbid water in grasslands on old alluvial soils underlain by hardpan.	None. Not expected to occur. Species occurs in large vernal pools and are not currently known to occur in any waters or wetlands that intersect the BSA. No suitable habitat is present within the BSA. No CNDDB recorded occurrences within 5 miles of the BSA.
vernal pool fairy shrimp	*Branchinecta lynchi*	FT/—	Vernal and intermittent freshwater pools.	Low. Not expected to occur. Species occurs in large vernal pools and are not currently known to occur in any waters or wetlands that intersect the BSA. No suitable habitat is present within the BSA. The most recent CNDDB occurrence is from year 1995 approximately 5 miles northeast of the BSA documenting 10 adults in a seasonal pond near the Natomas East Main Drainage Canal in Sacramento.
vernal pool tadpole shrimp	*Lepidurus packardi*	FE/—	Vernal and intermittent freshwater pools.	Low. Not expected to occur. Species occurs in vernal pools and are not currently known to occur in any waters or wetlands that intersect the BSA. No suitable habitat is present within the BSA. The most recent CNDDB occurrence is from year 1979 approximately 2 miles northwest of the BSA documenting specimens found in a vernal pool adjacent to agricultural land on the north side of Davis.
valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	FT/—	Life cycle depends on elderberry shrubs (*Sambucus* spp.), which are typically associated with riparian forests that occur along rivers and streams.	High. Sixty-seven suitable elderberry shrubs were mapped within 165-feet of the BSA; 52 of which are located within the BSA. Three CNDDB occurrences within 2,526 feet of the BSA.

Common Name	Scientific Name	Status[1] (Fed/State)	General Habitat Description	Potential to Occur within the BSA[2]
Delta green ground beetle	*Elaphrus viridis*	FT/—	Found in the vicinity of vernal pools within Solano County.	None. Not expected to occur. Species occurs in large vernal pools and are not currently known to occur in any waters or wetlands that intersect the BSA. No suitable habitat is present within the BSA. The most recent CNDDB occurrence is from year 1979 approximately 2 miles northwest of the BSA documenting specimens found in a vernal pool adjacent to agricultural land on the north side of Davis.
Crotch's bumble bee	*Bombus crotchii*	—/CE	Open grasslands and scrub areas in hot and dry climates. Requires underground nesting habitat, abundant flowering plants for foraging, and overwintering habitat (soft, disturbed soil or leaf litter). Crotch's bumble bee has been nearly extirpated from the Central Valley.	None. The BSA is within highly disturbed right-of-way and adjacent land use is mostly urban and agriculture. The floristic resources and underground nesting habitat required for the species are not present within or adjacent to the BSA. In addition, the adjacent agriculture provides competition with managed bees, disease, and pesticides that are detrimental to and have been a factor in the decline of the species. The most recent CNDDB occurrence is from year 1998 approximately 0.5 mile north of the BSA along Putah Creek.
western bumble bee	*Bombus occidentalis*	—/CE	Blooming flowers along streams, meadows, roadsides, and burned or logged areas. Nests found underground in abandoned rodent burrows.	None. The BSA is not within the current range of the species. Most recent CNDDB occurrence is from year 1965 in the general vicinity of Davis.
Fish				
green sturgeon southern DPS	*Acipenser medirostris*	FT/SSC	Spawns in mainstem Sacramento and Feather rivers; juveniles are thought to rear mainly throughout the San Francisco Bay estuary.	Moderate. Suitable spawning habitat is present within the BSA in the Sacramento River. No CNDDB occurrences within 5 miles of the BSA. The BSA is in designated critical habitat.

Common Name	*Scientific Name*	Status[1] (Fed/State)	General Habitat Description	Potential to Occur within the BSA[2]
steelhead- Central Valley DPS	*Oncorhynchus mykiss irideus* pop. 11	FT/—	Spawns and rears in the Sacramento River and its tributaries. Requires cool, swift shallow water; clean, loose gravel for spawning.	High. Suitable habitat is present within the BSA in the Sacramento River and Prospect Slough. The most recent CNDDB documented occurrence is from year 2011 approximately 0.5 mile east of the BSA documenting many migrating and stranded steelhead between 1998-2011 at the eastern edge of the Yolo Bypass; including the toe drain, Sacramento Deep Water Ship Channel, and Sacramento Bypass. The BSA is in designated critical habitat.
Chinook salmon- Central Valley spring-run ESU	*Oncorhynchus tshawytscha* pop. 11	FT/ST	Sacramento and San Joaquin Rivers and tributaries with cool summer water temperatures, deep pools, and suitable spawning substrate.	High. Suitable habitat is present within the BSA in the Sacramento River. The most recent CNDDB documented occurrence is from year 2004 less than 1 mile east of the BSA documenting one adult and 26 juveniles captured in the Sacramento Deep Water Ship Channel in West Sacramento. The BSA is in designated critical habitat.
Chinook salmon- Sacramento River winter-run ESU	*Oncorhynchus tshawytscha* pop. 7	FE/SE	Adults and juveniles occur in the Sacramento River during seasonal migration periods.	High. Suitable habitat is present within the BSA in the Sacramento River. The most recent CNDDB documented occurrence is from year 2004 less than 1 mile east of the BSA documenting 36 adults and 11 juveniles captured in the Sacramento Deep Water Ship Channel in West Sacramento. The BSA is in designated critical habitat.
Delta smelt	*Hypomesus transpacificus*	FT/SE	Estuarine systems in the Sacramento-San Joaquin Delta, in reaches with slow flow.	Moderate. The BSA contains suitable habitat for the species within the Sacramento River. There are no CNDDB occurrences within 5 miles of the BSA. The BSA overlaps designated critical habitat for the species.
longfin smelt	*Spirinchus thaleichthys*	FC/ST	Open water channels and bays in salinities ranging from freshwater to seawater.	High. The BSA contains suitable habitat for the species within the Sacramento River. One CNDDB occurrence was identified in the Sacramento River within the BSA, where a single adult was collected in year 2004.

Common Name	*Scientific Name*	Status[1] (Fed/State)	General Habitat Description	Potential to Occur within the BSA[2]
Amphibians				
California tiger salamander	*Ambystoma californiense*	FT/ST	Breeding habitat consists of vernal or temporary pools in annual grasslands, or open stages of woodlands. Requires underground refugia, such as mammal burrows, within 1 mile of breeding habitat.	None. The BSA does not contain suitable breeding habitat or underground refugia (e.g., small mammal burrows) within annual grassland habitat. The seasonal wetlands within the BSA are not inundated for a sufficient duration to support breeding and development of the species in the features. Further, the BSA is within a highly disturbed right-of-way and adjacent land use is mostly urban and agriculture with frequent anthropogenic disturbances. The most recent CNDDB occurrence is from year 1993 approximately 2.5 miles northwest of the BSA documenting a live individual captured in the parking lot of an apartment complex at the north edge of Davis.
California red-legged frog	*Rana draytonii*	FE/SSC	Requires aquatic habitat for breeding, also uses a variety of other habitat types, including riparian and upland areas. Adults prefer dense, shrubby, or emergent vegetation associated with deep water pools with fringes of cattails and dense stands of overhanging vegetation. This species also breeds in ephemeral ponds that support little or no vegetation.	None. The BSA is not within the current range of the species.
Reptiles				
giant garter snake	*Thamnophis gigas*	FT/ST	Freshwater marshes and low gradient streams with emergent vegetation. Adapted to drainage canals and irrigation ditches with mud substrate.	High. Suitable aquatic and upland habitat is present within the Yolo Bypass, and other areas throughout the BSA. There are five CNDDB occurrences within 5 miles of the BSA.

Common Name	*Scientific Name*	Status[1] (Fed/State)	General Habitat Description	Potential to Occur within the BSA[2]
Birds				
Swainson's hawk	*Buteo swainsoni*	—/ST	Breeds in stands with few trees in juniper-sage flats, riparian areas, and oak savannah; forages in adjacent livestock pasture, grassland, or grain fields.	Present. Protocol-level Swainson's hawk surveys revealed 132 potential nests within 0.5 mile of the BSA; 24 of which were active SWHA nests during the 2021 nesting season. There are 75 CNDDB occurrences within 0.5 mile of the BSA. Tall trees throughout the BSA provide suitable nesting habitat. In addition to nesting, seven observations of overwintering SWHAs were made during the surveys on January 12, and February 17, 2021, in the vicinity of Davis.
bald eagle	*Haliaeetus leucocephalus*	—/SE, FP	Breeds and winters in riparian woodland with large trees, often old-growth or open canopy. Typically nests near large bodies of permanent water or perennially flowing rivers with abundant fish.	Present. One bald eagle was observed flying through the BSA during SWHA surveys. However, no suitable nesting habitat for the species was identified within 0.5 mile of the BSA during the surveys.
California black rail	*Laterallus jamaicensis coturniculus*	—/ST, FP	Resides in saline, brackish, and freshwater wetlands in the San Francisco Bay Area, Sacramento-San Joaquin Delta, coastal Southern California at Morro Bay.	None. The BSA is not within the current range of the species.
western snowy plover	*Charadrius nivosus nivosus*	FT/SSC	Nests in sandy marine and estuarine shores. Inland nesting areas include the Salton Sea, Mono Lake, and at isolated sites on the shores of alkali lakes in northeastern California, in the Central Valley, and the southeastern deserts.	None. No suitable habitat is present for the species.
western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	FT/SE	Requires dense deciduous riparian thickets or woodland with dense, low-level or understory foliage adjacent to slow-moving watercourses, backwaters, or seeps.	Moderate. The BSA is not within the current breeding range of the species. However, migratory stopover habitat is present within the riparian habitat in the BSA. A single CNDDB occurrence documents observances made September 2012 and August 2013 along Putah Creek less than 2 miles west of the BSA.

Common Name	*Scientific Name*	Status[1] (Fed/State)	General Habitat Description	Potential to Occur within the BSA[2]
least Bell's vireo	*Vireo bellii pusillus*	FE/SE	Riparian forest, scrub, or woodland; nests along margins of bushes or twigs projecting; usually willow, mulefat, or mesquite. Requires dense cover within 3-6 feet of the ground for nesting and a dense, stratified canopy for foraging.	Moderate. Although the BSA is within the current breeding range of the species, breeding habitat (i.e., the riparian vegetation lacks the structure and vegetative density required by the species for nesting) is not present within the BSA. The most recent CNDDB occurrence is from year 2011 approximately 3.5 miles south of the BSA in the Yolo Bypass documenting a nesting pair in undisturbed riparian scrub habitat. The species may use riparian habitat within the BSA for foraging or migratory stopover habitat.
bank swallow	*Riparia riparia*	—/ST	Colonial nester on vertical banks or cliffs with fine-textured soils near water.	None. The BSA does not contain suitable habitat for the species. Vertical banks and cliffs are not present within the BSA. The most recent CNDDB occurrence is from year 1986 along the American River approximately 3.5 miles east of the BSA.
tricolored blackbird	*Agelaius tricolor*	—/ST	Breeds in large colonies in freshwater marshes in dense stands of cattails or bulrushes. Forages in open habitats such as farm fields and pastures.	Moderate. Potential habitat for nesting colonies mostly between the east end of the Yolo Bypass and Davis city limits. The most recent CNDDB occurrence is from year 2014 approximately 5 miles south of the BSA in the Yolo Bypass and documents approximately 100 individuals within a nesting colony.

[1] Status Codes: Federal Endangered (**FE**); Federal Threatened (**FT**); State Endangered (**SE**); State Threatened (**ST**); Candidate Endangered (**CE**) State Fully Protected (**FP**); CDFW Species of Special Concern (**SSC**).

[2] Assessment Codes: **Present:** The species is known to be present or has been recently observed in the BSA. **High:** The species has been observed and documented within 5 miles of the BSA within the last 5 years and habitat for the species is present in the BSA. **Moderate:** The BSA is located within the range of the species, there are documented occurrences within 5 miles of the BSA, and potential habitat for the species exists in the BSA. **Low:** The BSA is located within the range of the species, but no past documented occurrences have been recorded within 5 miles and only low quality (e.g., small fragmented patches or habitats under the influence of frequent anthropogenic disturbances) are present in the BSA. **None:** Focused surveys determined the species is absent from the BSA, the species is acknowledged to be extirpated locally or the BSA is located outside of the species range, or potential habitat to support the species is not present in the BSA.

Key: Key: BSA – biological study area, CNDDB – California Natural Diversity Database, DPS – distinct population segment, ESU – evolutionarily significant unit

Valley Elderberry Longhorn Beetle

The valley elderberry longhorn beetle (VELB; *Desmocerus californicus dimorphus*) is federally listed as threatened. VELB is an insect endemic to the Central Valley of California that inhabits riparian and associated upland habitats where elderberry (*Sambucus* spp.), its host plant, grows. Specifically, its range includes the upper Sacramento Valley from the vicinity of Redding to the central San Joaquin Valley, and generally below 500 feet elevation (USFWS 1991). VELB habitat typically consists of riparian forests.

In addition to the field survey, a review of CNDDB records found that there are three occurrences of VELB within 2,526 feet of the BSA. The project falls within the Sacramento River Management Unit and the Putah Creek Management Unit (USFWS 2019). A VELB habitat assessment survey was performed on February 19 and 21–24, 2021, and July 7, 2022, to identify the location of elderberry shrubs within 165 feet of the BSA. Sixty-seven elderberry shrubs were identified within 165 feet of the BSA, of which 53 shrubs were located within the BSA. Of the 53 shrubs observed within the BSA, exit holes were observed in eight shrubs.

Central Valley Distinct Population Segment Steelhead, Central Valley Spring-Run Evolutionarily Significant Unit Chinook Salmon, Sacramento River Winter-Run Evolutionarily Significant Unit Chinook Salmon, and Green Sturgeon

Central Valley distinct population segment (DPS) steelhead (*Oncorhynchus mykiss irideus)* is listed as threatened under FESA. Central Valley steelhead generally leave the ocean from August through April and spawn from December through April in small streams and tributaries of the Sacramento River where cool, well-oxygenated water is available year-round. Timing of upstream migration is correlated with higher flow events, such as freshets or seasonal flow increases, and associated lower water temperatures. Steelhead spawn in gravel and small cobble substrates usually associated with riffle and run habitat types.

Central Valley spring-run evolutionarily significant unit (ESU) Chinook salmon (*Oncorhynchus tshawytscha* pop. 6) is listed as threatened under FESA and CESA. Adult spring-run Chinook salmon migrate upstream from the ocean during the spring, beginning in March, and hold over in deep pools of the mainstem Sacramento River and its large perennial tributaries, where fish can access cold headwaters during the summer months, and then spawn in Mill, Deer, Clear, and Butte creeks and the Feather River from mid-August through mid-October.

Sacramento River winter-run ESU Chinook salmon (*Oncorhynchus tshawytscha* pop. 7) is listed as endangered under FESA and CESA. Adult winter-run Chinook salmon begin their migration from the ocean in December and may spawn from mid-April through mid-August. Spawning primarily occurs in the upper mainstem Sacramento River near Redding. Most of each year's winter-run salmon young migrate downstream and rear in the Delta and portions of the Yolo Bypass before emigrating to the ocean.

Green sturgeon (*Acipenser medirostris)* is listed as threated under FESA and is designated as a species of special concern by CDFW. Adults begin spawning migrations from the ocean in March and typically reach their spawning destinations in the Sacramento River from roughly Colusa to above Red Bluff and in the Feather River near Oroville between March and July

(Heublein et al. 2009; Seeholtz et al. 2015). Spawning takes place between April and June in deep, turbulent pools and fast water, when temperatures range from 46 degrees Fahrenheit (°F) to 60°F (Adams et al. 2002). Following reproduction, some adults promptly migrate downstream back to the estuary and ocean, while others may over-summer and move out of the river during the first fall freshets (Heublein et al. 2009). Juveniles may rear in the river for 1 to 3 years before emigrating downstream to the estuary, primarily during the summer and fall.

Suitable migration habitat is present for all four fish species in the Sacramento River at the eastern end of the BSA and in Prospect Slough within the Yolo Bypass. The following is a summary of the general timing each species is expected to occur in the BSA and the CNDDB documented occurrences within 5 miles.

Central Valley DPS steelhead could be present in the BSA from August to April. The most recent CNDDB documented occurrence is from year 2011 approximately 0.5 mile east of the BSA documenting many migrating and stranded steelhead between 1998–2011 at the eastern edge of the Yolo Bypass, including the toe drain, Sacramento Deep Water Ship Channel, and Sacramento Bypass. The BSA is in designated critical habitat.

Central Valley spring-run ESU Chinook salmon could be present in the BSA between March and April. The most recent CNDDB documented occurrence is from year 2004 less than 1 mile east of the BSA documenting one adult and 26 juveniles captured in the Sacramento Deep Water Ship Channel in West Sacramento. The BSA is in designated critical habitat.

Sacramento River winter-run ESA Chinook could be present in the BSA in December during fall upstream migration and potentially year-round for rearing before returning to the ocean. The most recent CNDDB documented occurrence is from year 2004 less than 1 mile east of the BSA documenting 36 adults and 11 juveniles captured in the Sacramento Deep Water Ship Channel in West Sacramento. The BSA is in designated critical habitat.

Green sturgeon could be present in the BSA between March and April and again during the late summer and fall months. No CNDDB occurrences have been documented within 5 miles of the BSA. The BSA is in designated critical habitat.

Delta Smelt and Longfin Smelt

Delta smelt (*Hypomesus transpacificus*) is listed as threatened under FESA. Delta smelt are somewhat anadromous and undergo a spawning migration from brackish water to freshwater annually (Moyle 2002). In early winter, mature Delta smelt migrate from brackish, downstream rearing areas in and around Suisun Bay and the confluence of the Sacramento and San Joaquin rivers upstream to freshwater spawning areas in the Sacramento-San Joaquin Delta. They are found only from Suisun Bay upstream through the Delta in Contra Costa, Sacramento, San Joaquin, and Yolo Counties. Their historic range is thought to have extended from Suisun Bay upstream to at least Sacramento on the Sacramento River and Mossdale on the San Joaquin River.

Longfin smelt (*Spirinchus thaleichthys*) is listed as a candidate for listing under FESA and threatened under CESA. Longfin smelt reside in the Bay Delta and spawn yearly in the Delta, Suisun Marsh, and Suisun Bay. In dry years, longfin smelt can spawn in the upper Sacramento River and have been observed as far up as Colusa State Park.

Suitable habitat is present for both smelt species in the Sacramento River at the eastern end of the BSA and Prospect Slough within the Yolo Bypass. Prospect Slough may provide suitable spawning habitat for longfin melt. The BSA is within designated critical habitat for Delta smelt.

Giant Garter Snake

The giant garter snake (GGS) (*Thamnophis gigas*) is listed as threatened under FESA and CESA. This species is found in a wide range of aquatic habitats with emergent structure for basking and feeding. GGS also uses adjacent upland sites for nesting and hibernation. The species is generally considered active from May 1 to September 30. The period from October 1 to April 30 is considered the snakes' hibernation period, and they are typically found in underground refugia (e.g., burrows, riprap, debris piles) during this time.

Habitat assessment surveys were performed between December 18 and 30, 2020, and June 12, 2022, to identify the location of potential GGS habitat within 200 feet of the BSA. A total of 101.2 acres of suitable aquatic habitat and 87 acres of marginal aquatic habitat were identified within 200 feet of the BSA (Appendix E of the NES). No GGSs were observed during the surveys.

Swainson's Hawk

SWHA (*Buteo swainsoni*) is listed as threatened under CESA. SWHA nests in stands with few trees in juniper-sage flats, riparian areas, oak savannah, and open agricultural habitats. They require adjacent open fields for foraging, including livestock pastures, grasslands, alfalfa, or grain fields. According to a study performed by Estep (2009) regarding the suitability of vegetation structure on SWHA foraging habitat, different habitats offer either high, moderate, or low suitability for SWHA foraging. Their preferred prey items are voles (*Microtus* sp.), pocket gophers (*Thomomys bottae*), birds, and insects such as grasshoppers (*Caelifera* sp.) (Estep 1989). SWHAs are migratory and typically begin arriving in their breeding territory in the Central Valley in early March to April and immediately begin reconstructing previously used nests or constructing new ones (Estep 2009). They typically begin their southerly migration in early August to mid-September (Estep 2009). The BSA occurs within the current range of SWHA.

Protocol-level SWHA surveys were performed according to the SWHA Survey Protocol described in the Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley (Swainson's Hawk Technical Advisory Committee 2000). Per the SWHA Survey Protocol, the BSA was established with a 0.5-mile buffer around the BSA to survey for nesting SWHAs. Initial surveys were performed by Stantec biologists on January 12 and February 17, 2021, to identify suitable nests that could be utilized by SWHAs and other raptor species.

The surveys identified 95 potential nests that SWHAs and other raptor species (e.g., white-tailed kite) could use for nesting within 0.5-mile of the BSA. The survey efforts identified Fremont cottonwoods, valley oaks, and other tall trees within and immediately adjacent to the BSA that provide suitable nest trees for SWHAs and white-tailed kites. The annual grassland, agriculture, and ruderal habitat within the BSA provides potential foraging habitat for the species. Surveys were performed between March 22–26 and 29 and April 5–9 and 12, 2021, to document SWHA activity and identify territories. The SWHA survey identified a total of 24 active SWHA nests and 14 other raptor (i.e., 10 red-tailed hawks, one red-shouldered hawk, two great horned owls, and one osprey) nests within 0.5-mile of the BSA. Post-fledgling surveys conducted on July 7–9, 2021, identified 13 successful fledglings. Further details of the SWHA surveys can be found in Appendix H of the NES.

Bald Eagle

Bald eagles (*Haliaeetus leucocephalus)* are typically found near large bodies of water or free flowing rivers with abundant fish and adjacent snags. They build large nests in large trees in open areas. The BSA occurs within the wintering range of bald eagles. There are no CNDDB recorded occurrences within 5 miles of the BSA. However, one bald eagle was observed soaring over the Yolo Bypass on April 6, 2021, during the SWHA survey. The aquatic habitat within and adjacent to the Yolo Bypass provides potential foraging habitat for migratory bald eagles. Given the potential foraging habitat present in the BSA, no documented occurrences within 5 miles of the BSA, and no eagles or eagle-size nests observed during the 2021 field surveys, there is low potential for this species to nest within or adjacent to the BSA. The species may forage in the vicinity of the BSA or be present in the winter during migration.

Western Yellow-Billed Cuckoo

Western yellow-billed cuckoo (*Coccyzus americanus occidentalis)* is listed as threatened under FESA and endangered under CESA. It is a migratory bird wintering in South America. Within California, breeding populations are rare and scattered through the state, with the closest breeding habitat along the Sacramento River, approximately 40 miles north of the BSA near Colusa. Western yellow-billed cuckoo breeds in dense wooded riparian habitat, typically large, contiguous areas of undisturbed habitat.

The BSA is not within the current breeding range of western yellow-billed cuckoos, and large stands of dense wooded riparian habitat that could provide nesting habitat are absent from the BSA. However, western yellow-billed cuckoos could utilize the riparian habitat surrounding Putah Creek, Sacramento River, and portions of the Yolo Bypass within and adjacent to the BSA as migratory stopover habitat. A single CNDDB recorded occurrence of the species documents observances made in September 2012 and August 2013 along Putah Creek less than 2 miles west of the BSA. As such, based on the reconnaissance-level survey efforts and CNDDB record, the riparian habitats present in the BSA may provide potential foraging and migratory stopover habitat for western yellow-billed cuckoos.

Least Bell's Vireo

Least Bell's vireo (*Vireo bellii pusillus)* is listed as endangered under FESA and CESA. It is a migratory bird wintering in southern Baja California. Within California, breeding populations are mostly in the southern portion of the state with a small breeding habitat in the Yolo Bypass, approximately 3.5 miles south of the BSA. Least Bell's vireo is known to nest in riparian woodlands dominated by willow and Fremont's cottonwood. Suitable willow woodlands are typically dense with well-defined vegetative strata or layers. The most critical structural component of nesting habitat in California is a dense shrub layer 2 to 10 feet above the ground. Ideal least Bell's vireo nesting habitat consists of a riparian corridor at least 800 feet wide. Individuals may forage in adjacent scrub or chaparral habitat; and during winter, they utilize scrub vegetation adjacent to watercourses or riparian gallery forests along the west coast of northern and central Mexico. Foraging typically takes place within riparian habitat but may also extend into adjacent upland vegetation; in particular, elderberry may be important food sources for the species (USFWS 1998).

The BSA is within the current breeding range of least Bell's vireo. However, specific habitat requirements for breeding are not present within the riparian habitat identified within the BSA since the riparian areas lack the vegetative density and cover required by the species for nesting; however, the riparian habitat in the BSA may serve as foraging habitat for the species. The most recent CNDDB recorded occurrence is from year 2011, approximately 3.5 miles south of the BSA in the Yolo Bypass Wildlife Area, documenting a nesting pair in undisturbed riparian scrub habitat. Based on the reconnaissance-level survey efforts and the CNDDB occurrence, the riparian habitats present in the BSA may provide potential foraging and migratory stopover habitat for least Bell's vireo.

Tricolored Blackbird

Tricolored blackbird (*Agelaius tricolor)* is listed as a threatened species under CESA. They are colonial nesters, with tricolored blackbirds forming the largest colonies of any North American passerine bird. Thousands of birds may occur at a single site. Breeding typically occurs from mid-April through July with nests built in dense vegetation such as cattails (*Typha* sp.), tules (*Scirpus* sp.), willow thickets (*Salix* spp.), and blackberry (*Rubus* sp.). The average clutch size is 3 to 4 eggs, and two clutches may be produced per year. Tricolored blackbirds forage on insects, cultivated grains, seeds, and fruits, depending on the season (Beedy and Hamilton 1999).

The most recent CNDDB recorded occurrence of tricolored blackbird is from year 2014, approximately 5 miles south of the BSA in the Yolo Bypass and documents approximately 100 individuals within a nesting colony. Habitat assessment surveys were performed on January 5 and 7, 2021, and July 7, 2022, to identify potential tricolored blackbird nesting habitat within 500 feet of the BSA. A total of 498.7 acres of potentially suitable habitat for tricolored blackbird is within 500 feet of the BSA. Potentially suitable habitat was identified as lands that are planted in alfalfa, natural or semi-natural lands (e.g., grassland, ruderal/grassland, willow scrub, and emergent marsh) on larger parcels (generally greater than approximately 20 acres) that border other open lands. No tricolored blackbirds were observed during the surveys. Further details of the tricolored blackbird habitat assessment can be found in Appendix G of the NES.

2.3.5.3 Environmental Consequences

No Build Alternative 1

Construction and Operation

No Build Alternative 1 would make no physical or operational improvements within the BSA. Therefore, No Build Alternative 1 would not affect state or federally listed plant or animal species.

Build Alternatives 2a and 2b

Construction

Effects determinations for federally listed species and designated critical habitat are listed in Table 2.3-10. A discussion of potential project impacts on both state and federally listed species is also provided below.

Table 2.3-10. Effects on Federally Listed Species – Build Alternatives 2a and 2b

Common Name	Scientific Name	Status	Effect Finding	Effect Finding for Critical Habitat (if applicable)
Plants				
palmate-bracted bird's-beak	*Chlorophyron palmatum*	FT	No Effect	N/A
Colusa grass	*Neostapfia colusana*	FT	No Effect	N/A
Keck's checkerbloom	*Sidalcea keckii*	FE	No Effect	No Effect
Crampton's tuctoria or Solano grass	*Tuctoria mucronate*	FE	No Effect	No Effect
Invertebrates				
conservancy fairy shrimp	*Branchinecta conservatio*	FE	No Effect	N/A
vernal pool fairy shrimp	*Branchinecta lynchi*	FT	No Effect	N/A
vernal pool tadpole shrimp	*Lepidurus packardi*	FE	No Effect	N/A
valley elderberry longhorn beetle	*Desmocerus californicus dimporphus*	FT	May affect, likely to adversely affect	No Effect
Delta green ground beetle	*Elaphrus viridis*	FT	No Effect	N/A
Fish				
green sturgeon southern DPS	*Acipenser medirostris*	FT	No Effect	No Effect
steelhead- Central Valley DPS	*Oncorhynchus mykiss irideus* pop. 11	FT	No Effect	No Effect

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	FT	No Effect	No Effect
Chinook salmon-Central Valley winter-run ESU	*Oncorhynchus tshawytscha* pop. 7	FE	No Effect	No Effect
Delta smelt	*Hypomesus transpacificus*	FT	No Effect	No Effect
longfin smelt	*Spirinchus thaleichthys*	FC	No Effect	No Effect
Amphibians and Reptiles				
California tiger salamander	*Ambystoma californiense*	FT	No Effect	N/A
California red-legged frog	*Rana draytonii*	FE	No Effect	N/A
giant garter snake	*Thamnophis gigas*	FT	May affect, likely to adversely affect	N/A
Birds				
western snowy plover	*Charadrius nivosus nivosus*	FT	No Effect	N/A
western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	FT	No Effect	No Effect
least Bell's vireo	*Vireo bellii pusillus*	FE	No Effect	No Effect

Federally listed Plants

Protocol-level botanical surveys were performed during the blooming period of federally listed plants that had potential habitat within the BSA. No federally listed plants occur within the BSA; therefore, no adverse effects would occur. However, Standard Measure BIO-4 (Appendix E) has been incorporated into the project to further reduce the potential for impacts to listed plants outside the BSA to occur as a result of the project, including the spread or introduction of non-native plants within the BSA.

Wildlife

VALLEY ELDERBERRY LONGHORN BEETLE

A total of six elderberry shrubs would be directly affected, and 28 shrubs, located within 165 feet of impact areas, would be indirectly affected by the project. This corresponds with approximately 2.4 acres of temporary impacts and 3.1 acres of permanent impacts to suitable non-riparian (e.g., annual grasslands, ornamental) VELB habitat. Indirect impacts could result from dust, from removal of terrestrial vegetative cover that could increase microclimate temperatures, increase in hazardous materials, and the potential introduction of invasive plant species by construction equipment. With implementation of Standard Measures BIO-1, BIO-3, and BIO-4, adverse effects on VELB would be avoided/minimized. In addition, the implementation of AMMs BIO-16 through BIO-21 would minimize and mitigate for impacts on VELB and their habitat.

CENTRAL VALLEY DPS STEELHEAD, CENTRAL VALLEY SPRING-RUN ESU CHINOOK SALMON, SACRAMENTO RIVER WINTER-RUN ESU CHINOOK SALMON, AND GREEN STURGEON

No work is taking place within or near aquatic habitat of listed fish species. Implementation of the project would not result in direct or indirect impacts on Central Valley DPS steelhead, Central Valley spring-run ESU Chinook salmon, Sacramento River winter-run ESU Chinook salmon, or green sturgeon.

DELTA SMELT AND LONGFIN SMELT

No work is taking place within or near aquatic habitat for listed fish species. Implementation of the project would not result in direct or indirect impacts on Delta smelt or longfin smelt.

GIANT GARTER SNAKE

Approximately 4.265 acres of GGS habitat would be permanently impacted. Permanent habitat impacts would result from the bike path improvements. Approximately 3.669 acres of temporary habitat impacts would result from installation of the fiber optic line, bike path improvements, and staging areas. Direct impacts on GGS could result from an increase of hazardous materials, habitat loss, and the crushing of individuals from construction equipment. Indirect impacts could result from removal of terrestrial vegetative cover, which could increase microclimate temperatures and the potential introduction of invasive plant species, which would degrade the quality of potential habitat, by construction equipment and materials.

With implementation of Standard Measures BIO-1, BIO-2, BIO-3, and BIO-4, any adverse effect on GGS would be avoided/minimized. In addition, AMMs BIO-22 through BIO-30 would minimize impacts on GGS.

SWAINSON'S HAWK

The project could result in a temporary and permanent loss of foraging habitat and displacement of nesting SWHA due to project activities. Direct disturbance from construction activities, such as pile driving, operation of vehicles, heavy equipment operation, and earth-moving operations around active nests could result in stress, injury, or mortality to individuals. The project would have temporary impacts on foraging habitat through the staging of equipment, temporary construction access, and other construction activities. Permanent loss of foraging habitat would result from the proposed Park and Ride, proposed bike path improvements, connector structure, and other road widening. A total of approximately 10.0 acres of SWHA foraging habitat consisting of grassland and croplands (i.e., hayfield) would be permanently lost. Based on current project designs and the protocol survey results, no trees with active SWHA nests have been slated for removal.

With implementation of Standard Measures BIO-1 and BIO-2, adverse effects on SWHAs would be avoided. In addition, AMMs BIO-31 through BIO-32 would minimize impacts on SWHA.

WESTERN YELLOW-BILLED CUCKOO AND LEAST BELL'S VIREO

The suitable migratory stopover and foraging habitat (i.e., riparian vegetation) for western yellow-billed cuckoo and least Bell's vireo is located within existing Caltrans right-of-way where there are currently frequent anthropogenic disturbances from vehicles and ongoing maintenance activities (e.g., grass mowing, tree trimming, trash pickup). The riparian vegetation within these areas would not be removed, and the activities proposed in the staging areas would be similar to those already occurring in the area (e.g., high volumes of traffic and other disturbances associated with the highway). Therefore, there will be no impact on western yellow-billed cuckoo or least Bell's vireo as a result of project implementation.

Implementation of Standard Measures BIO-1 and BIO-2 would further reduce the potential for impacts on western yellow-billed cuckoo and least Bell's vireo.

TRICOLORED BLACKBIRD

Nesting habitat identified for tricolored blackbirds consists of small isolated patches within and adjacent to the BSA. The species typically nests in more extensive patches of vegetation. With limited habitat available, the likelihood of tricolored blackbirds nesting within or adjacent to the BSA is low. However, if nesting tricolored blackbirds are present within or adjacent to construction areas, they could be disturbed and abandon their nests.

Standard Measures BIO-1 and BIO-2 would avoid/minimize adverse effects on tricolored blackbird. In addition, implementation of AMMs BIO-6 would minimize impacts on tricolored blackbird.

Operation

Once construction is completed, the Build Alternative 2a and 2b would carry two more travel lanes than existing conditions. However, the impacts to federal and state listed animal species would not increase from existing conditions.

Build Alternatives 3a and 3b

Construction and Operation

Build Alternatives 3a and 3b would involve adding an HOT2+ lane in each direction. Build Alternatives 3a and 3a propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively; therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 4a and 4b

Construction and Operation

Build Alternatives 4a and 4b would involve adding an HOT3+ lane in each direction. Build Alternatives 4a and 4b propose similar project components within the same project area as

Build Alternatives 2a and 2b, respectively; therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 5a and 5b

Construction and Operation

Build Alternatives 5a and 5b would involve adding an express lane in each direction. Build Alternatives 5a and 5b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively; therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 6a and 6b

Construction and Operation

Build Alternatives 6a and 6b would involve adding a transit-only lane in each direction. Build Alternatives 6a and 6b propose similar project components within the same project area as Build Alternatives 2a and 2b; therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 7a and 7b

Construction and Operation

Build Alternatives 7a and 7b would involve repurposing the current number 1 general purpose lane to HOV 2+. No new lanes would be constructed. Build Alternatives 7a and 7b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively; therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

2.3.5.4 Avoidance, Minimization, and/or Mitigation Measures

Caltrans would implement the following AMMs to reduce impacts to threatened and endangered species.

- **AMM BIO-16: VELB Avoidance Area.** Activities that may damage or kill an elderberry shrub (e.g., trenching, paving) may need an avoidance area of at least 6 meters (20 feet) from the drip line, depending on the type of activity.

- **AMM BIO-17: Worker Education for VELB.** Prior to initiation of construction activities, workers will participate in environmental awareness training provided by a qualified biologist. The training will include VELB-specific information to all contractors, work crews, and any on-site personnel on the status of the VELB, its host plant and habitat, the need to avoid damaging the elderberry shrubs, and the possible penalties for noncompliance.

- **AMM BIO-18: VELB Timing.** As much as feasible, all activities that could occur within 50 meters (165 feet) of an elderberry shrub will be conducted outside of the flight season of the VELB (March–July).

- **AMM BIO-19: Erosion Control and Re-Vegetation.** Erosion control will be implemented, and the affected area will be revegetated with appropriate native plants.

- **AMM BIO-20: Elderberry Shrub Transplanting.** If the elderberry shrub cannot be avoided, or if indirect effects will result in the death of stems or the entire shrub, then it should be relocated following the transplanting guidelines:

    - **Monitor.** A qualified biologist will be on-site for the duration of transplanting activities to check for compliance with avoidance and minimization measures and other conservation measures.

    - **Exit Holes.** Exit-hole surveys will be completed immediately before transplanting. The number of exit holes found, GPS location of the plant to be relocated, and the GPS location of where the plant is transplanted will be reported to USFWS and CNDDB.

    - **Timing.** Elderberry shrubs will be transplanted when the shrubs are dormant (November through the first 2 weeks in February) and after they have lost their leaves. Transplanting during the non-growing season will reduce shock to the shrub and increase transplantation success.

    - **Transplanting Procedure.** Transplanting will follow the most current version of the American National Standards Institute A300 (Part 6) guidelines for transplanting (http://www.tcia.org/).

    - **Trimming Procedure.** Trimming will occur between November and February and should minimize the removal of branches or stems that exceed 1 inch in diameter.

- **AMM BIO-21: Compensation for Loss of VELB Habitat.** To mitigate for the removal of elderberry shrubs, Caltrans will purchase credits at a 1:1 ratio at a USFWS-approved conservation bank.

- **AMM BIO-22: GGS Timing.** Construction outside of paved areas will be conducted between May 1 and October 1, which is the active season for GGS, in order to minimize impacts to the species.

- **AMM BIO-23: GGS Exclusionary Fencing.** Where practicable, GGS exclusion fencing will be placed around the BSA before construction during the active period for GGS (May 1–October 1) and will be maintained through the construction period until the project has been completed.

- **AMM BIO-24: Agency Notification for GGS.** Caltrans will notify CDFW and USFWS seven days prior to when construction is scheduled to commence.

- **AMM BIO-25: Worker Education for GGS.** A Worker Environmental Awareness Training Program for construction personnel will be conducted by a USFWS and CDFW-approved biologist for all construction workers, including contractors, prior to the start of construction activities. This training will instruct workers to recognize GGS and their habitats.

- **AMM BIO-26: Pre-construction Survey for GGS.** Twenty-four hours prior to construction activities, the BSA will be surveyed for GGS by a USFWS and CDFW-approved biologist. Surveys of the BSA will be repeated if a 2-week or greater lapse in construction activity occurs. If GGS is encountered during construction, activities will cease until appropriate corrective measures have been completed or it has been determined that the GGS will not be harmed. Any sightings and any incidental take will be reported to USFWS and CDFW immediately by telephone at (916) 414-6600 or (916) 358-2900, respectively, and email or written letter addressed to the Chief, Sacramento Division (USFWS) or North Central Region (CDFW), within 1 working day of the incident.

- **AMM BIO-27: GGS Environmentally Sensitive Area.** The canals and rice fields adjacent to the BSA will be flagged and designated as an environmentally sensitive area during the construction period.

- **AMM BIO-28: GGS Post-Construction Reporting.** Upon completion of the project, all disturbed areas within the BSA will be revegetated using native plant species, and post-monitoring work and pictures will be reported to USFWS and CDFW showing that temporary impacts have been restored to pre-construction conditions.

- **AMM BIO-29: GGS Escape Ramp.** At the end of each workday, Caltrans will place an escape ramp at each end of any open trenches. This will allow any animals that may have been trapped in the trench to climb out overnight. The escape ramp may be constructed of dirt fill, wood planking, or other suitable material and placed at an angle no greater than 30 degrees.

- **AMM BIO-30: Compensation for Loss of GGS Habitat.** Caltrans will mitigate for the permanent loss of GGS habitat through the purchase of GGS mitigation bank credits. These mitigation credits will be purchased from a USFWS- and CDFW-approved GGS mitigation bank possessing a conservation easement in perpetuity with available credits located in the Sacramento County service area prior to impacts to the species. Caltrans will purchase these credits and provide a bill of sale acceptable and approved by CDFW/USFWS before construction begins. To compensate for the permanent loss of approximately 4.264 acres of GGS habitat, Caltrans will purchase 12.792 acres (a 3:1 ratio) of GGS credits.

- **AMM BIO-31: Pre-construction SWHA Survey.** If construction is to occur between February 1 and August 31, a qualified biologist will conduct pre-construction surveys for nesting SWHA, white-tailed kite, and northern harrier. The pre-construction surveys will include the project footprint and a 0.5-mile buffer for SWHA. The survey will be conducted no more than 15 days prior to the initiation of construction so that no active nests will be disturbed.

- **AMM BIO-32: SWHA Agency Consultation.** If a no disturbance buffer around an active SWHA is not practicable, CDFW will be consulted to determine alternative measures to minimize the potential for project-related disturbance to the nest site that could result in nest abandonment or other forms of take. Measures may include, but are not limited to, continuous biological monitoring by a qualified biologist until it has been determined that the young have fledged and are no longer reliant on the nest or parental care for survival or until the construction is complete. If the nesting pair show signs of distress as a result of project-related activities (e.g., adults leaving the nest when eggs or young chicks are present), the monitoring biologist will have authority to stop work until it is determined that the adults have returned and are no longer showing signs of distress.

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 botanical surveys and vegetation characterization conducted on May 10–14 and 18–20, 2021, and July 14, 2022, within the BSA. Eleven distinct vegetation communities were identified within the BSA; these are described in Section 2.3.1, Natural Communities.

Several non-native invasive plant species are present within or adjacent to the BSA, as listed in Table 2.3-11. These species dominate much of the roadway shoulder landscape within the BSA as well as much of the landscape being affected by grading or filling.

Table 2.3-11. Invasive Plant Species Present within the BSA

Cal-IPC Rating[1]	Scientific Name[2]	Common Name[2]
High	*Arundo donax*	giant reed
	Centaurea solstitialis	yellow starthistle
	Hedera helix	English ivy
	Lepidium latifolium	perennial pepperweed
	Ludwigia hexapetala	six petal water primrose
	Rubus armeniacus	Himalayan blackberry
	Tamarix parviflora	tamarisk
Moderate	*Ailanthus altissima*	tree of heaven
	Avena fatua	wildoats
	Brassica nigra	black mustard
	Bromus diandrus	ripgut brome
	Centaurea melitensis	tocalote
	Conium maculatum	poison hemlock
	Cynodon dactylon	Bermuda grass
	Dipsacus fullonum	wild teasel
	Festuca arundinacea	reed fescue
	Festuca myuros	rattail sixweeks grass
	Hirschfeldia incana	mustard
	Hordeum marinum ssp. *gussoneanum*	barley
	Hordeum murinum	foxtail barley
	Lythrum hyssopifolia	hyssop loosestrife
	Mentha pulegium	pennyroyal
	Nicotiana glauca	tree tobacco
	Oxalis pes-caprae	Bermuda buttercup
	Phalaris aquatica	harding grass
	Torilis arvensis	field hedge parsley
	Vinca major	vinca
Limited	*Bromus hordeaceus*	soft chess
	Carduus tenuiflorus	slender flowered thistle
	Dactylis glomerata	orchardgrass
	Erodium cicutarium	coastal heron's bill
	Geranium dissectum	wild geranium
	Hypochaeris glabra	smooth cat’s ear
	Medicago polymorpha	California burclover
	Phoenix canariensis	Canary Island date palm
	Plantago lanceolata	ribwort

Cal-IPC Rating[1]	Scientific Name[2]	Common Name[2]
	Polypogon monspeliensis	annual beard grass
	Raphanus sativus	jointed charlock
	Robinia pseudoacacia	black locust
	Rumex crispus	curly dock
	Salsola tragus	Russian thistle
	Schinus molle	Peruvian pepper tree
	Silybum marianum	milk thistle
	Stipa miliacea var. *miliacea*	smilo grass
	Trifolium hirtum	rose clover

Notes:
1. California Invasive Plant Inventory. Available at https://www.cal-ipc.org/plants/inventory/. Accessed February 28, 2021. (Cal-IPC. 2021)
High: Species has severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Its reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically. **Moderate**: 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**: Species are invasive but its ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. The species 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 locally persistent and problematic.
2. Taxonomic nomenclature for plant species followed Baldwin, B. G.,D. H. Goldman,R. P. D. J. Keil,T. J. Rosatti, and D. H. Wilken, editors. 2012. *The Jepson Manual: Vascular Plants of California.* Second Edition. University of California Press. Berkeley, California. (Baldwin 2012)

2.3.6.3 Environmental Consequences

No Build Alternative 1

Construction and Operation

No Build Alternative 1 would make no physical or operational improvements within the BSA. Therefore, No Build Alternative 1 would not affect invasive species.

Build Alternatives 2a and 2b

Construction

Build Alternatives 2a and 2b have the potential to contribute to the spread or introduction of invasive species within the BSA from seeds being present on construction equipment and vehicles. The BSA is currently colonized by a relatively large amount of invasive plant species that may be removed or spread around during construction. Overall, the project has the potential to result in the colonization of additional species. Implementation of Standard Measure BIO-3 (see Appendix E) would further avoid the potential for the spread of invasive species in the BSA.

Operation

Once construction is completed, Build Alternatives 2a and 2b would carry two more travel lanes than existing conditions. However, the effects on invasive species would not increase from existing conditions.

Build Alternatives 3a and 3b

Construction and Operation

Build Alternatives 3a and 3b would involve adding an HOT2+ lane in each direction. Build Alternatives 3a and 3a propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively; therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 4a and 4b

Construction and Operation

Build Alternatives 4a and 4b would involve adding an HOT3+ lane in each direction. Build Alternatives 4a and 4b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively; therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 5a and 5b

Construction and Operation

Build Alternatives 5a and 5b would involve adding an express lane in each direction. Build Alternatives 5a and 5b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively; therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 6a and 6b

Construction and Operation

Build Alternatives 6a and 6b would involve adding a transit-only lane in each direction. Build Alternatives 6a and 6b propose similar project components within the same project area as Build Alternatives 2a and 2b; therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

Build Alternatives 7a and 7b

Construction and Operation

Build Alternatives 7a and 7b would involve repurposing the current number 1 general purpose lane to HOV 2+. No new lanes would be constructed. Build Alternatives 7a and 7b propose similar project components within the same project area as Build Alternatives 2a and 2b, respectively; therefore, the effects would be the same as effects described under Build Alternatives 2a and 2b.

2.2.1.2 Avoidance, Minimization, and/or Mitigation Measures

No AMMs or MMs are required to reduce effects related to invasive plant species.

2.4 Cumulative Impacts

The analysis in this section is supported by the Project-specific Cumulative Impact Assessment prepared for the Project (GPA Consulting 2023)

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 impact assessment looks at the collective impacts posed by individual land use plans and projects. Cumulative impacts can result from individually minor but collectively substantial impacts taking place over a period of 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 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 Code of Federal Regulations (CFR) Section 1508.7.

The CEQA definition of cumulative impact refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. The individual effects may be changes resulting from a single project or multiple projects. The cumulative impact from several projects is the change in the environment, which results from the incremental impact of the Project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

Cumulative impacts were previously defined under the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of the NEPA at Title 40 Code of CFR Section 1508.7. The CEQ is responsible for developing Federal procedures to comply with

NEPA. In July 2020, CEQ comprehensively updated the NEPA regulations, repealing the definition of cumulative impacts. Subsequently, Executive Order 13990, Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis (January 2021) directed all agencies to “immediately review and, as appropriate and consistent with applicable law, take action to address the promulgation of Federal regulations and other actions during the last four years that conflict with these important national objectives” to tackle climate change.

2.4.2 Methodology

The cumulative impact study for the Project was developed by following the eight-step process set forth in the California Department of Transportation’s (Caltrans) *Guidance for Preparers of Cumulative Impact Analysis* (Caltrans 2005):

1. Identify resources to consider in the cumulative impact analysis
2. Define the resource study area
3. Describe the current condition and historical context of each resource
4. Identify Project impacts that might contribute to cumulative impacts
5. Identify other reasonably foreseeable future actions that affect each resource
6. Assess potential cumulative impacts
7. Report the results
8. Assess the need for avoidance, minimization, and/or mitigation measures

The cumulative impacts study area (study area) was selected to identify other current or reasonably foreseeable future actions. The study area is generally bounded by the I-80 corridor between PM 40.7 and 44.7 in Solano County, between PMs 0.00 and 11.72 in Yolo County, and between PMs 0.00 and 1.36 in Sacramento County; and US-50 between PMs 0.00 and 3.12 in Yolo County and between PMs 0.00 and 0.617 in Sacramento County. The boundaries of the study area were delineated by reviewing the area within a 2- to 4-mile radius of the Project area, and then adjusting the boundaries based on major roadways and land use/neighborhood boundaries. The current and reasonably foreseeable future actions are listed in Table 2.4-1and shown in Figure 2.4-1 may not be an exhaustive list of every planned project within the study area’s cities and communities. The list contains projects that have the possibility of contributing to a cumulative effect because 1) the projects would result in similar permanent impacts within the Project Resource Study Area (RSA) or 2) the projects would be constructed within the same time period as the Project (anticipated to begin in spring 2025 and end in 2028) and may result in temporary impacts at the same time as Project construction. Current and reasonably foreseeable actions include relevant transportation projects that overlap the study area. Minor development projects were not included in this analysis because they are part of overall urban development already planned for the study area and consistent with existing land use plans and policies. Therefore, their contribution to cumulative impacts is not expected to be adverse.

Table 2.4-1. List of Relevant Foreseeable Projects

Project ID	Project Name	Jurisdiction	Location	Project Description	Status
Transportation Projects					
T-1	Yolo Pavement Rehabilitation Project 03-4F650	Caltrans District 3	Yolo 80 PM 4.3/R11.4 and Yolo 50 PM 0.0/2.5	This project proposes constructing the median on the I-80 West Capitol Avenue Under Crossing (UC) and the I-80 Reed Avenue UC bridges to accommodate stage construction. Additionally, the 03-4F650 project proposes improvements for critical bridge locations within the corridor to upgrade deck surfaces, approach slabs, and slope paving. The proposed median improvement occurs throughout most of the project to accommodate for stage construction. The median concrete barrier would remain in place at other locations, and the median restriped as part of the 3H900 project to provide managed lanes, with one managed lane in each direction. The project proposes new fiber-optic lines throughout, along with some ramp metering and upgrades to other existing roadway features. These fiber-optic lines would improve the ITS monitoring capability within the corridor.	Planned construction March 2023 to December 2027.
T-2	Sac River Bridge Over Head Bryte Bend Bridge Rehabilitation 03-0F250	Caltrans District 3	Yol 80 PM R11.1/R11.7 and Sac 80 PM M0.0/M0.5: In Yolo and Sacramento Counties and near West Sacramento from 0.1 mile west of Reed Avenue UC to 0.1 mile east of Bryte Bend Bridge.	This project proposes to rehabilitate the Sacramento River Bridge and Overhead (BOH), Br.# 22-0026 L/R, on I-80 at the Yolo/Sacramento County Line in West Sacramento about three miles west of I-5. The project would rehabilitate the Sacramento River Bridge, OH, including replacing the bridge rail, replacing the deck drain system, building barrier pedestals for future electroliers, and installing conduits.	Construction completed in January 2023.

Project ID	Project Name	Jurisdiction	Location	Project Description	Status
T-3	US 50 ICM Infrastructure 03-3H330	Caltrans District 3	US-50 in El Dorado County from the El Dorado County/ Sacramento County line to Stateline Avenue in South Lake Tahoe	This project is on US-50 in and near the cities of Sacramento, Rancho Cordova, and Folsom, from the Yolo/Sacramento County line to Folsom Boulevard; and in Yolo County in West Sacramento along US-50, from the I-80/US-50 interchange to the Yolo/Sacramento County line (PM 0.0 to 3.156), and on I-80 from Enterprise Boulevard to US-50 (PM 9.2 to R9.552). Installation of TMS field elements.	Planned construction September 2021 to December 2023.
T-4	Sac 50 Design-Build 03-0H08U	Caltrans District 3	Sacramento, Sacramento River bridge, Airport Boulevard, SR-99, I-80, US-50	In Sacramento County on US 50 from PM L0.20 to PM R6.10, from the I-5 Junction to Watt Avenue. The project proposes to construct managed lanes and rehabilitate the pavement.	Construction anticipated to be complete in December 2024.
T-5	Richards Boulevard / Olive Drive Circulation Improvements 03-0H360	City of Davis	Sol 80 PM 44.5/44.7 and Yolo 80 PM 0.0/0.5	Davis, in cooperation with Caltrans, has completed a Project Study Report-Project Development Support and would be circulating Draft Project Report / Environmental Document in Early 2022 that evaluates the safety and operational functions of the interchange at Richards Boulevard and I-80. The Davis project proposes to reconfigure the westbound I-80 off-ramp and westbound I-80 on-ramp to a tight diamond; construct additional turn lanes to the eastbound I-80 on-ramp; eliminate the westbound I-80 slip off-ramp to Olive Drive; construct a two-way shared use path on the west side of Richards Boulevard that would pass under the westbound I-80 on-ramp from Richards Boulevard and cross over I-80.	Planned construction December 2023 to June 2025.
T-6	US 50 Metal Beam Guardrail Upgrade 03-1H870	Yolo County	US 50 from PM 0.0 to 3.0 and on I-80 from PM 9.0 to R10.7	The project would replace the guardrail and place vegetation control.	Construction completed December 2021.
T-7	Sac/Placer 80 Fiber Optics 03-0H540	Sacramento County	Sac PM M0.3/18.0 & Pla 80 PM 0.0/0.7	Install fiber-optic conduit, cable and pull boxes, replace sign panels, transition railing, modify ramp metering systems. limits proposed fiber-optic conduits and pull boxes along the I-80 median and eastbound I-80 outside shoulder, along westbound I-80 diagonal and loop on-ramps from West El Camino Ave, along eastbound I-80 off-ramp to West El Camino Real Ave and eastbound I-80 loop on-ramp from West El Camino Real.	Construction completed August 2022.

Project ID	Project Name	Jurisdiction	Location	Project Description	Status
T-8	Yol 80 Olive Drive Bike/Ped connection 03-4H260	City of Davis	PM 0.841/0.851	Bike/Ped structure from Olive Hill Lane to Pole Line RD OC bridge. Closure of eastbound I-80 off-ramp to Olive Hill Road.	Planned construction January 2021 to June 2023.
T-9	Yol 80 Davis 80 Rehabilitation project 03-2J260	City of Davis	PM 0.0/4.40	Remove portion of pavement and replace with RHMA-G and RHMA-O for I-80 mainline and Mace Blvd ramps. Upgrade Mace Blvd drainage facilities, metal beam guard rail, cross walks, ADA ramps and pedestrian push buttons. Install HOV ramp metering systems at Mace Blvd eastbound on-ramps to I-80. Project Initiation Document was signed December 2022.	Planned construction May 2027 to May 2028.
T-10	Sac 5/50 Interchange Painting 03-1H100	City of Sacramento	Sacramento River Viaduct (Pioneer Bridge) to 4th Street; also, on I-5 from 0.2 mile south of Broadway to S Street (PM 22.15 to PM 22.91)	Proposed painting at interchange on Sacramento River Viaduct and on I-5.	Construction completed February 2023.
T-11	Sycamore Trail Pedestrian Overcrossing 03-3H840	City of West Sacramento	City of West Sacramento	City of West Sacramento plans to construct a trail and pedestrian crossing over US-50 that would extend south from the newly developed pedestrian and bicycle trail at Joseph “Joey” Lopes Park to Westmore Oaks Elementary School. The project site is located between Evergreen Avenue and Stone Boulevard along the Sacramento Regional County Sanitation District lower northwest interceptor sewer easement. The width of the overcrossing would be either 16 or 22 feet.	Planned construction March 2023 to April 2024.

Project ID	Project Name	Jurisdiction	Location	Project Description	Status
T-12	Yolo Rail Relocation	City of Davis, along with City of West Sacramento, City of Woodland and Yolo County	City of Davis, City of West Sacramento, City of Woodland, and Yolo County	The Yolo Rail Realignment Project proposes to relocate the existing rail access from the Union Pacific Railroad mainline current alignment along the eastern edge of West Sacramento to a new location west of the I-80/US-50 split. The project would allow for the West Sacramento riverfront to fully realize its redevelopment potential, alleviate significant traffic impact from the existing freight rail alignment, and provide for the opportunity to expand freight rail service to West Sacramento's industrial areas with minimum community impact. It has been proposed to combine a new railroad overhead under I-80 as part of the combined projects 03-4F650 and 03-3H900 between the Yolo Causeway and Enterprise Boulevard to tie into existing tracks leading to/from the Port of West Sacramento.	Planning phase
T-13	County Road 32A Crossing	Yolo County	CR-32A is located north of I-80 and east of the Mace Boulevard interchange	CR-32A to improve bike path connectivity between CR-105 (just east of Davis) and the western terminus of the proposed new Class I bicycle/pedestrian facility of the Managed Lanes Project (03-3H900) that would connect with CR-32A, just west of the westbound CR-32A Off-Ramp. The County recently completed a Project Study Report and is seeking funding for this project.	Planning Phase
T-14	Bridge Preventive Maintenance on Route 505 at Horse Creek Bridge and on Route 80 at McCune Creek Bridge	Caltrans District 4 SHOPP Projects	Vacaville (Solano I-505 and I-80)	In and near Vallejo, Dixon, and Vacaville, at I-80/SR-29 Separation Bridge (No. 23-008), McCune Creek Bridge (No. 23-0084L/R) and Horse Creek Bridge (No. 23-0077L). Bridge preventive maintenance.	Environmental analysis completed in December 2020.
T-15	SOL SR 37, 80 & 780 RRFB 0P760; SOL-Var. 2020 SHOPP	Caltrans District 4 SHOPP Projects	Solano County, Various post markers	Install rectangular rapid flashing beacons in Solano County on various routes (Routes 37, 80, and 780) at various locations.	Construction anticipated to begin in 2022/2023
T-16	SOL-VAR; 2020 SHOPP	Caltrans District 4 SHOPP Projects	Solano County, Various post markers	Install best management practices (stormwater mitigation) at Routes 37, 80, 780, 101, and 121.	Construction anticipated to begin 2023/2024

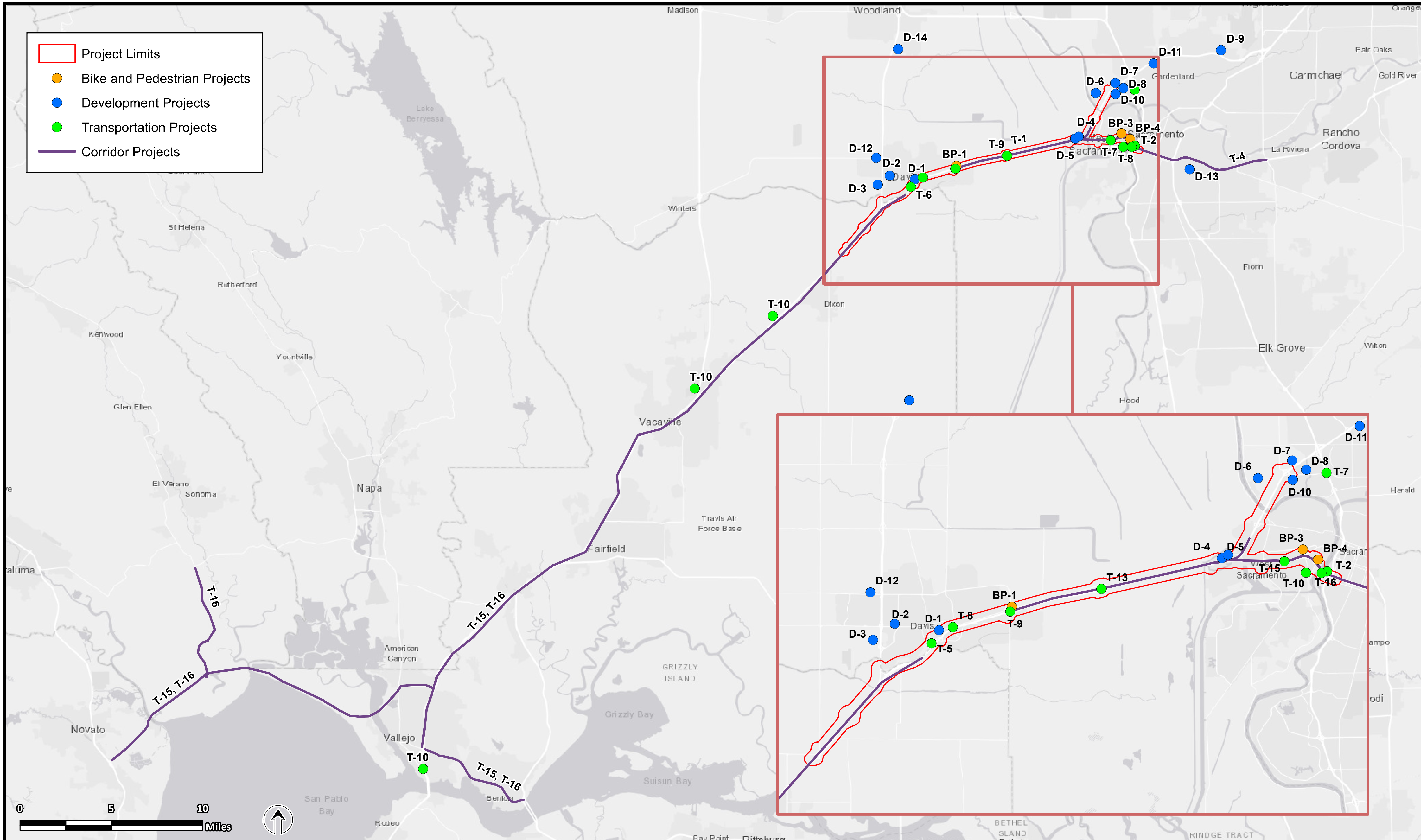
Project ID	Project Name	Jurisdiction	Location	Project Description	Status
T-17	I-5 Corridor Improvement Project 03-4H580	Caltrans D3	SAC 5 22.4-34.4	Caltrans proposes to make improvements on I-5 between post miles 22.4 and 34.4 in Sacramento County. The Proposed Action would address mobility on I-5 from the I-5/State Route (SR) 50 Interchange (south of Downtown Sacramento) to the Yolo County line, including Airport Boulevard, providing a vital link to SMF. This mobility improvement would be accomplished with northbound (NB) and southbound (SB) managed lane strategies. The Project would help relieve current traffic congestion, which would result in improved traffic flow, mobility, travel time, and reliability. In addition, the Project would improve transit access and reduce vehicle emissions and travel costs. Ramps, shoulders and gores would be reconstructed at various locations in the Project area. Some widening of or replacement of existing structures in the Project area would be required. Drainage modifications would be required due to median reconstruction where sheet flow currently drains. Addition of (or modification of existing) intelligent transportation system (ITS) elements and infrastructure including ramp meters, fiber-optic conduit and cables, and overhead signs would be part of the scope of work. Utility relocation is expected.	Project Approval and Environmental Document Phase, anticipated to be complete late 2023
T-18	SAC 51 Managed Lanes Project 03-0H931	Caltrans D3	SAC 51, PM 07-4.8	On SR 51, from N Street to 0.5 mile north of El Camino Ave (PM 0.7/4.8): Extend managed lanes, widen the American River Bridge to 10 lanes (4 lanes NB and SB plus managed lane in both directions) and add new Class I bike path on the American River Bridge, new auxiliary lane from Exposition Blvd to E St in both directions, SB auxiliary lane from Arden Way on-ramp to Exposition Blvd off-ramp, replace B St UP, A St OC, and Elvas UP, construct new Capital Corridor 3rd Track UP, widen EB SR 160/SR 51 separation structure, and widen Tribute Rd UC.	Construction planned for Nov 26 through Dec 30
Bicycle and Pedestrian Facility Projects					
BP-1	Mace Boulevard Corridor Project	City of Davis	City of Davis	Addition of green bicycle lane conflict markings where each westbound freeway ramp intersects with Mace Boulevard. Provision of bicycle intersection crossing markings at the signalized intersection of the I-80 westbound ramps and Mace Boulevard and addition of green bike lane conflict markings where each eastbound freeway ramp intersects with Mace Boulevard.	Planning phase; community meeting to be held on January 20, 2022.
BP-3	Jefferson Boulevard interchange area	City of West Sacramento	City of West Sacramento	Addition of Class II bicycle lanes. The pavement on Jefferson under the US 50 interchange structure was not widened for bicycle lanes. The pavement was recently rehabilitated as part of the West Capitol Avenue Safety Enhancement and Road Rehabilitation project.	Project construction complete.

Project ID	Project Name	Jurisdiction	Location	Project Description	Status
BP-4	S. River Road interchange area	City of West Sacramento	City of West Sacramento	The widening of 5th Street for Class II bicycle lanes through the US 50 interchange area would be constructed as part of the Riverfront Street Extension / Fifth Street Widening project.	Construction to begin soon.
I-80 Corridor Major Developments/General Plans/Specific Plans					
D-1	Olive Drive	City of Davis	City of Davis	The project would develop existing single-family homes to high density multifamily apartments.	Environmental documents approved in November 2019
D-2	University Mall/ University Commons Redevelopment Project	City of Davis	City of Davis	Transit-oriented infill project, commercial and residential.	Final City Council Approval granted on August 25th, 2020
D-3	UC Davis West Village Expansion	UC Davis	City of Davis	200-acre mixed use neighborhood integrating student, faculty, and staff housing and educational and research facilities, all centered on a civic village square.	Under construction, anticipated completion in fall of 2021
D-4	West Sacramento Corporation Yard Relocation Project	City of West Sacramento	City of West Sacramento	West Sacramento proposes to construct a new Municipal Corporation Yard Facility at 4300 West Capitol Avenue, a parcel which the city anticipates purchasing from the Port of West Sacramento.	Phase I of the project is complete.
D-5	West Capitol Avenue Road Rehabilitation and Safety Enhancement Project	City of West Sacramento	City of West Sacramento	West Capitol Avenue is envisioned as the West Sacramento's downtown: a central core with a vibrant main street that takes advantage of its prime location; providing an attractive setting for a variety of land uses including the Civic Center, Community Center, Transit Hub; and providing residential, commercial and urban parks that are accessible via multiple modes of transportation. The primary goals are to repair deteriorating pavement; complete scalloped street sections; install drainage improvements, sidewalks, access ramps, signal modifications, separated/buffered bike lanes, street lighting, high-visibility crosswalks for safer pedestrian crossings; and reduce unnecessary vehicular travel lanes.	Construction is complete.

Project ID	Project Name	Jurisdiction	Location	Project Description	Status
D-6	Upper Westside Specific Plan	Sacramento County	Sacramento County	The project would be a transportation-oriented development due to its location and proximity to transportation infrastructure and major employment regions in the region. It would also incorporate many “complete streets” aspects such as pedestrian- and bicycle-friendly infrastructure, transit services, and some compact housing to encourage alternative modes of transportation within the area. The project area is currently zoned for agricultural use, but a general plan amendment is underway to alter the land use designations for the Upper Westside Plan area.	Application accepted on February 26th, 2019. Environmental analysis in progress.
D-7	The Core Natomas 300-unit Apartments	City of Sacramento	City of Sacramento	This project provides a 300-unit apartment complex with 506 parking spaces (including 203 garage types), two accesses (orchard and via planned cul-de-sac).	Construction completed in 2020.
D-8	River Oaks Phase 2: 591 Single Family	City of Sacramento	City of Sacramento	This project provides 591 single-family lots on 83.3 acres of vacant land within the River Oaks planned unit development.	Planning phase; environmental documents submitted in 2018.
D-9	Bell Avenue Warehouses Project	City of Sacramento	City of Sacramento	The project would include development of the project site with two warehouse structures totaling approximately 339,549 sf as well as various other site improvements related to internal vehicle circulation, stormwater management, and landscaping. The warehouse situated on the eastern parcel would be approximately 259,749 sf and contain two depressed loading docks on the western face of the building. The warehouse on the western parcel would be approximately 79,800 sf and contain two depressed loading docks on the western face of the building. On-site parking would be provided by 277 proposed parking spaces.	Planning phase; environmental documents submitted in February 2020.
D-10	Rivers Oaks Marketplace	City of Sacramento	City of Sacramento	There is a plan amendment for four new commercial structures on a 3.91-acre parcel in the C-2-PUD (General Commercial-Park El Camino) Zone. This requires a Commission-level review for site plan and design review, conditional use permits, a tentative map, and a planned unit development Schematic Plan Amendment.	Project construction would be anticipated to last approximately 16 months, beginning in April of 2021 and concluding in July of 2022. Construction would proceed in a single phase.
D-11	ParkeBridge Phase 4	City of Sacramento	City of Sacramento	The project proposes to construct 108 new detached, single-unit dwellings with four house plans on approximately 22 acres in the ParkeBridge Panned Unit Development.	Subdivision is currently under development

Project ID	Project Name	Jurisdiction	Location	Project Description	Status
D-12	Bretton Woods	City of Davis	City of Davis	Davis is annexing land from Yolo County and rezoning land from agricultural intensive to medium density residential, high density residential, residential greenspace overlay, urban agriculture transition area, and mixed use. This would pave the way for 325 single-family homes, 260 of which are for senior citizens, and an additional 150 are affordable senior apartments. The project also includes an approximately 3-acre activity and wellness center. The project is on a site north of Covell Boulevard and west of SR-113, at the intersection of Shasta Drive and West Covell Boulevard.	Currently undergoing planning review of the subdivision phases.
D-13	UC Davis Long Range Development Plan	University of California, Davis	Sacramento, located off US-50 near the Highway 99/Business 80 interchange	The 2020 LRDP Update proposes general types of campus development and land uses to support projected campus population growth and enable expanded and new program initiatives. The proposed Aggie Square Phase I project consists of approximately 1,384,500-gross square feet of building space for education, research, residential and commercial uses and parking structure space.	Planning phase; environmental documents submitted in November 2020.
D-14	Woodland Research & Technology Park Specific Plan	City of Woodland	City of Woodland	Woodland is pursuing a specific plan detailing a commercial mixed use town center with 2.15 million square feet of non-residential building space for approximately 6,100 employees and 1,600 housing units. The project is located in the southern portion of Woodland's planning area, adjacent to the existing city limits, in an area bound by Farmers Central Road to the north, CR-101 to the east, SR-113 to the west, and CR-25A to the south.	Environmental analysis in progress.

Notes:
CCTV = closed-circuit television; CMS = changeable message signs; CR = County Road; I-80 = Interstate 80; LRDP = long-range development plan; sf = square feet
SHOPP = State Highway Operation and Protection Program; SR = State Route; TCE = temporary construction easement; TMS = transportation management system
U.C. = University of California; US-50 = U.S. Route 50



Sources: ESRI 2023.

Figure 2.4-1 Map of Reasonably Foreseeable Future Actions
Yolo 80 Corridor Improvement Project

2.4.3 Resources Excluded from Cumulative Impacts Analysis

The following resources have been excluded from the cumulative impacts analysis:

- **Existing and Future Land Uses:** Project improvements would mostly occur within the existing Caltrans right-of-way and would not result in any direct changes to land use adjacent to the Project area. Under all Build Alternatives, there would be some TCEs and staging outside of the Caltrans right-of-way including one small area of permanent right-of-way acquisition under Build Alternatives 2a through 7b. The area of proposed permanent right-of-way acquisition is currently undeveloped, vacant land; and would not result in the displacement of any residences or businesses. Therefore, the Project is not expected to result in cumulatively considerable impacts on land use.

- **Consistency with State, Regional, and Local Plans:** Project-related construction activities would be temporary and would not result in long-term effects that would conflict with state, regional, and local plans. Therefore, the Project would not contribute to temporary cumulative impacts related to consistency with state, regional, and local plans.

- **Farmlands:** Build Alternatives 2a through 7b would include one permanent acquisition right-of-way for construction of a Park-and-Ride Facility; however, the property is currently vacant, undeveloped land that is not categorized as an agricultural or farmland area. The alternatives with additional lanes in each direction would only expand into existing Caltrans right-of-way. Therefore, the Project would not result in cumulatively considerable impacts from the conversion of any important farmland or Williamson Act land to non-agricultural uses.

- **Population and Housing:** Build Alternatives 2a through 6b would accommodate planned regional growth but would not remove any impediments to growth, provide new public facilities, or provide new access to previously unserved areas. Build Alternatives 7a and 7b would repurpose existing lanes as managed lanes and would not add capacity. However, Alternative 7b would include the construction of the I-80 connector ramp, which would add operational capacity. Under all Build Alternatives, no residential property acquisition or relocation would be required. Project-related construction would occur primarily within the existing Caltrans right-of-way and would require acquisition of a vacant parcel to construct a Park-and-Ride Facility. The Project would not affect land uses, residential or commercial property, or any minority residences or businesses. There would be no disruption or effect on the existing community features in the surrounding areas. Therefore, the Project is not expected to result in cumulatively considerable impacts on regional population and housing.

- **Economic Conditions**: All Build Alternatives are anticipated to have a positive impact on the regional economy by improving access, travel time, and highway capacity. There would be no adverse effects on the regional economy, such as acquiring or relocating businesses, changing property or sales tax revenue for the cities or counties involved, or altering property values. Therefore, the Project is not expected to result in cumulatively considerable impacts on economic conditions.

- **Timberlands:** The Project area does not contain timberlands. Therefore, this resource has been excluded from the cumulative impacts analysis.

- **Coastal Zone:** The Project area is not located in a coastal zone. Therefore, this resource has been excluded from the cumulative impacts analysis (California Coastal Commission 2019).

- **Wild and Scenic Rivers:** The Project area does not cross any rivers designated as part of the National Wild and Scenic Rivers System. The nearest Wild and Scenic River is the Lower American River which is located approximately two miles south of the Project (U.S. Fish and Wildlife Service 2021). Therefore, no wild or scenic rivers would be affected by construction or operation of the Project.

- **Plant Species:** The RSA was determined to have potential habitat for 25 special-status plant species. However, focused botanical surveys conducted in May and August 2021 and July 2022 found no special-status plant species within the RSA. Construction activities associated with the Project would not result in permanent or temporary disturbances of potential habitat for special-status plant species. Therefore, the Project is not expected to result in cumulatively considerable impacts on special-status plants.

- **Invasive Species:** According to the ratings in the California Invasive Plant Inventory produced by California Invasive Plant Council (Cal-IPC), there are currently 45 invasive plant species within the Biological Study Area (BSA) (CAL-IPC 2021). Cal-IPC categorizes non-native invasive plants into three categories of overall negative ecological impact in California: High, Moderate, and Limited. Invasive species found in the RSA with a Cal-IPC rating of “High” include seven species, 20 species with a rating of “Moderate,” and 18 species with a rating of “Limited.” The Project could result in the spread of invasive species during Project construction through ground-disturbing activities, improper disposal of graded and excavated soils on-or off-site, or landscaping with invasive species. To prevent the spread of invasive species, Caltrans Standard Specification 14-6.05A(1) would be included in the contract. Section 14-6.05A(1) includes specifications for preventing the introduction and spread of invasive species to and from the job site. Therefore, the potential for spread of invasive species is very low with implementation of Caltrans Standard Specifications. Therefore, the Project is not expected to result in cumulatively considerable impacts related to invasive species.

2.4.4 Resources Evaluated for Cumulative Impacts

The following resources have been evaluated for cumulative impacts that would result from implementation of the Project:

- Parks and Recreation
- Growth
- Environmental Justice

- Utilities and Emergency Services
- Traffic and Transportation
- Visual and Aesthetics
- Cultural Resources
- Hydrology and Flood Plain
- Water Quality
- Geology/Soils/Seismic/Topography
- Paleontology
- Hazardous Waste or Materials
- Air Quality
- Noise
- Energy
- Natural Communities
- Wetlands and Other Waters
- Animal Species
- Threatened and Endangered Species

2.4.5 Resource Study Area

The study area was selected to identify other current or reasonably foreseeable future actions. The study area is generally bounded by the I-80 corridor between PMs 40.7 and 44.7 in Solano County, between PMs 0.00 and 11.72 in Yolo County, and between PMs 0.00 and 1.36 in Sacramento County; and US-50 between PMs 0.00 and 3.12 in Yolo County and between PMs 0.00 and 0.617 in Sacramento County. The boundaries of the study area were delineated by reviewing the area within a.5- to 4-mile radius of the Project area, and then adjusting the boundaries based on major roadways and land use/neighborhood boundaries.

The geographic boundaries of the RSA for each resource were considered by the Project study area and the study areas delineated by each technical report prepared for the Project. Therefore, a unique RSA was identified for each resource, rather than a single consolidated study area and is defined for each resource in the following sections.

2.4.5.1 Parks and Recreation

The analysis in this section is based on the Community Impact Assessment completed for the Project (Caltrans 2023b) and the Section 4(f) evaluation (Caltrans 2023d).

Resource Study Area

The RSA for Parks and Recreation is consistent with the cumulative study area as described in section 2.4.5, plus a 1,000-foot buffer. The RSA includes the population most likely to experience direct impacts associated with the Project's direct physical improvements.

Cumulative Impacts

Current and reasonably foreseeable future actions could result in land use activities that would result in impacts on parks and recreation during construction and operation. Of the transportation projects within the RSA, the construction timing for Yolo Pavement Rehabilitation Project (T-1) and Richards Boulevard / Olive Drive Circulation Improvements (T-5) could overlap with the Project. Of the development projects within the RSA, the construction timing for River Oaks Phase (D-8), Bell Avenue Warehouses Project (D-9), and Bretton Woods (D-12), and UC Davis Long Range Development Plan (D-13) could overlap with Project construction. Land use and transportation plans may also include planned and programmed projects that overlap with Project construction.

All Build Alternatives would include improvements to bike infrastructure, which would provide several benefits to the community, including enhancing the safety and accessibility of bicycle travel in the area, potentially reducing traffic congestion, air pollution, and greenhouse gas emissions. The improvements include replacing and extending existing bicycle pathways, improving crosswalks and signage, and constructing a new bike path extension. These benefits would lead to safer and more accessible transportation options, improved public health, and recreational opportunities for the community. Project construction and operation would have positive permanent cumulative effects due to the improvements made to bicycle/pedestrian infrastructure within the RSA.

The Project in conjunction with other projects would contribute to temporary impacts on parks and recreational facilities during construction activities, such as reduced access, loss of parking, local road closures, localized air quality impacts, and increased noise and vibration levels. These temporary impacts could affect public enjoyment of the resources, but standard BMPs, such as temporary detours, would be provided for any closed recreational trails or walkways. Changes in noise levels experienced by park and recreational facility users due to project operation would be barely perceptible and consistent with existing conditions. Similarly, there would be no perceptible long-term changes in air quality at parks and recreational facilities resulting from project operation. Future projects may require right-of-way acquisitions from parks and recreation facilities which may contribute to cumulative impacts; however, the Project does not require additional right-of-way acquisitions from parks and recreation facilities. As a result, the Project, in conjunction with related projects, would not result in cumulatively considerable permanent impacts to parks and recreation.

Human Environment Section 2.1.3 states that no AMMs would be required for parks and recreation and no additional AMMs are required for cumulative impacts.

2.4.5.2 Growth

The analysis in this section is based on the Community Impact Assessment completed for the Project (Caltrans 2023b).

Resource Study Area

The RSA for Growth is consistent with the cumulative study area as described in section 2.4.5, plus a 1,000-foot buffer. The RSA includes the population most likely to experience direct impacts associated with the Project’s direct physical improvements.

Cumulative Impacts

Current and reasonably foreseeable future actions could result in land use activities that would result in impacts on growth during construction and operation. Of the transportation projects within the RSA, the construction timing for Yolo Pavement Rehabilitation Project (T-1) and Richards Boulevard / Olive Drive Circulation Improvements (T-5) could overlap with the Project. Of the development projects within the RSA, the construction timing for River Oaks Phase (D-8), Bell Avenue Warehouses Project (D-9), and Bretton Woods (D-12), and UC Davis Long Range Development Plan (D-13) could overlap with Project construction. Land use and transportation plans may also include planned and programmed projects that overlap with Project construction.

The enhancements planned in Build Alternatives 2 through 5 would help accommodate planned growth on a regional level. However, these alternatives are not anticipated to improve opportunities for growth or provide new access to previously unserved areas. New residential development along the I-80 corridor is limited by floodplain conditions, long-term wildlife refuge and agricultural preserves, and built-out conditions in city limits. Improving travel times and capacity along I-80 is not expected to stimulate growth into nearby areas where development is not planned, as other factors such as market conditions and local land use policies have a greater influence on land use change than roadway capacity. Furthermore, new development in the RSA would occur in areas already planned for growth, with smart growth policies prioritizing infill and redevelopment projects. Planned new development in previously undeveloped or agricultural areas is limited by land use policies, agricultural preserves, and floodplains.

Therefore, the Project's contribution to permanent and temporary cumulative impacts on growth would be minimal. The Project's contribution to temporary cumulative impacts would also cease following construction. As a result, the Project, in conjunction with related projects, would not result in cumulatively considerable permanent growth impacts.

Human Environment Section 2.1.5 states that no AMMs would be required for growth and no additional AMMs are required for cumulative impacts.

Community Facilities and Services

The information in this section is based on the Community Impact Assessment completed for the Project (Caltrans 2023b).

Resource Study Area

The RSA for community facilities, utilities, and emergency services includes the Project limits, plus a 1,000-foot buffer. The RSA includes 20.8 miles along the I-80 corridor between Kidwell Road and the Solano/Yolo county line, between the Solano/Yolo county line and the Yolo/Sacramento county line, and between the Yolo/Sacramento county line and West El Camino Avenue; and on the US-50 corridor between the I-80/I-50 interchange and the Yolo/Sacramento county line and between the Yolo/Sacramento county line and the US-50/I-5 interchange.

Cumulative Impacts

Community Facilities

Current and reasonably foreseeable future actions could result in activities that would result in impacts on community facilities during construction and operation. Of the transportation projects within the RSA, the construction timing for Yolo Pavement Rehabilitation Project (T-1) and Richards Boulevard / Olive Drive Circulation Improvements (T-5) could overlap with the Project. Of the development projects within the RSA, the construction timing for River Oaks Phase (D-8), Bell Avenue Warehouses Project (D-9), and Bretton Woods (D-12), and UC Davis Long Range Development Plan (D-13) could overlap with Project construction.

It is anticipated that several of the foreseeable projects may require right-of-way acquisitions, resulting in long-term impacts on community amenities. As a result, these significant transportation projects may lead to cumulative impacts on community facilities that could persist over time. Moreover, the relevant projects planned for construction at the same time as the Project may cause temporary impacts, such as access difficulties, reduced visual aesthetics, air pollution, and noise that could impact community facilities Therefore, the additional projects in conjunction with the Project may contribute to temporary cumulative impacts on community facilities. However, they would not be anticipated to result in cumulatively considerable permanent impacts.

Human Environment Section 2.1.8 states that no AMMs would be required for community facilities and no additional AMMs would be required for cumulative impacts.

Utilities

Current and reasonably foreseeable future actions could result in activities that would result in impacts on utilities during construction and operation. Of the transportation projects within the RSA, the construction timing for Yolo Pavement Rehabilitation Project (T-1) and Richards Boulevard / Olive Drive Circulation Improvements (T-5) could overlap with the Project. Of the development projects within the RSA, the construction timing for River Oaks Phase (D-8), Bell Avenue Warehouses Project (D-9), and Bretton Woods (D-12), and UC Davis Long Range Development Plan (D-13) could overlap with Project construction.

The Project would comply with Caltrans standards and involve coordination with utility providers to minimize temporary construction impacts. In addition, utilities would be restored upon completion of utility relocation activities. The Project would comply with Caltrans standards and coordinate with utility providers; therefore, the Project's contribution to temporary cumulative impacts on utilities would be substantially minimized. In addition, the Project's contribution to temporary cumulative impacts would cease following construction. Each relevant project would be required to consider avoidance, minimization, and/or mitigation measures to reduce impacts on utilities and service systems. Therefore, the Project, in conjunction with related projects, would not result in cumulatively considerable impacts on utilities and service systems.

Human Environment Section 2.1.8 states that no AMMs would be required for utilities and no additional AMMs would be required for cumulative impacts.

Emergency Services

Current and reasonably foreseeable future actions could result in activities that would result in impacts on community facilities during construction and operation. Of the transportation projects within the RSA, the construction timing for Yolo Pavement Rehabilitation Project (T-1) and Richards Boulevard / Olive Drive Circulation Improvements (T-5) could overlap with the Project. Of the development projects within the RSA, the construction timing for River Oaks Phase (D-8), Bell Avenue Warehouses Project (D-9), and Bretton Woods (D-12), and UC Davis Long Range Development Plan (D-13) could overlap with Project construction.

Construction activities of the relevant projects, in conjunction with Project, could result in traffic delays that could affect the ability of fire, law enforcement, and emergency service providers to meet response-time goals. However, construction of the Build Alternatives would include implementation of a TMP and coordination with emergency service providers to minimize temporary construction impacts. The cumulative impacts on emergency services would be temporary and each project would be required to consider avoidance, minimization, and/or mitigation measures to reduce temporary impacts. With implementation of these measures, the Project's contribution to temporary cumulative impacts on emergency services would be substantially minimized. In addition, the Project's contribution to temporary cumulative impacts would cease following construction. Therefore, the Project, in conjunction with related projects, would not result in cumulatively considerable impacts on emergency services.

Human Environment Section 2.1.8 states that no AMMs would be required for emergency services and no additional AMMs would be required for cumulative impacts.

2.4.5.3 Environmental Justice and Equity

The information in this section is based on the Community Impact Assessment completed for the Project (Caltrans 2023b).

Resource Study Area

The RSA for environmental justice consists of 37 census blocks surrounding the Project study area. The SACOG Planning Area is used as a regional comparison.

Cumulative Impacts

Current and reasonably foreseeable future actions could result in activities that would result in impacts on utilities during construction and operation. Of the transportation projects within the RSA, the construction timing for Yolo Pavement Rehabilitation Project (T-1) and Richards Boulevard / Olive Drive Circulation Improvements (T-5) could overlap with the Project. Of the development projects within the RSA, the construction timing for River Oaks Phase (D-8), Bell Avenue Warehouses Project (D-9), and Bretton Woods (D-12), and UC Davis Long Range Development Plan (D-13) could overlap with Project construction.

Several of the relevant projects did not have environmental documents available to determine potential impacts on environmental justice populations in the RSA. There is potential that relevant projects could result in environmental effects that could result in disproportionately high and adverse effects on minority or low-income populations. The relevant projects, as listed above, that would be constructed within the Project construction period could result in temporary construction impacts related to access, visual/aesthetics, air quality, and noise that could result in disproportionately high and adverse effects on minority or low-income populations. While the Project would also contribute to temporary construction impacts, these impacts would not be disproportionately borne on environmental justice communities and would affect all adjacent communities. The Project's construction impacts would be minimized by adhering to Caltrans' standard specifications and BMPs for noise abatement and fugitive dust control. Each relevant project would also be required to implement measures to minimize temporary impacts on environmental justice and equity. Therefore, the Project would not result in temporary cumulatively considerable impacts on environmental justice and equity.

As discussed above, Build Alternatives 2 through 7 would improve traffic conditions, to varying degrees, on I-80/US-50. Although the congestion relief and enhanced accessibility associated with the Project would benefit all I-80/US-50 travelers, environmental justice travelers may not realize the full benefit from Build Alternatives 3 through 5 because of tolling. Relevant projects have the potential to result in disproportionately high and adverse effects on environmental justice communities. Each relevant project would be subject to approval and be required to consider these impacts and provide measures to avoid or minimize impacts. Therefore, the Project would not result in permanent cumulatively considerable impacts on environmental justice and equity.

The AMMs in Human Environment Section 2.1.7 would be implemented to reduce the direct effects on environmental justice and equity communities, no additional AMMs are required for cumulative impacts.

2.4.5.4 Traffic and Transportation/Pedestrian and Bicycle Facilities

The analysis in this section is based on the Draft Travel Demand Modeling Report (TDMR) (Fehr & Peers 2021), Draft TMP Data Sheet (Caltrans 2021e) and the Draft Pedestrian and Bicyclist Travel Impact Assessment prepared for the Project (Caltrans 2021a).

Resource Study Area

The RSA for traffic, transportation, and pedestrian and bicycle facilities is consistent with the cumulative study area as described in section 2.4.5. The RSA also includes areas required to accommodate construction activities, mobilization, staging, and access, such as city-owned areas where right-of-way acquisition and TCEs would be required. Staging areas would cover approximately 53.3 acres and be located at the I-80/West El Camino Avenue interchange, South River Road, I-80/Richards Boulevard interchange, the I-80 and SR-113 interchange, and the along Kidwell Road.

Cumulative Impacts

Construction of the relevant projects would occur either simultaneously or partially during the construction period of the Project which could increase traffic congestion and delays, potential lane closures, reduced speed-limits, staging, and detours. However, concurrent construction would be temporary, and projects would be at various stages throughout the 400 working day construction period of the Project. Each transportation project would be required to implement measures as necessary to avoid and minimize traffic impacts.

The Project is anticipated to result in permanent beneficial improvements to the Project area by reducing overall long-term traffic flow and access to highway facilities. The relevant projects are also intended to permanently improve local infrastructure by reducing traffic congestion, increasing access to transit and transportation alternatives within the RSA, and contributing to overall beneficial cumulative impacts on the area. Therefore, the Project, in conjunction with related projects, would not result in cumulatively considerable temporary impacts on traffic and transportation.

The AMMs provided in Human Environment Section 2.1.9 would be implemented to reduce the direct effects of the Build Alternatives on Traffic and Transportation/Pedestrian and Bicycle Facilities. No additional AMMs would be required for cumulative impacts.

2.4.5.5 Visual/Aesthetics

The analysis in the following section is based on the Draft Visual Impact Assessment (VIA) and the supplemental VIA prepared for the Project (Stantec Consulting Services Inc. 2022).

Resource Study Area

The RSA comprises four visual assessment units along the Project corridor as described in the VIA prepared for the Project. Each visual assessment unit (VAU) is typically defined by the limits of a particular viewshed and has its own character and visual quality and is defined as follows:

- Solano County VAU: located within the limits of Solano County from the Project's western terminus northeast along I-80 to south of the Yolo County/Davis city limits
- Davis VAU: located along I-80 from the UC Davis just south and east of the Davis city boundary and extends through Davis to the eastern limits of the city
- Yolo County VAU: located along I-80 from the eastern limits of Davis spanning the Yolo Bypass to the western limits of West Sacramento
- West Sacramento VAU: located along the I-80/US-50 corridor within the city limits of West Sacramento and Sacramento, extending from the west boundary of West Sacramento to the eastern termini of the Project.

Cumulative Impacts

Cumulative impacts are those resulting from past, present, and reasonably foreseeable future actions, combined with the potential visual impacts of this Project. For this Project, it has been determined that the following cumulative visual impacts may occur.

In combination with the Project, the Yolo Pavement Rehabilitation Project (T-1), Sac 50 Design-Build Project (T-4), City of Davis Richards Boulevard Ramps Reconfiguration Project (T-5), the I-5 Auxiliary Lanes Project, and I-5 Managed Lanes Project, would contribute to permanent cumulative visual impacts. These projects would widen highways and structures, remove existing plantings in the center median, reconfigure on/off-ramps, replace guardrails, paint structures, and impact associated vegetation. The transportation projects and proposed development of adjacent parcels would also contribute to an increase in lighting levels and glare in the area by infilling unlit open space areas and adding reflective surfaces. However, the Project would be somewhat compatible with the existing visual environment. Overall Resource Change would vary throughout the corridor, with some areas visually unchanged and other areas that would experience more noticeable visual changes.

The Project under the Build Alternatives would result in permanent visual/aesthetic impacts by making the freeway larger and more dominant in the landscape, changing views for both freeway travelers and adjacent land uses. The combined visual effect of this Project and other development projects planned, recently in construction, or currently in construction would collectively change the visual character of the region. As described in planning documents such as the General Plans for the cities of Davis, Sacramento, and West Sacramento and County RTPs, there is development anticipated within and surrounding the Project area. These plans, once implemented, would improve existing and create new/reconfigured transportation facilities as well as induce development and infill of open space areas and vacant lots within the RSA.

Approximately half of the overall corridor is within municipalities which have identified land development and urban growth patterns adjacent to the Project. Over time, the highway users and highway neighbors may experience the gradual transition of undeveloped lots, the redevelopment of existing developed lots, and the modification of transportation corridors to support these developments within the landscape. As such, the contribution of the Project is minimal in the context or visual impacts through the Project area. Permanent visual impacts would be consistent with the visual environment goals and objectives established by local and regional planning documents and ordinances.

The Project could potentially result in a cumulatively considerable visual impact if multiple projects are constructed concurrently. Nighttime construction lighting, glare, construction equipment, staging areas, demolition, and other construction-related activities from multiple projects may contribute to cumulative visual impacts. However, construction-related visual impacts would be temporary. Furthermore, to minimize potential visual impacts, the Project would implement AMMs that would incorporate aesthetic treatment design considerations to avoid visual resource removal and implement replacement planting as needed. As a result, the Project's contribution to a potential cumulative visual impact would not be cumulatively considerable.

The AMMs provided in Human Environment Section 2.1.10 would be implemented to reduce the direct effects on visual resources. No additional AMMs would be required for cumulative impacts.

2.4.5.6 Cultural Resources

The information in this section is based on the Historic Property Survey Report (Caltrans 2021j) and the Section 4(f) Report (Caltrans 2023d) prepared for the Project.

Resource Study Area

The RSA for cultural resources is defined as the Area of Potential Effects (APE). In accordance withPA Stipulation VIII.A, the APE for the Project was established in consultation with Connor Buitenhuys, Professionally Qualified Staff of Prehistoric and Historical Archaeology, and Jess Avilla, Project Manager on June 30, 2020. Although the APE is almost entirely in Caltrans ROW, five TCEs would be required along the project alignment. The APE occupies approximately 360 acres along the 9.5-mile-long Project.

Cumulative Impacts

Current and reasonably foreseeable future actions could result in land use activities that could result in impacts on cultural resources. Of the transportation projects within the RSA, the construction timing for Yolo Pavement Rehabilitation Project (T-1) and Richards Boulevard / Olive Drive Circulation Improvements (T-5) could overlap with the Project. Of the development projects within the RSA, the construction timing for River Oaks Phase (D-8), Bell Avenue Warehouses Project (D-9), and Bretton Woods (D-12), and UC Davis Long Range Development Plan (D-13) could overlap with Project construction. Land use and transportation plans may also include planned and programmed projects that overlap with Project construction.

Similar to the Project, all projects and plans listed in Table 2.4-1 that would involve ground disturbance could result in damage to or destruction of previously undiscovered subsurface archaeological deposits or unmarked burials. The related projects would be required to conduct applicable surveys and take necessary precautions if determined to be in an area known to have potential for cultural resources. All related projects would also be required to consider avoidance, minimization, and/or mitigation measures. As a result, the Project, in conjunction with related projects, would not result in cumulatively considerable impacts on cultural resources.

The AMMs provided in the Human Environment Section 2.1.11 would be implemented to reduce the direct effects of the Build Alternatives on cultural resources. No additional AMMs would be required for cumulative impacts.

2.4.5.7 Hydrology and Floodplains

The information in this section is based on the Floodplain Hydraulic Study (FHS) prepared for the Project (Wood Rodgers Inc. 2021).

Resource Study Area

The RSA for hydrology and floodplains is consistent with the cumulative study area as described in Section 2.4.5. The RSA also includes the Project area as depicted on the following FEMA FIRM panel numbers:

- 06067C0157J and 06067C0160J for Sacramento County, California and Incorporated Areas dated 06/16/2015.
- 0607280005B for City of West Sacramento, California, Yolo County dated 01/19/1995.
- •06095C0075E and 06095C0100E for Solano County, California and Incorporated Areas dated 05/04/2009.
- 06113C0610G, 06113C0611G, 06113C0620G, and 06113C0630G for Yolo County, California and Incorporated Areas dated 06/18/2010.

Cumulative Impacts

Current and reasonably foreseeable future actions could result in land use activities that could result in impacts on hydrology and floodplains. Of the transportation projects within the RSA, the construction timing for Yolo Pavement Rehabilitation Project (T-1) and Richards Boulevard / Olive Drive Circulation Improvements (T-5) could overlap with the Project. Of the development projects within the RSA, the construction timing for River Oaks Phase (D-8), Bell Avenue Warehouses Project (D-9), and Bretton Woods (D-12), and UC Davis Long Range Development Plan (D-13) could overlap with Project construction. Land use and transportation plans may also include planned and programmed projects that overlap with Project construction.

All relevant projects would be required to determine any potential impacts on the existing floodplain and document any floodplain impacts. Relevant projects would also be required to undergo review by the applicable Lead Agency for compliance with National Pollutant Discharge Elimination System (NPDES) permits for construction, operation, and maintenance activities as well as compliance with local urban stormwater and non-stormwater runoff ordinances for temporary and permanent impacts. Therefore, in conjunction with relevant projects, the Project would not result in a cumulatively considerable impact on hydrology and floodplains.

The AMMs provided in the Physical Environment Section 2.2.1 would be implemented to reduce the direct effects of the Build Alternatives on hydrology and floodplains. No additional AMMs would be required for cumulative impacts.

2.4.5.8 Water Quality and Storm Water Runoff

The analysis in this section is based on the Water Quality Assessment (Caltrans 2020b) and the Floodplain Hydraulics Study (Wood Rodgers Inc. 2021) that were prepared for the Project.

Resource Study Area

The RSA for water quality and storm water runoff includes the entire Solano, Yolo, and Sacramento watersheds. The RSA includes the areas of Project improvements, maintenance access, soundwalls, and other peripheral features owned and maintained by Caltrans, and the cities of Davis, West Sacramento and Sacramento. The RSA also includes areas required to accommodate construction activities, mobilization, staging, and access, such as city-owned right-of-way acquisition and TCEs.

Cumulative Impacts

Development of the Project and the reasonably foreseeable projects within the RSA may have the potential to create sources of short-term and long-term water pollution. Each project would be required to mitigate impacts by providing stormwater pollution prevention measures. Additionally, adverse cumulative water quality impacts to resources in this Project area could result from residential, commercial, agricultural, and highway development. The Project would involve short-term construction activities that would have the potential to degrade water quality in downstream water bodies. While the Project would not change existing land uses in the area, mitigation is proposed that would require implementation of various construction and operational water quality control measures that would prevent the release of pollutants into downstream waterways.

Projects T-1 and T-2 would correct the wash-out and ponding drainage issues that are occurring on both sides of the Bryte Bend Bridge resulting in permanent beneficial impacts on water quality in the Project area (Wood Rodgers Inc. 2021).

It is anticipated that the Project in combination with the projects listed in Table 2.4-1 would contribute to temporary adverse cumulative impacts on water quality. However, each project that disturbs one or more acres would comply with NPDES and install BMPs during construction to minimize potential adverse impacts on water resources.

The AMMs provided in the Physical Environment Section 2.2.2 would be implemented to reduce the direct effects of the Build Alternatives on water quality and stormwater runoff. No additional AMMs would be required for cumulative impacts.

2.4.5.9 Geology/Soils/Seismic/Topography

The information in this section is based on the Structure Preliminary Geotechnical Report for I-80 HOV Connector RW No. 1 & 2 (Caltrans 2021f). Structure Preliminary Geotechnical Report for Richards Blvd. OC RW No. 3 (Caltrans 2021d), and Structure Preliminary Geotechnical Report for I-80 HOV Connector (Caltrans 2020c) prepared for the Project.

Resource Study Area

The RSA for geology/solid/seismic/topography comprises the Project study area which is approximately 20.8 miles on the I-80 corridor between PMs 40.7 and 44.7 in Solano County, between PMs 0.00 and 11.72 in Yolo County, and between PMs 0.00 and 1.36 in Sacramento County; on the US-50 corridor between PMs 0.00 and 3.12 in Yolo County and between PMs 0.00 and 0.617 in Sacramento County.

The RSA includes the areas of Project improvements, construction staging areas, Project-related signage, maintenance access, sound walls, stormwater features, and other peripheral features owned and maintained by Caltrans.

Cumulative Impacts

Current and reasonably foreseeable future actions could result in land use activities that could result in impacts on geology, soils, seismic, and topography. Of the transportation projects within the RSA, the construction timing for Yolo Pavement Rehabilitation Project (T-1) and Richards Boulevard / Olive Drive Circulation Improvements (T-5) could overlap with the Project. Of the development projects within the RSA, the construction timing for River Oaks Phase (D-8), Bell Avenue Warehouses Project (D-9), and Bretton Woods (D-12), and UC Davis Long Range Development Plan (D-13) could overlap with Project construction. Land use and transportation plans may also include planned and programmed projects that overlap with Project construction. Similar to the Project, the relevant projects have the potential to impact water quality temporarily and permanently; however, all projects would be required to implement measures and BMPs to reduce impacts on geology, soils, seismic, and topography.

Each relevant project would be subject to geotechnical analysis and cannot be constructed unless each project is determined to be geotechnically feasible. Similar to the Project, the relevant projects would be designed and built to current standards. Construction activities for the Project would increase the possibility for erosion, slope instability from seismic shaking, and soil expansion/collapse. Similar to the Project, relevant projects would be required to comply with seismic requirements of the California Building Code. The potential for landslides would be considered when planning grading or excavation activities in areas known to be prone to landslides. Relevant projects would also be required to implement measures as necessary if they would result in impacts on geology or soils. Therefore, in conjunction with relevant projects, the Project would not result in a cumulatively considerable impact on geology, soils, seismic, and topography.

The AMMs provided in the Physical Environment Section 2.2.3 would be implemented to reduce the direct effects of the Build Alternatives on Geology/Soils/Seismic/Topography. No additional AMMs would be required for cumulative impacts.

2.4.5.10 Paleontology

This information in this section is based on the PIR prepared for the Project (Caltrans 2021c).

Resource Study Area

The RSA for paleontology comprises the Project study area which is approximately 20.8 miles on the I-80 corridor between PMs 40.7 and 44.7 in Solano County, between PMs 0.00 and 11.72 in Yolo County, and between PMs 0.00 and 1.36 in Sacramento County; on the US-50 corridor between PMs 0.00 and 3.12 in Yolo County and between PMs 0.00 and 0.617 in Sacramento County. The RSA includes the areas of Project improvements, construction staging areas, Project-related signage, maintenance access, sound walls, stormwater features, and other peripheral features owned and maintained by Caltrans.

Cumulative Impacts

Specific impacts on paleontological resources that would result from other relevant projects in the RSA were not readily available for all of the projects. However, the projects listed in Table 2.4-1 would likely require earth-moving activities over a large cumulative surface area with the potential to encounter paleontological resources. Therefore, these relevant projects may contribute to permanent cumulative impacts on paleontological resources. Any impact on paleontological resources would be permanent and irreversible. Consequently, there would be no temporary adverse impact under any of the relevant projects.

As discussed above, the Project has the potential to impact paleontological resources from earth-moving activities greater than 4 feet in depth during Project construction. However, the Project would implement appropriate mitigation measures that would be identified in Paleontological Evaluation Report (PER) for the recovery and treatment of any fossil remains exposed by those earth-moving activities. This report will be prepared during the plans, specifications and estimate (PS&E) development phase when more design details are known.

Any impact on paleontological resources would be permanent and irreversible. With implementation of measures within the PER, the Project's contribution to permanent cumulative impacts on paleontological resources would be substantially minimized.

The AMMs provided in the Physical Environment Section 2.2.4 would be implemented to reduce the direct effects of the Build Alternatives on Paleontological resources. No additional AMMs would be required for cumulative impacts.

2.4.5.11 Hazardous Waste or Materials

The analysis in this section is based on the Hazardous Waste Initial Site Assessment (ISA) prepared for the Project (Caltrans 2021b).

Resource Study Area

The RSA for hazardous waste and materials includes the Project area which is approximately 20.8 miles on the I-80 corridor between PMs 40.7 and 44.7 in Solano County, between PMs 0.00 and 11.72 in Yolo County, and between PMs 0.00 and 1.36 in Sacramento County; on the US-50 corridor between PMs 0.00 and 3.12 in Yolo County and between PMs 0.00 and 0.617 in Sacramento County. The RSA includes the areas of Project improvements, maintenance access, soundwalls, stormwater features, and other peripheral features owned and maintained by Caltrans.

Cumulative Impacts

As mentioned above there are at least 11 relevant projects that could contribute to impacts from hazardous waste and materials. As each of the identified projects are related to transportation, bicycle and pedestrian, or development, it is anticipated that impacts would occur during construction and would be temporary. Hazards may occur from construction materials, fuels, lubricants, solvents, and other possible contaminants during construction. Contaminated soil or groundwater may also be encountered during Project construction. Construction workers would be required to take appropriate precautions to minimize their exposure, which includes using the appropriate protective clothing and equipment.

With implementation of avoidance and minimization measures listed in the Physical Environment Section 2.2.5, the contribution to temporary adverse cumulative impacts related to hazardous waste or materials would be substantially minimized. In addition, contribution to temporary cumulative impacts would cease following construction.

The operation and maintenance of the relevant projects would not introduce new sources of hazardous wastes or materials.

The AMMs provided in the Physical Environment Section 2.2.5 would be implemented to reduce the direct effects of the Build Alternatives on Hazardous Waste or Materials. No additional AMMs would be required for cumulative impacts.

2.4.5.12 Air Quality

The information in this section is based on the Air Quality Report (Caltrans 2023a) completed for the Project.

Resource Study Area

The RSA for permanent cumulative impacts on air quality includes the Sacramento Valley Air Basin (SVAB), which includes Sacramento, Shasta, Tehama, Butte, Glenn, Colusa, Sutter, Yuba, Yolo, and parts of Solano and Placer counties.

The RSA for temporary cumulative impacts on air quality includes the Project study area, which includes 20.8 miles along the I-80 corridor between Kidwell Road and the Solano/Yolo county line, between the Solano/Yolo county line and the Yolo/Sacramento county line, and between the Yolo/Sacramento county line and West El Camino Avenue; and on the US-50 corridor between the I-80/I-50 interchange and the Yolo/Sacramento county line and between the Yolo/Sacramento county line and the US-50/I-5 interchange. The RSA includes the areas of Project improvements, maintenance access, soundwalls, stormwater features, and other peripheral features owned and maintained by Caltrans.

Cumulative Impacts

Current and reasonably foreseeable future actions could result in land use activities that would result in air quality impacts on adjacent sensitive receptors during construction and operation. Of the transportation projects within the RSA, the construction timing for Yolo Pavement Rehabilitation Project (T-1) and Richards Boulevard / Olive Drive Circulation Improvements (T-5) could overlap with the Project. Of the development projects within the RSA, the construction timing for River Oaks Phase (D-8), Bell Avenue Warehouses Project (D-9), and Bretton Woods (D-12), and UC Davis Long Range Development Plan (D-13) could overlap with Project construction. Land use and transportation plans may also include planned and programmed projects that overlap with Project construction.

During construction of the Project, there would be an increase in localized air quality and GHG impacts due to emissions from generation of dust and equipment exhaust. Control measures would be implemented as specified in Caltrans 2018 Standard Specifications Section 10-5 “Dust Control,” Section 14-9 “Air Quality” and Section 18 “Dust Palliatives.” Similar to the Project, all relevant projects would be required to comply with applicable air quality standards and implement BMPs as necessary to avoid and minimize impacts. Therefore, in conjunction with relevant projects, the Project would not result in a cumulatively considerable impact on temporary air quality and GHG emissions.

Physical Environment Section 2.2.6 states that no AMMs would be required for air quality and no additional AMMs are required for cumulative impacts.

2.4.5.13 Noise and Vibration

The information in this section is based on the Noise Study Report (NSR) completed for the Project (Caltrans 2022).

Resource Study Area

The RSA for noise and vibration consist of the Noise Analysis Areas as described in the NSR prepared for the Project. The analysis focuses on locations with defined outdoor activity areas, such as residential backyards, patios and balconies, common use areas at multifamily residences, outdoor sports and recreation areas, outdoor dining areas of restaurants, and school playgrounds. The RSA includes the areas of Project improvements, maintenance access, sound barriers, stormwater features, and other peripheral features owned and maintained by Caltrans.

Cumulative Impacts

The results of this analysis indicate that past, current, and reasonably foreseeable actions, in combination with the Project, are contributing to adverse cumulative impacts on noise.

Current and reasonably foreseeable future actions could result in land use activities that would increase the typical noise and vibration levels and result in impacts on adjacent sensitive receptors during construction and operation. The Project is anticipated to begin in spring of 2025, the following projects within the RSA may overlap in construction time frame of the Project, the Richards Boulevard / Olive Drive Circulation Improvements 03-0H360 (T-5), and the Yol 80 Davis 80 Rehabilitation Project 03-2J260 (T-9). Project construction of multiple other projects listed in Table 2.4-1 may overlap with the Project, however, the timelines are not yet determined. Land use and transportation plans may also include planned and programmed projects that could potentially overlap with Project construction.

The NSR identified three additional development projects within 500 feet of the Project footprint, the University Research Park development, the Plaza 2555 development, and the 3820 Chiles Road Apartments development. It was determined that the development projects would not contribute cumulatively to noise within the Project area.

The Project would not result in operational noise impacts with implementation of noise mitigation and the installation of the recommended sound barrier. Additionally, vibration levels are not anticipated to increase largely above existing conditions. Therefore, the Project would not contribute to permanent cumulative impacts on noise and vibration.

During construction of the Project, there would be an increase in noise and vibration due to the use of construction equipment. BMPs would be implemented to avoid and/or minimize impacts, which may include the following: providing that equipment is properly maintained and equipped with mufflers, limiting idling, installing temporary noise barriers, and locating staging and queuing areas away from noise-sensitive land uses. All relevant projects would be required to comply with local noise ordinances and implement BMPs as necessary to avoid and minimize temporary impacts on noise. Therefore, in conjunction with relevant projects, the Project would not result in a cumulatively considerable impact on noise and vibration.

The AMMs provided in the Physical Environment Section 2.2.7 would be implemented to reduce the direct effects of the Build Alternatives on noise and vibration. No additional AMMs would be required for cumulative impacts.

2.4.5.14 Energy

The information in this section is based on the Energy Memorandum (Caltrans 2023c) completed for the Project.

Resource Study Area

The RSA for energy is the overall SACOG region. SACOG is a designated Metropolitan Planning Organization that encompasses 28 cities and counties in the Sacramento region. Land use change and the transportation system would influence the demand for future energy development or the location and need for new or additional energy infrastructure across the Sacramento region. The provision of energy can be linked to jurisdictions, but often service providers and their infrastructure cover large areas. Therefore, it is necessary to consider the Sacramento region as a whole and the overall amount of development that would generate additional pressure and demand on energy use and generation facilities.

Cumulative Impacts

Current and reasonably foreseeable future actions could result in land use activities that would result in increased energy consumption during construction and operation. Of the transportation projects within the RSA, the construction timing for Yolo Pavement Rehabilitation Project (T-1) and Richards Boulevard / Olive Drive Circulation Improvements (T-5) could overlap with the Project. Of the development projects within the RSA, the construction timing for River Oaks Phase (D-8), Bell Avenue Warehouses Project (D-9), and Bretton Woods (D-12), and UC Davis Long Range Development Plan (D-13) could overlap with Project construction. Land use and transportation plans may also include planned and programmed projects that overlap with Project construction.

The demands on energy associated with the Project would be temporary and cease with completion of construction-related activities and appropriate BMPs would be implemented to reduce the demand on energy. According to the Energy Memorandum, energy consumption associated with Build Alternatives 2 through 7 represents a small demand on local and regional fuel and supplies that would be accommodated by local energy suppliers (Caltrans 2023c). Development of the projects listed in Table 2.4-1 would be required to assess project-specific impacts related to energy consumption and include design measures consistent with the most recent building code as it relates to energy use. Therefore, in conjunction with relevant projects, the Project would not result in a cumulatively considerable impact on energy.

The AMMs provided in the Physical Environment Section 2.2.7 would be implemented to reduce the direct effects of the Build Alternatives on energy. No additional AMMs would be required for cumulative impacts.

2.4.5.15 Natural Communities

The analysis in this section is based on the Natural Environment Study (NES) prepared for the Project (Caltrans. 2023).

Resource Study Area

The RSA for natural communities is consistent with the BSA established for the Project, which is located in the counties of Solano, Yolo, and Sacramento and is approximately 1,137-acres in size. The RSA includes all areas needed for the currently proposed Project improvements and ancillary construction areas (e.g., staging areas, access roads).

Cumulative Impacts

Current and reasonably foreseeable future actions could result in land use activities that could result in impacts on Sensitive Natural Communities. Of the transportation projects within the RSA, the construction timing for Yolo Pavement Rehabilitation Project (T-1) and Richards Boulevard / Olive Drive Circulation Improvements (T-5) could overlap with the Project. Of the development projects within the RSA, the construction timing for River Oaks Phase (D-8), Bell Avenue Warehouses Project (D-9), and Bretton Woods (D-12), and UC Davis Long Range Development Plan (D-13) could overlap with Project construction. Land use and transportation plans may also include planned and programmed projects that overlap with Project construction.

As discussed above, the Project would result in permanent or temporary impacts on Sensitive Natural Communities. The Project would include standard measures to reduce impacts on Sensitive Natural Communities. Information on impacts on Sensitive Natural Communities were not available for several of the current and reasonably foreseeable future actions. However, if these relevant projects result in impacts on the same Sensitive Natural Communities that would be impacted by the Project, there could be a cumulative impact. Similar to the Project, relevant projects that would result in impacts on Sensitive Natural Communities, as defined by CDFW, would be required to conduct biological surveys and evaluation as applicable. If a relevant project would result in impacts on Sensitive Natural Communities, that project would be required to implement measures as required to avoid and minimize impacts. Therefore, in conjunction with relevant projects, the Project would not result in a cumulatively considerable impact on Sensitive Natural Communities.

The AMMs provided in Biological Section 2.3.1 would be implemented to reduce the direct effects of the Build Alternatives on Sensitive Natural Communities. While the Project would not be expected to have cumulative impacts on Sensitive Natural Communities, implementation of the listed measures would avoid direct impacts on individuals and protect habitat to the extent practicable. No additional AMMs would be required for cumulative impacts.

2.4.5.16 Wetlands and Other Waters

The analysis in this section is based on the NES (Caltrans 2023), Aquatic Resources Survey Report and Preliminary Jurisdictional Assessment (Stantec Consulting Services Inc. 2021), and the Water Quality Assessment (Caltrans 2020b) prepared for the Project.

Resource Study Area

The RSA for wetlands and other waters is consistent with the BSA established for the Project, which is located in the counties of Solano, Yolo, and Sacramento and is approximately 1,137-acres in size. The RSA includes all areas needed for the currently proposed Project improvements and ancillary construction areas (e.g., staging areas, access roads).

Cumulative Impacts

Current and reasonably foreseeable future actions could result in land use activities that could result in impacts on wetlands and other waters. Of the transportation projects within the RSA, the construction timing for Yolo Pavement Rehabilitation Project (T-1) and Richards Boulevard / Olive Drive Circulation Improvements (T-5) could overlap with the Project. Of the development projects within the RSA, the construction timing for River Oaks Phase (D-8), Bell Avenue Warehouses Project (D-9), and Bretton Woods (D-12), and UC Davis Long Range Development Plan (D-13) could overlap with Project construction. Land use and transportation plans may also include planned and programmed projects that overlap with Project construction.

As discussed above, the Project would result in minor temporary impacts on wetlands and other waters. The Project would comply with the requirements of Nationwide Permit No. 14 for Linear Transportation Projects. A preconstruction notification would be required due to the discharge of fill into a wetland. In addition, a Section 401 Water Quality Certification would be obtained from the RWQCB. The Project would include avoidance and minimization measures and would follow all regulatory requirements to reduce impacts on wetlands and other waters. Wetland and aquatic resource delineations were not available for several of the current and reasonably foreseeable future actions. Similar to the Project, all relevant projects would be required to conduct delineations of aquatic resources under the guidance of the USACE, CDFW, and/or the RWQCB, as applicable. If a relevant project would result in impacts on wetlands or other waters, that project would be required to consult with the applicable agencies and implement measures as required to avoid and minimize impacts. Therefore, in conjunction with relevant projects, the Project would not result in a cumulatively considerable impact on wetlands and other waters.

The AMMs provided in the Biological Environment Section 2.3.2 would be implemented to reduce the direct effects of the Build Alternatives on wetlands and other waters. No additional AMMs would be required for cumulative impacts.

2.4.5.17 Animal Species

The analysis in this section is based on the NES prepared for the Project (Caltrans 2023).

Resource Study Area

The RSA for animal species is consistent with the BSA established for the Project, which is located in the counties of Solano, Yolo, and Sacramento and is approximately 1,137-acres in size. The RSA includes all areas needed for the currently proposed Project improvements and ancillary construction areas (e.g., staging areas, access roads).

Cumulative Impacts

Current and reasonably foreseeable future actions could result in land use activities that could result in impacts on animal species. Of the transportation projects within the RSA, the construction timing for Yolo Pavement Rehabilitation Project (T-1) and Richards Boulevard / Olive Drive Circulation Improvements (T-5) could overlap with the Project. Of the development projects within the RSA, the construction timing for River Oaks Phase (D-8), Bell Avenue Warehouses Project (D-9), and Bretton Woods (D-12), and UC Davis Long Range Development Plan (D-13) could overlap with Project construction. Land use and transportation plans may also include planned and programmed projects that overlap with Project construction.

The relevant projects that would be constructed within the Project construction period could result in permanent and temporary impacts on animal species if these projects would require vegetation removal, grubbing and grading, pile driving, operation of vehicles, heavy equipment operation, and earth-moving operations. Each relevant project would be required to implement avoidance, minimization, and mitigation measures as necessary. Therefore, in conjunction with relevant projects, the Project would not result in a cumulatively considerable impact on animal species.

The AMMs provided in the Biological Environment Section 2.3.4 would be implemented to reduce the direct effects of the Build Alternatives on animal species. No additional AMMs would be required for cumulative impacts.

2.4.5.18 Threatened and Endangered Species

The analysis in this section is based on the NES prepared for the Project (Caltrans 2023).

Resource Study Area

The RSA for threatened and endangered species is consistent with the BSA established for the Project, which is located in the counties of Solano, Yolo, and Sacramento and is approximately 1,137-acres in size. The RSA includes all areas needed for the currently proposed Project improvements and ancillary construction areas (e.g., staging areas, access roads).

Cumulative Impacts

Current and reasonably foreseeable future actions could result in land use activities that could result in impacts on threatened and endangered species through degradation of habitat. Of the transportation projects within the RSA, the construction timing for Yolo Pavement Rehabilitation Project (T-1) and Richards Boulevard / Olive Drive Circulation Improvements (T-5) could overlap with the Project. Of the development projects within the RSA, the construction timing for River Oaks Phase (D-8), Bell Avenue Warehouses Project (D-9), and Bretton Woods (D-12), and UC Davis Long Range Development Plan (D-13) could overlap with Project construction. Land use and transportation plans may also include planned and programmed projects that overlap with Project construction.

Detailed biological studies were not available for several of these projects. However, if these relevant projects result in impacts on giant garter snake, valley elderberry longhorn beetle, or Swainson's hawk, there could be a cumulative impact on these species. Similar to the Project, all relevant projects would be required to conduct biological surveys if the project or plan would be developed in an area where sensitive species may occur. If threatened and endangered species or suitable habitat is found within a project site, that project would be required to consult with the applicable agencies and implement measures as required to avoid and minimize impacts. Therefore, in conjunction with relevant projects, the Project would not result in a cumulatively considerable impact on threatened and endangered species.

The AMMs provided in the Biological Environment Section 2.3.5 would be implemented to avoid and minimize impacts on threatened or endangered species. No additional AMMs would be required for cumulative impacts.