

Chapter 4 California Environmental Quality Act (CEQA) Evaluation

4.1 Determining Significance under CEQA

The proposed project is a project by the California Department of Transportation (Department) and is subject to state and federal environmental review requirements. Project documentation, therefore, has been prepared in compliance with both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). FHWA's responsibility for environmental review, consultation, and any other action required in accordance with NEPA and other applicable Federal laws for this project is being, or has been, carried out by the Department under its assignment of responsibility pursuant to 23 U.S.C. 327. The Department is the lead agency under CEQA and NEPA.

One of the primary differences between NEPA and CEQA is the way significance is determined. Under NEPA, significance is used to determine whether an EIS, or some lower level of documentation, will be required. NEPA requires that an EIS be prepared when the proposed federal action (project) *as a whole* has the potential to "significantly affect the quality of the human environment." The determination of significance is based on context and intensity. Some impacts determined to be significant under CEQA may not be of sufficient magnitude to be determined significant under NEPA. Under NEPA, once a decision is made regarding the need for an EIS, it is the magnitude of the impact that is evaluated and no judgment of its individual significance is deemed important for the text. NEPA does not require that a determination of significant impacts be stated in the environmental documents.

CEQA, on the other hand, does require the Department to identify each "significant effect on the environment" resulting from the project and ways to mitigate each significant effect. If the project may have a significant effect on any environmental resource, then an EIR must be prepared. Each and every significant effect on the environment must be disclosed in the EIR and mitigated if feasible. In addition, the CEQA Guidelines list a number of mandatory findings of significance, which also require the preparation of an EIR. There are no types of actions under NEPA that parallel the findings of mandatory significance of CEQA. This chapter discusses the effects of the proposed project and CEQA significance.

4.2 Discussion of Significance of Impacts

Table 4-1 presents a summary of impact determinations under CEQA by resource area for the build alternatives. The impact determination shown reflects the most severe impact for each resource area; lesser impacts may also occur, and these are discussed in the appropriate section of this chapter.

Table 4-1. Summary of Impact Determinations under CEQA

Corresponding NEPA Section	Topic	Impact Determination
3.1.7	Aesthetics	Less than significant
3.1.3	Agriculture Resources	Significant
3.2.6	Air Quality	Less than significant
3.3	Biological Resources	Significant
3.1.8, 3.2.4	Cultural Resources	Less than significant
3.2.3	Geology and Soils	Less than significant
3.2.5	Hazards and Hazardous Materials	Less than significant
3.2.1, 3.2.2	Hydrology and Water Quality	Less than significant
3.1.1	Land Use and Planning	Less than significant
3.2.3	Mineral Resources	No impact
3.2.7	Noise	Less than significant
3.1.2, 3.1.4	Population and Housing	Less than significant
3.1.5	Public Services	Less than significant
3.1.1	Recreation	Less than significant
3.1.6	Transportation/ Traffic	Unavoidable significant
3.1.5	Utilities and Service Systems	Less than significant

Different agencies may use different thresholds for determining the need for mitigation. For the purpose of the impact discussions in this chapter, significance conclusions are provided in the context of CEQA and State CEQA Guidelines requirements only. The following significance conclusions are made in this chapter.

- **No impact:** This level of significance is used for impacts where there is clearly no impact.
- **Less than significant:** This level of significance is used for impacts where there would be an impact, but the degree of the impact would not meet or exceed the identified thresholds.
- **Significant:** This level of significance is used for impacts that would meet or exceed the identified thresholds but would be reduced to a less-than-significant level through the implementation of mitigation measures.
- **Unavoidable Significant:** This level of significance describes significant impacts for which mitigation to reduce the significant impact to a less-than-significant level is not available or feasible.

The thresholds for determining significance of impacts for the various resource areas are derived from the State CEQA Guidelines and professional practice and the CEQA checklist provided in Appendix A of this document. Those project effects that are considered impacts under CEQA only are fully discussed here. CEQA impacts addressed in Chapter 3 (e.g., effects on state-listed and federally listed plant and wildlife species) are summarized in this chapter. However, measures presented in Chapter 3 are considered to be incorporated into the project description, and CEQA impacts are assessed accordingly.

4.2.1 Less-than-Significant Effects of the Proposed Project

4.2.1.1 Aesthetics

Would the project have a substantial adverse effect on a scenic vista?

The project area is already developed with the major highway interchange of I-80, I-680, and SR 12. The surrounding visual environment includes a diverse array of industrial, commercial, and residential development as well as farmland and grazing land. The buildings around the existing interchange vary in height, color, size, and age. In general, the built elements around the existing interchange appear randomly placed and do not appear unified. Farmland and grazing land is dispersed between these artificial elements.

Although there are vistas of agricultural lands and rolling hills from portions of the affected roadways, in general these views would not change under any of the build alternatives. Localized views might be either obstructed or improved, depending on the site-specific changes associated with the location and the alternative. Nevertheless, considering the proposed project as a whole, there would be a less-than-significant impact on scenic vistas under all build alternatives.

Would the project substantially degrade the existing visual character or quality of the site and its surroundings?

The project area is already developed with the major highway interchange of I-80, I-680, and SR 12. The surrounding visual environment includes a diverse array of industrial, commercial, and residential development as well as farmland and grazing land. The buildings around the existing interchange vary in height, color, size, and age. In general, the built elements around the existing interchange appear randomly placed and do not appear unified. Farmland and grazing land is dispersed between these artificial elements.

The build alternatives would result in several adverse and beneficial localized changes to visual character. As depicted in many of the visual simulations, the extent of paved surface would increase. Similarly, in the vicinity of new overpasses, on- and off-ramps, utility towers, and interchange components, specific long-distance views would be obstructed. However, because the project alternatives would improve an existing interchange, as a whole they would not be out of character with the existing major highway interchange. With the incorporation of measures pertaining to landscaping, lighting, the selection of materials for the westbound truck scales, and aesthetic treatment in the design of freeway-related structures, this would be a less-than-significant impact.

Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Under both build alternatives, new lighting would be incorporated into portions of the proposed project. This could constitute a significant effect. However, such lighting would be consistent with existing freeway lighting, and adjoining land uses in areas where new lighting would be installed currently include lighting fixtures. Moreover, implementation of measures described in

Section 3.1.7—incorporation of appropriate light and glare screen measures into all new lighting facilities—will reduce this effect to a less-than-significant level.

4.2.1.2 Agricultural Resources

Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?

There are four Williamson Act parcels within the project area. Alternative C, Phase 1 would not be able to avoid the conversion of land held in Williamson Act contracts in the vicinity of the extension of Red Top Road to Business Center Drive. Alternatives B and C would affect Williamson Act parcels north of I-80 immediately east of Suisun Creek (Valine) and east of Abernathy Road. The affected portion of the Williamson Act parcels would be removed from the Williamson Act contract by cancellation upon acquisition by the Department. The remainder of the parcels would be unaffected. This impact would be less than significant.

4.2.1.3 Air Quality

Would the project conflict with or obstruct implementation of the applicable air quality plan?

The nine-county region under the jurisdiction of the BAAQMD is currently in non-attainment for both federal and state ozone standards as well as for state PM10 and PM2.5 standards. The proposed project is listed in the most recent 2035 RTP and 2009 TIP, which were found to conform with the applicable air quality plans. In addition, the project includes measures, such as limits to diesel idling and the use of cool paving surfaces, that are consistent with the control strategies described in 2005 Ozone Strategy and proposed 2009 Clean Air Plan. These strategies as well as the Department's Standard Specification to control dust and exhaust emissions during construction are described in Section 3.2.6. The project alternatives therefore meet the regional test and conform with the SIP. This impact is less than significant.

Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Construction emissions would result from grubbing and land clearing, grading and excavation, drainage/utilities/subgrade activities, paving activities, and construction workers commuting to and from the job site. Pollutant emissions would vary daily, depending on the level of activity, specific operations, and weather conditions. Construction emissions are of short duration. The design and scope of the project alternatives are the same as those described in the most recent RTP and TIP, which were found to satisfy regional conformity requirements and are consistent with the most recent regional air quality plans. Moreover, the project alternatives are consistent at the project-level conformity analysis, as none of the project alternatives would generate elevated hot spot concentrations of CO, PM10, or PM2.5. Accordingly, the project alternatives would not violate or contribute to an existing air quality violation. Implementation of standard specifications and measures to control dust and exhaust emissions during construction and measures to reduce MSAT and criteria pollutant emissions, as described in Section 3.2.6, would reduce this impact to a less-than-significant level.

Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

The design and scope of the project alternatives are the same as those in the most recent RTP and TIP, both of which were found to conform with regional air quality plans. Therefore, emissions from construction and operation of the project alternatives are consistent with regional air quality plans, and the net increase in pollutants is considered less than significant.

Would the project expose sensitive receptors to substantial pollutant concentrations?

The project alternatives would not create hotspots of CO or particulate matter and consequently would not expose sensitive receptors to substantial pollutant concentration. This impact is less than significant.

Would the project create objectionable odors affecting a substantial number of people?

Project construction and operation would not generate substantial pollutant concentrations. Consequently, the project alternatives are not expected to generate objectionable odors that would affect a substantial number of people. This impact is less than significant.

4.2.1.4 Biological Resources

Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Special-Status Plant Species

Five sensitive plant species and/or their habitat could be affected by project construction: alkali milk-vetch, pappose tarplant, Contra Costa goldfields, streamside daisy, and saline clover. Impacts on the federally listed Contra Costa goldfields are discussed in Section 3.3.5, and impacts on other non-listed special status plant species are discussed in this section.

Alkali milk-vetch and streamside daisy plants are outside the temporary and permanent impact areas for both alternatives and the fundable first phases. However, the project would not be constructed in the area of occurrences of these species for many years and updated surveys will be needed to document the extent and number of the plants. It will be necessary to update surveys for the remaining species. Implementation of avoidance and minimization measures in Section 3.3.3.1, to conduct preconstruction surveys, would reduce this impact to a less-than-significant level.

Alternative B, Alternative C, and Alternative C, Phase 1 would result in direct and indirect impacts to pappose tarplant. Section 3.3.3.2 discusses these impacts in detail. Implementation of measures designed to protect sensitive natural communities and to protect water quality and prevent erosion and sedimentation in drainages and wetlands described in Section 3.3.2.1 would

protect pappose tarplant and wetland habitat from indirect impacts. Implementation of mitigation measures to conduct preconstruction surveys and to compensate for loss of special-status plants described in Section 3.3.3.1 would reduce this impact to a less-than-significant level.

Alternative B would result in temporary and permanent impacts to saline clover plants, and Alternative C would result in permanent impacts. The impacts are discussed in detail in Section 3.3.3.4. With implementation of measures designed to protect sensitive natural communities, to protect water quality, to prevent erosion and sedimentation in drainages and wetlands described in Section 3.3.2.1, to conduct preconstruction surveys, and to compensate for loss of special-status plants described in Section 3.3.3.1, impacts on saline clover would be less than significant.

Special-Status Animal Species

All proposed build alternatives would result in impacts on the following special-status animal species and/or their habitat: western pond turtle, white-tailed kite, western burrowing owl, northern harrier, loggerhead shrike, tricolored blackbird, nesting and migratory birds and raptors, nesting swallows, roosting bats, callippe silverspot butterfly, vernal pool fairy shrimp/vernal pool tadpole shrimp, valley elderberry longhorn beetle, Swainson's hawk, and California red-legged frog. Impacts on the state- and federally listed species are discussed in Section 3.3.5, and impacts on other non-listed special status animal species are discussed below.

Impacts on western pond turtles under all build alternatives may include the loss or disturbance of individuals during project construction. Section 3.3.4.1 discusses this impact in detail. Implementation of avoidance and minimization measures in Section 3.3.1.1, measures in Section 3.3.2.1 to protect water quality and prevent erosion and sedimentation in drainages and wetlands, and the measure to conduct preconstruction surveys for western pond turtles and stop work if the species is present in Section 3.3.4.1 would reduce this impact to a less-than-significant level.

All build alternatives may result in the disturbance of nesting white-tailed kites, loggerhead shrikes, tricolored blackbirds, and migratory birds and raptors during project construction. These impacts are discussed in detail in Sections 3.3.4.2, 3.3.4.5, 3.3.4.6, and 3.3.4.7. Implementation of avoidance and minimization measures in Section 3.3.1.1 and the measure to conduct preconstruction surveys for nesting birds and raptors and stop work if the species are present in Section 3.3.4.2 would ensure that this impact would be less than significant.

Impacts on western burrowing owls as a result of all the build alternatives may include the permanent loss and temporary disturbance of their habitat, as well as disturbance to individuals, if they are present during project construction. This impact is discussed in detail in Section 3.3.4.3. Implementation of avoidance and minimization measures in Section 3.3.1.1 and the measure to conduct preconstruction surveys for burrowing owls and stop work if the species is present and to compensate for loss of nesting habitat in Section 3.3.4.3 would ensure that this impact would be less than significant.

Impacts on nesting northern harriers are possible in the area north of SR 12W. Because there is no construction proposed for that area under Alternative B, Phase 1, there would be no impact under that alternative. This impact is discussed in detail in Section 3.3.4.4. This potentially significant impact under Alternative B, Alternative C, and Alternative C, Phase 1 would be reduced to a less-than-significant level with implementation of the avoidance and minimization

measure to conduct preconstruction surveys (including stopping work if the species is present) described in Section 3.3.4.4.

Bridge construction associated with all build alternatives could result in disturbance to nesting swallows. Impacts on swallows are discussed in detail in Section 3.3.4.8. This potentially significant impact would be reduced to a less-than-significant level with implementation of a measure to prevent swallows from nesting adjacent to new bridge construction, described in Section 3.3.4.8.

All build alternative have the potential to disturb roosting bats as discussed in Section 3.3.4.9. This effect would be reduced to a less-than-significant level with implementation of a measure to conduct preconstruction surveys for roosting bats, described in Section 3.3.4.9.

Special-Status Fish Species

Four special-status fish species occur in the project area: river lamprey, Sacramento splittail, fall/late fall–run Chinook salmon, and central California coast steelhead. Construction activities associated with all build alternatives could affect special-status fish species and their habitat. Additionally, water quality impacts may result from project operations. Impacts on special-status fish species and their habitat are summarized below and discussed in detail in Sections 3.3.4.10, 3.3.4.11, 3.3.4.12, and 3.3.5.7.

Impacts of construction activities on water quality could result from sediment and contaminants entering the stream. With implementation of measures to prevent discharge of contaminants into stream channels as discussed in Section 3.3.4.10, this would be a less-than-significant impact.

Direct impacts on fish habitat include removal of vegetation and shaded riverine aquatic (SRA) cover. With implementation of measures to protect riparian communities discussed in Section 3.3.1.1, this would be a less-than-significant impact.

Elements of the build alternatives could also change channel morphology and disrupt the migration corridor. However, because the channels would be restored to preproject conditions based on fish passage assessments for Suisun, Green Valley, and Ledgewood Creeks, no long-term changes to channel morphology are expected. Moreover, with implementation of measures to minimize impacts on creek channels as described in Section 3.3.4.10, this would be a less-than-significant impact

Under Alternatives B and C, a new single-span bridge would replace the existing bridge on Suisun Creek, and a new single-span bridge would be constructed downstream of the existing bridge. A potential spawning gravel bed was observed on Suisun Creek approximately 20 feet downstream of the existing bridge, which is proposed for removal and reconstruction. If the gravel cannot be avoided, it would be temporarily removed and replaced to preconstruction conditions, using, to the extent practicable, gravel removed from the site. With implementation of measures to avoid potential fish spawning habitat discussed in Section 3.3.4.11, this would be a less-than-significant impact.

Under Alternative B, a new bridge requiring piles driven into the channel would be constructed on Ledgeswood Creek. With implementation of measures to minimize noise impacts on special-status fish species discussed in Section 3.3.4.10, this would be a less-than-significant impact.

The increase in new impervious surfaces combined with runoff from petroleum products and other contaminants from automobiles could potentially result in an increase of contaminated runoff. With implementation of measures to prevent discharge of contaminants into stream channels as discussed in Section 3.3.4.10, this would be a less-than-significant impact.

Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Oak Woodland

Both alternatives and the fundable first phases would result in permanent loss of and temporary effects on oak woodlands. Additionally, indirect impacts on oak woodland vegetation outside the temporary impact zone might occur. These impacts are discussed in detail in Section 3.3.1.2. CDFG would recommend avoidance, minimization, and compensatory mitigation for the loss of native oak trees and oak woodland habitat. The loss or disturbance of oak woodland vegetation is considered significant because the habitat is declining and provides important wildlife habitat and other ecological functions and values. With implementation of measures to avoid and minimize disturbance and compensate for loss of riparian areas described in Section 3.3.1.1, this impact would be less than significant.

Would the project have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Jurisdictional Drainages and Wetlands

Effects on jurisdictional, i.e., federally protected, drainages and wetlands are discussed in Chapter 3, and a summary of significance under CEQA for these impacts is summarized as follows.

- Permanent and temporary impacts on jurisdictional perennial drainages would occur during project construction under all build alternatives. Section 3.3.2.1 discusses this impact in detail. These effects would be considered significant. However, implementation of avoidance and minimization measures in Section 3.3.1.1 and measures in Section 3.3.2.1 to protect water quality and prevent erosion and sedimentation in drainages and wetlands would reduce this impact to a less-than-significant level.
- Permanent and temporary impacts on jurisdictional seasonal drainages would occur during project construction under all build alternatives. Section 3.3.2.2 discusses this impact in detail. These effects would be considered significant. However, implementation of avoidance and minimization measures in Section 3.3.1.1 and measures in Section 3.3.2.1 to protect water quality and prevent erosion and sedimentation in drainages and wetlands would reduce this impact to a less-than-significant level.

- Permanent and temporary impacts on jurisdictional perennial marsh would occur during project construction under all build alternatives. Section 3.3.2.3 discusses this impact in detail. These effects would be significant. However, implementation of avoidance and minimization measures in Section 3.3.1.1, measures in Section 3.3.2.1 to protect water quality and prevent erosion and sedimentation in drainages and wetlands, and measures in Section 3.3.2.3 to restore temporarily disturbed perennial marsh and compensate for permanent loss of wetlands would reduce this impact to a less-than-significant level.
- Permanent and temporary impacts on jurisdictional alkali seasonal wetlands would occur during project construction under Alternative B, Alternative C, and Alternative C, Phase 1, but not Alternative B, Phase 1. Section 3.3.2.4 discusses this impact in detail. These effects would be considered significant. However, implementation of avoidance and minimization measures in Section 3.3.1.1, measures in Section 3.3.2.1 to protect water quality and prevent erosion and sedimentation in drainages and wetlands, and measures in Section 3.3.2.3 to compensate for permanent loss of wetlands would reduce this impact to a less-than-significant level.
- Permanent and temporary impacts on jurisdictional seasonal wetlands would occur during project construction under all build alternatives. Section 3.3.2.5 discusses this impact in detail. These effects would be significant. However, implementation of avoidance and minimization measures in Section 3.3.1.1, measures in Section 3.3.2.1 to protect water quality and prevent erosion and sedimentation in drainages and wetlands, and measures in Section 3.3.2.3 to compensate for permanent loss of wetlands would reduce this impact to a less-than-significant level.

Nonjurisdictional Wetlands and Water Features

Effects on nonjurisdictional wetland and waters are discussed in detail in Section 3.3.2.6. Effects on constructed seasonal drainages (or ditches) would occur under Alternative B, Alternative C, and Alternative C, Phase 1. Temporary and permanent impacts on nonjurisdictional perennial marsh would occur under Alternative B and Alternative B, Phase 1. Temporary and permanent impacts on nonjurisdictional seasonal wetlands would occur under Alternative C and Alternative C, Phase 1.

With implementation of measures to protect sensitive natural communities described in Section 3.3.1.1, and measures designed to protect, restore, and compensate for loss of wetland and drainage habitats described in Section 3.3.2, these impacts would be less than significant.

Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Construction activities associated with the build alternatives would require temporary redirection of the flow of water through the use of cofferdams and pipelines. These devices could block the migration of Chinook salmon and steelhead. However, construction activities would be avoided during the primary migration time of Chinook salmon and steelhead. Moreover, maintenance of fish passage through the construction site during stream dewatering activities would further reduce the potential for impacts on fish movement. The pipeline would be checked every few

hours (or more often depending on conditions) to clear any debris buildup that may occur during construction. Implementation of measures discussed in Section 3.3.4.10 would reduce this impact to a less-than-significant level.

A fish passage assessment was conducted on the current channel configurations in Green Valley, Ledge wood, and Suisun Creeks, the results of which were compared to post-project conditions. This assessment concluded that, under existing conditions, adult Chinook salmon and steelhead passage criteria related to minimum water depth are exceeded at the Green Valley Creek stream crossing due to excessive sediment in the constructed low-flow channel. Modification of the bridge structures at Green Valley Creek under all build alternatives would improve conditions for fish passage. The proposed modification of the Ledge wood Creek crossing along SR-12 under all build alternatives would create fish passage constraints associated with shallow water depths. With the implementation of the measures to improve the Ledge wood Creek channel downstream of the crossing discussed in Section 3.3.4.11, this impact would be less than significant.

Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Although the City of Fairfield has a tree ordinance that protects native oaks and several other native tree species, the ordinance does not apply to lands within the Caltrans right-of-way. No other local policies or ordinances pertain to the project. However, native trees do occur within the project area, although they are outside areas that have been mapped as sensitive community types, including riparian and oak woodlands. SCR 17 (1989) requires all state agencies to assess effects of their projects on oak woodlands that contain blue oak (*Quercus douglasii*), Engelmann oak (*Q. engelmannii*), valley oak (*Q. lobata*), or coast live oak (*Q. agrifolia*). Oak woodlands protected under this resolution must encompass at least five acres and contain five or more oak trees per acre. State agencies must preserve and protect oak woodlands to the extent feasible and mitigate loss with replacement plantings where the protected oak species are removed. Impacts on native oak trees that occur outside the mapped sensitive community types are addressed here for each project alternative.

Construction of Alternative B would remove native trees throughout the project area. Impacts on native trees that occur in riparian and oak woodlands are addressed under the impacts for those community types. Loss of 15 mature native oak trees located outside riparian or oak woodlands would occur due to construction in these areas:

- Red Top Road extension north of I-80 (Trees 100 and 105 in Volume 2, Figure 3.3-2a, Sheets 2–3).
- Widening of SR 12W (Trees 27–33 in Volume 2, Figure 3.3-2a, Sheet 4).
- The new I-80 EB on-ramp from NB I-680 (Trees 4–7 in Volume 2, Figure 3.3-2a, Sheets 16 and 17).
- Widening of I-80 between Dan Wilson Creek and the previous site of the I-80 eastbound Cordelia truck scales (Trees 34 and 35 in Volume 2, Figure 3.3-2a, Sheet 21).

Nine of the 15 affected trees (Trees 27–35)—seven coast live oaks, one interior live oak, and one valley oak—are mapped in upland scrub and ruderal habitats, but are adjacent to a more extensive area of live oak woodland, and protection under SCR 17 would apply. Implementation of measures to avoid and minimize disturbance and compensate for loss of riparian areas described in Section 3.3.1.1 would reduce this impact to a less-than-significant level.

Two other affected trees (Trees 101 and 105) are interior live oaks in an area mapped as upland scrub and surrounded by nonnative annual grassland and development. Constructed seasonal drainages cross this area of upland scrub, so the scrub essentially functions as riparian habitat adjacent to the drainages. Because these two trees are associated with drainages, their loss can be considered an impact on riparian habitat. Implementation of measures designed to compensate for loss of sensitive natural communities described in Section 3.3.1.1 would reduce this impact to a less-than-significant level.

The remaining three affected trees are two valley oaks and one coast live oak (Trees 4–7) in a developed area near buildings and are not associated with any protected habitat. These trees will be within the Caltrans right-of-way acquired for project construction, and no regulations protect them. Due to the low quality of the potential wildlife habitat and the lack of surrounding natural habitat, loss of these trees is not considered a significant impact. Impacts on migratory birds that could nest in these trees are addressed in Section 3.3.4.7.

Construction of Alternative B, Phase 1 would result in the loss of six mature native trees located outside riparian or oak woodlands (Trees 4–7 in Sheets 16 and 17; and Trees 34 and 35 in Volume 2, Figure 3.3-2b, Sheet 21). Mitigation for these trees is as described for Alternative B.

Construction of Alternative C would result in the loss of 13 mature native oak trees outside riparian or oak woodlands due to construction in the following areas:

- Red Top Road extension north of I-80 (Trees 100 and 105 in Volume 2, Figure 3.3-2c, Sheets 2 and 3).
- Widening of SR 12W (Trees 27–33 in Volume 2, Figure 3.3-2c, Sheet 4).
- The new I-680 SB on-ramp from EB I-80 along Jameson Canyon Creek (Trees 2 and 3 in Volume 2, Figure 3.3-2c, Sheets 9 and 14).
- Widening of I-80 between Dan Wilson Creek and the previous site of the I-80 eastbound Cordelia truck scales (Trees 34 and 35 in Volume 2, Figure 3.3-2c, Sheet 21).

Of these 13 trees, two coast live oaks (Trees 2 and 3) are within nonnative annual grassland adjacent to riparian habitat along Jameson Canyon Creek. Because these two trees are adjacent to riparian habitat, their loss can be considered an impact on riparian habitat. Implementation of measures to avoid and minimize disturbance and compensate for loss of riparian areas described in Section 3.3.1.1 would reduce this impact to a less-than-significant level. Avoidance and compensatory measures for the other 11 trees would be as described in Section 3.3.1.1.

Construction of Alternative C, Phase 1 would result in the loss of four mature native oak trees located outside riparian or oak woodlands (Trees 100 and 105 on Sheets 2 and 3, and Trees 2 and

3 in Figure 3.3-2d, Sheets 9 and 14). Mitigation for these trees is as described above for Alternatives B and C.

Native trees provide important habitat for wildlife and other ecological functions and values. The loss or disturbance of native trees, particularly oaks, is of concern to local and state agencies. With implementation of measures to avoid and minimize disturbance of riparian communities and compensate for losses as described in Section 3.3.1.1, this impact would be less than significant.

Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

Construction of Alternative B, Alternative C, or Alternative C, Phase 1 would involve installation of culverts and placement of fill for construction of the Red Top Road/I-680 interchange, resulting in direct disturbance of jurisdictional seasonal drainages in the Suisun Marsh Secondary Management Area (SMA). Construction in this area would also remove nonnative annual grassland in the SMA.

Alternative B, Phase 1 would have no impact on habitat in the SMA.

The Suisun Marsh Preservation Act established the SMA to serve as a buffer between the Suisun Marsh Primary Management Area and developed land. Solano County regulates uses in the SMA through Marsh Development Permits to ensure that proposed uses are consistent with the SMLPP.

Implementation of measures to protect sensitive natural communities; to protect water quality and restore wetland habitats; and to compensate for loss of Swainson's hawk foraging habitat as described in Sections 3.3.1.1, 3.3.2.1, and 3.3.5.6 would reduce this impact to a less-than-significant level.

Cumulative impacts associated with Alternative B, Alternative C, and Alternative C, Phase 1 on the SMA would result from construction of roads and rail lines within the water-related industrial reserve area at Collinsville and possible future expansion of SR 12 in Solano County, as identified in the Solano County General Plan (Solano County 2008). Construction of the project alternatives would add to the cumulative effects on the SMA. However, with implementation of the avoidance and minimization efforts and compensation for remaining impacts, the contribution of build alternatives would not be cumulatively considerable. Further discussion of this issue is presented in Section 4.2.1.9.

4.2.1.5 Cultural Resources

Would the project cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?

There are three historical resources located that may be affected by the build alternatives: the Suisun City Train Depot (parcel 0032-020-240), the Village of Cordelia Historic District, and the

Suisun City Historic District. The Suisun City Train Depot Village and the Cordelia Historic District are listed in the NRHP, and the Suisun City Historic District is eligible for listing in the NRHP and the CRHR. All three properties are historical resources for the purposes of CEQA.

Under Alternative B, construction would occur in the southern portion of parcel 0032-020-240 (Suisun City Train Depot), in the vicinity of the Village of Cordelia Historic District, and near and within the boundary of the recommended Suisun City Historic District. Alternative B would not lead to the physical demolition, destruction, relocation, or alteration of the historical resources or their immediate surroundings, and character-defining features of each resource would remain intact. Moreover, proposed construction would not affect the overall setting of the resources because it would be located away from and outside the district (Suisun City Historic District) or because the setting has already been compromised by modern construction. Accordingly, this alternative would result in a less-than-significant impact.

Alternative B, Phase 1 would result in construction in the vicinity of the Village of Cordelia Historic District only. The impact to the district would be less than significant because construction would not occur on a parcel that contained a contributing resource.

Alternative C would include construction in the vicinity of the Suisun City Train Depot and the Suisun City Historic District. Like Alternative B, impacts to these resources would be less than significant.

Please refer to Section 3.1.8 for additional discussion on potential effects on cultural resources.

Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?

Two known archaeological resources that could not be found have been reported within or adjacent to the project APE. CA-Sol-262 is located within the project footprint for Alternative C and Alternative C, Phase 1. CA-Sol-242 has two mapped locations, which are entirely or partially within the footprint for Alternative B and Alternative B, Phase 1. It is possible that these sites may be rediscovered during project construction and that they may be eligible for listing in the NRHP or the CRHR. Additionally, there is the possibility that buried archaeological resources that would be eligible for listing in the NRHP or the CRHR are located within the footprint of any of the build alternatives. Project construction could result in the disturbance or destruction of these resources, which would be considered a significant impact. However, implementation of the Department's standard procedures for unanticipated discovery and the implementation of measures to conduct further research and enter into a Programmatic Agreement (PA) (discussed in Section 3.1.8) would reduce these impacts to a less-than-significant level under CEQA. The execution of the project PA will also signify completed compliance with Section 106 of the NHPA.

Would the project disturb any human remains, including those interred outside of formal cemeteries?

No known human remains are located within the project area. However, there is the possibility that construction of any of the build alternatives may result in the disturbance of human remains.

This would be considered a significant impact. However, implementation of the Department's standard procedures and compliance with PRC 5097.98 and Section 7050.5[c] of the California Health and Safety Code to protect human remains in case of accidental discovery during construction (discussed in Section 3.1.8) would reduce this impact to a less-than-significant level.

4.2.1.6 Paleontology

Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Construction of Alternative B could cause damage to paleontological resources. Several units are sensitive for paleontological resources and fossils could be present in the project area. Figure 3.2.4-2, Figure 3.2.4-3a, and Figure 3.2.4-3b show the locations of the following sensitive units.

- Relatively shallow Pleistocene sediments that could be sensitive underlying Holocene alluvial fan deposits (Qhf), which range in depth from approximately 0 to 25 feet, in the central and eastern portions of the project area—the likelihood of encountering sensitive deposits increases with depth and with proximity to surficial exposures of sensitive deposits.
- Late Pleistocene alluvial fan (Qpf) deposits that are highly sensitive in the western portion of the project area—although there are no known fossils records from this deposit within Solano County, diverse vertebrate faunas have been collected from similar Pleistocene alluvial units in other parts of northern California. These deposits are sensitive for paleontological resources because they tend to contain vertebrate fossils.
- Outcrops of Sonoma volcanics (Tsvt and Tsva) that are highly sensitive in the western portion of the project area, west of Suisun Creek, and in the vicinity of the I-80/SR 12W interchange—of the 69 records of vertebrate fossils in Solano County (University of California Museum of Paleontology 2007a), 29 of them are from the Sonoma volcanics unit, including horse, deer, and unidentified mammals (Table 3.2.4-2).

If fossils are present in the project area, they could be damaged during project construction. Substantial damage to or destruction of significant paleontological resources as defined by the SVP (Society of Vertebrate Paleontology Conformable Impact Mitigation Guidelines Committee 1995) would represent an impact.

The level of impact under Alternative C, would be the same as under Alternative B but to a greater extent (Figure 3.2.4-2, Figure 3.2.4-4a, and Figure 3.2.4-4b). Table 3.2.4-3 compares the impacts of major excavation areas for Alternatives B and C on paleontological resources based on depth and extent of excavation and the paleontological sensitivity of the unit. Only project components that differ between alternatives are included. It should be noted, however, that both alternatives involve extensive, deep grading associated with the Red Top Road expansion in the paleontologically sensitive Markley Sandstone (Eocene), Sonoma Volcanics (Pliocene and late Miocene), and alluvial fan deposits (Late Pleistocene).

The level of impact under the fundable first phase of either alternative would be the same as under full build alternative, but to a lesser extent.

For all build alternatives, implementation of avoidance, minimization, and/or mitigation measures identified in Section 3.2.4, “Paleontology,” would reduce these impacts to a less-than-significant level.

4.2.1.7 Geology and Soils

Would the project expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?

As discussed in Section 3.2.3, the risk of surface fault rupture in the project area is generally high because of its proximity to active faults. There is the potential for impacts related to fault rupture, particularly under Alternative C and Alternative C, Phase 1, as structures under these alternatives are located in the vicinity of the Green Valley fault. These impacts could be significant. However, compliance with the UBC Seismic Hazard Zone 4/CBSC, Department, and County General Plan standards in addition to implementation of avoidance, minimization, and/or mitigation measures described in Section 3.2.3 would reduce this impact to a less-than-significant level.

Would the project expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking?

As discussed in detail in Section 3.2.3, the possibility of the project area experiencing strong ground shaking may be considered moderate to high because of its proximity to active faults. There is the potential for all build alternatives to result in significant impacts involving ground shaking. However, compliance with the UBC Seismic Hazard Zone 4/CBSC, Department, and County General Plan standards, in addition to implementation of the recommendations from the Draft Geotechnical report noted in the avoidance, minimization, and/or mitigation measures in Section 3.2.3, would reduce this impact to a less-than-significant level.

Would the project expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction?

The liquefaction potential in the project area corridor is considered moderate, with the exception of areas along the eastern portion of Jameson Canyon Creek, Suisun Creek, Green Valley Creek, Ledgewood Creek, and in the eastern segment of the project area, where it is considered high. This impact is discussed in detail in Section 3.2.3.

Impacts of the proposed build alternatives related to potential structural damage and injury from development on materials prone to ground failure, including materials subject to liquefaction, would be reduced to a less-than-significant level with the implementation of avoidance, minimization, and/or mitigation measures described in Section 3.2.3.

Would the project expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving landslides?

As discussed in Section 3.2.2, there are landslide deposits, elevated landslide potential, and some debris-flow potential in the southwestern portion of the project area. Impacts of the build alternatives related to potential structural damage and injury from landslides or other slope failures would be reduced to a less-than-significant level with implementation of avoidance, minimization, and/or mitigation measures described in Section 3.2.3.

Would the project result in substantial soil erosion or the loss of topsoil?

Construction activities associated with the build alternatives could result in soil compaction and wind erosion effects that could adversely affect soils and reduce the revegetation potential at the construction sites and staging areas. See Section 3.2.3 for a detailed discussion of this potentially significant impact. The development and implementation of a SWPPP (see avoidance, minimization, and/or mitigation measures in Section 3.2.2) and compliance with the County's Grading Ordinance would reduce this impact to a less-than-significant level.

Most of the project area has already been disturbed by previous road-building activities, agricultural operations, and other development. Future ground-disturbing activities such as grading, excavation, removal of vegetation cover, and loading are not expected to result in any significant removal or significant loss of topsoil in the project area.

Would the project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

As discussed in Section 3.2.3, in general, short-term and long-term consolidation settlements do not appear to be a reason for concern in the project area, except near Suisun Valley Road and Dan Wilson Creek, where soft clays are indicated in test borings. Consolidation settlements may pose a significant hazard to structures in the immediate area of these soils. This potentially significant impact would be reduced to a less-than-significant level with implementation of avoidance, minimization, and/or mitigation measures in Section 3.2.3.

Would the project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

As discussed in Section 3.2.3, soils in the project area have been identified as having moderate to high shrink-swell potential. This could result in a significant impact. However, compliance with the UBC Seismic Hazard Zone 4/CBSC, Department, and County General Plan standards, in addition to avoidance, minimization, and/or mitigation measures to implement recommendations from the Draft Geotechnical Report as described in Section 3.2.3 would reduce this impact to a less-than-significant level.

4.2.1.8 Hazards and Hazardous Materials

Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

All potential hazardous waste (e.g., naturally occurring asbestos, contaminated groundwater, aerially deposited lead) generated during project construction would be transported and disposed of in accordance with existing state and federal laws pertaining to the handling and disposal of hazardous materials; accordingly, this would be a less-than-significant impact.

Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Activities related to construction of the project alternatives could release hazardous materials into the environment. During the construction phase of the project alternatives, ground disturbance could release aerially deposited lead in surface soils adjacent to the edge of the existing pavement, as well as lead and other potentially toxic substances found in the yellow traffic striping and/or pavement markings. These hazardous materials, as well as contaminated groundwater from dewatering activities, would be transported for proper disposal. In the event of an accident, the materials could be released into the environment. Without proper precautions, exposure to these hazardous materials could become human health hazards. Implementation of the avoidance and minimization measures discussed in Section 3.2.5, including compliance with existing state and federal laws pertaining to the handling and disposal of hazardous materials, would reduce these impacts to a less-than-significant level.

Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Three schools are located within 0.25 mile of the project area: Solano Community College at 4000 Suisun Valley Road, Rodriguez High School at 5000 Red Top Road, and Green Valley Middle School at 3630 Ritchie Road, all in Fairfield. Although construction activities would be roadway related, there is the potential for a hazardous spill or accident during construction. Implementation of the avoidance and minimization measures discussed in Section 3.2.5, including compliance with existing state and federal laws pertaining to the handling and disposal of hazardous materials, would reduce these impacts to a less-than-significant level.

Would the project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

According to the ISA completed in April 2009, there are 49 known or suspected areas of contamination within or adjacent to the project footprint. Disturbance of these areas could result in exposure to environmental contamination that could adversely affect humans and the environment. For areas proposed for acquisition, the Department would prepare, during the design phase, site-specific Phase I environmental site assessments in accordance with the requirements of the All Appropriate Inquiries Final Rule promulgated as an amendment to Community Environmental Response, Compensation, and Liability Act. A Phase I environmental site assessment will provide information to determine if there is a reasonable expectation that the site is contaminated. If the Phase I environmental site assessment reveals that it is reasonable to expect that some contamination would be encountered, the potentially affected sites would be further investigated and sampled, the constituents of concern identified,

and potential impacts delineated in a Phase II environmental site assessment. The Department would make every effort to have the property owner or responsible party investigate and clean up the contamination prior to acquisition. For those sites not proposed for acquisition where environmental contamination may occur as determined by the ISA, the construction contracts for the project alternatives would require the development and implementation of plans to safeguard human health and the environment. These plans are stipulated in existing hazardous materials regulations and include a waste management and disposal plan, a health and safety plan, and a SWPPP. Given the existence of plans and regulations to avoid or reduce hazardous materials exposure and health risks, the impact of hazardous materials exposures is considered to be less than significant.

Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Potential short-term impacts on emergency service providers due to by congestion during project construction and temporary lane closures may result from construction-related activities under all build alternatives. The Department would coordinate with emergency service providers (e.g., police, fire, hospital) in developing a traffic management plan to ensure that no disruptions occur to vital emergency services during project construction. Implementation of the traffic management plan would reduce potentially significant impacts to a less-than-significant level. On completion, the build alternatives would not impair but would rather improve the efficiency of emergency response by alleviating congestion through the I-80/I-680/SR 12 interchange complex, enabling greater maneuverability for emergency vehicle route, and improving safety conditions. Consequently, potential impacts on emergency response plans would be beneficial. Section 3.1.6 presents more information on this topic.

Would the project expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

Wildland fires are a seasonal hazard in northern California, accounting for more than half the fires in unincorporated areas. According to the California Department of Forestry and Fire Protection (CAL FIRE) Solano County Natural Hazard Disclosure (Fire) map (California Department of Forestry and Fire Protection 2000); the majority of the project area is not located in a fire hazard region. However, the western segment of SR 12 to its junction with I-80 is in an area identified as a “wildland area that may contain substantial forest fire risks and hazards.”

The primary risks of potential fire hazards associated with the build alternatives involve the use of vehicles and equipment during construction. Heat or sparks emitted from equipment in the area could ignite dry vegetation and cause a fire. Construction crews would use existing roads along most of the alignment corridor. In addition, the Department follows a standard practice of developing and implementing a fire risk management plan that addresses fire-suppression equipment and procedures to be used during construction and training of construction and maintenance crews. Implementation of the avoidance and minimization measures discussed in Section 3.2.5 would ensure that any potentially significant impacts would be reduced to a less-than-significant level.

4.2.1.9 Hydrology and Water Quality

Would the project violate any water quality standards or waste discharge requirements?

The build alternatives would result in up to 470 acres of soil disturbance. Disturbed soil could cause potential erosion and sediment control impacts during construction. Construction of the project alternatives would involve the use of construction equipment and associated fuels, solvents, lubricants, and other pollutants. These substances may be released into the environment during construction and could result in adverse effects on water quality. In addition, operation of the project alternatives could affect water quality as a result of stormwater carrying potential pollutants from the roadway surfaces and shoulders. Implementation of measures specified in Section 3.2.2 would reduce this potential impact to a less-than-significant level.

Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?

The build alternatives entail major reconstruction over multiple waterways. Specifically, the drainage pattern of Raines Drain could be affected by placement of fill material in the floodplain. Avoidance, minimization, and/or mitigation measures described in Section 3.2.1 specify construction of an upstream inlet and stable cavities that would allow flows to pass despite the reduction in size of the floodplain. In addition, implementation of measures described in Section 3.2.2 (i.e., preparation and implementation of a SWPPP) would protect water quality from erosion and siltation impacts. The SWPPP would also address operations-related water quality impact through permanent treatment BMPs. This impact would be less than significant.

Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

The build alternatives entail major reconstruction over multiple waterways. Specifically, the drainage pattern of Raines Drain could be affected by placement of fill material in the floodplain. In addition, the build alternatives would increase the amount of impervious surface. However, BMPs identified in the Storm Water Data Report would be sized adequately to drain to appropriate locations. In addition, implementation of measures specified in Section 3.2.2 would ensure that flooding on or off the site would not result from project implementation. This impact would be less than significant.

Would the project create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

The build alternatives would all increase the amount of impervious surface, although to varying degrees. However, BMPs identified in the Storm Water Data Report would be sized adequately to drain to appropriate locations. In addition, each build alternative has the potential to increase discharges of polluted runoff to local waterways. However, implementation of operational BMPs

identified and other measures specified in Sections 3.2.1 and 3.2.2 ensure that this would be a less-than-significant impact.

Would the project otherwise substantially degrade water quality?

In accordance with the Department's NPDES permit and the Construction General Permit, BMPs incorporated into the project alternatives would reduce the discharge of pollutants during construction, as well as permanently to the maximum extent practicable. These BMPs fall into three categories: temporary construction site BMPs, design pollution prevention BMPs, and permanent treatment BMPs. Moreover, measures specified in Section 3.2.2 (i.e., implementation of BMPs and a SWPPP) would ensure that this impact remain less than significant.

Would the project place within a 100-year flood hazard area structures which would impede or redirect flood flows?

None of the build alternatives would place any housing or structure within the 100-year flood hazard area. However, the fill that will be used for the truck scales has the potential to redirect flows. Construction of an upstream inlet structure and stable cavities as described in Section 3.2.1 would ensure that this is a less-than-significant impact.

The proposed inlet structure and storage mitigation (through additional basins or below ground storage) at Raines Drain crossing of I-80 will mitigate for the increase in pavement elevation and the loss of storage in the floodplain. These facilities would be designed to allow flooding up to the existing overtopping elevation of I-80 and prevent an increase in flood elevation upstream of I-80 and would minimize impacts to downstream areas.

4.2.1.10 Land Use and Planning

Would the project physically divide an established community?

The established communities in the project area—Cordelia and the Cities of Fairfield and Suisun City—are currently divided by the existing I-80, I-680, and SR 12 facilities. The build alternatives would result in widening the footprint of the existing facilities, but because the existing facilities already divide the community, the build alternatives would have a less-than-significant impact.

Would the project conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

The Department is the agency with jurisdiction over project land use by virtue of its authority to build the project alternatives. As a state agency, the Department (and properties under its control) is not subject to local land use plans and regulations of local jurisdictions. Consequently, with one exception, local land use plans and regulations are not applicable to the build alternatives.

As discussed in Section 3.1.1.1, the Suisun Marsh Protection Act delegates to Solano County the responsibility for establishing policies, regulations, programs, and operating procedures that conform to the provisions of the Act and its accompanying Suisun Marsh Protection Plan. The Department is subject to these requirements. Solano County's Suisun Marsh Policy Addendum recognizes the need to expand SR 12, and the County's Zoning Ordinance establishes the marsh development permit process by which an expansion would be considered and approved.

Alternative B, Alternative C, and Alternative C, Phase 1 would potentially encroach into the secondary zone of the Suisun Marsh, particularly along I-680. However, the Department would apply to Solano County for a marsh development permit, pursuant to County ordinance. Approval of the permit will be consistent with the Solano County General Plan's Suisun Marsh policies and policy addendum, as determined by the County. No construction would occur prior to issuance of a permit. Permit approval would include the key performance standards listed below.

- Public roadway construction and improvement will be subject to restrictions permitting the natural water movement necessary to sustain the marsh environment.
- All designated scenic roadways should be subject to a combination of specific policies based on the composition of each visual unit along the route. The combination of policies associated with the foreground and distant components of each visual unit (and with any special features) as noted on the plan diagram apply to all development that falls within view of the designated scenic roadway.
- Development shall minimize any impacts of earth disturbance, erosion, and water pollution.
- Riparian vegetation along significant County waterways shall be preserved in order to maintain water quality and wildlife habitat values.
- Development shall preserve and enhance wherever possible the diversity of wildlife and aquatic habitats found in the Suisun Marsh and surrounding upland areas to maintain these unique wildlife resources.
- Development shall protect marsh waterways, managed and natural wetlands, tidal marshes, seasonal marshes and lowland grasslands which are critical habitats for marsh-related wildlife.

In view of these conditions, this impact would be less than significant.

4.2.1.11 Noise

Would the project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Traffic Noise

Traffic noise levels are predicted to exceed Department noise standards under all build alternatives at residential and recreational outdoor use areas (NAC for Activity Category B land use under the Protocol). However, because the project alternatives are not predicted to result in a

substantial increase in noise (i.e., 12 dB over existing noise levels), this impact is considered to be less than significant.

Construction Noise

Construction would be conducted in accordance with the Department's Standard Specifications Section 14-8 and applicable local noise standards. Construction noise would be short-term, intermittent, and masked by local traffic noise. In addition, Department's Standard Specification 14-8.03, following measures may be implemented to further reduce noise effects from construction.

- Use of equipment with sound-control devices that are no less effective than those provided on the original equipment.
- Prohibition of the use of any equipment with an unmuffled exhaust.
- Changing the location of stationary construction equipment to maximize the distance to noise-sensitive uses.
- Turning off idling equipment.
- Rescheduling construction activity to non-sensitive hours of the day.
- Notifying adjacent residents in advance of construction work.
- Installing acoustic barriers around stationary construction noise sources.

This impact is expected to be less than significant. No mitigation is required.

Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Construction activities associated with the operation of heavy equipment may generate localized groundborne vibration and noise. However, vibration from non-impact construction activity is typically below the threshold of perception when the activity is more than about 50 feet from the receiver. Moreover, vibration from such activities is a short-term effect that ends when construction is completed. This impact is expected to be less than significant. No mitigation is required.

Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Traffic noise levels are expected to increase by a maximum of 8 dB under design-year with-project conditions under all alternatives, compared to existing conditions. This increase is not considered substantial under the Protocol, which defines a substantial increase as a 12 dB increase over existing traffic noise levels. Based on this, traffic noise under design year with-project conditions is not expected to result in a substantial permanent increase in noise. This impact is considered to be less than significant. No mitigation is required.

Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Construction activities would result in a temporary increase in noise. However, as discussed above, construction activities would be conducted in accordance with the Department's Standard Specifications Section 14-8 and applicable local noise standards. Consequently, this impact is considered less than significant. No mitigation is required.

4.2.1.12 Population and Housing

Would the project induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

Because the project alternatives would only improve existing highway facilities, it would accommodate growth but would not be growth inducing. Accordingly, this is a less-than-significant impact.

Would the project displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

Alternatives B and C would result in a single residential displacement associated with the relocation of the westbound truck scales. Because comparable replacement housing would be made available to the residents of the single property to be displaced, and because construction of replacement housing would not be necessary to accommodate a single displacement, this would be a less-than-significant impact.

Would the project displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

Alternatives B and C would result in a single residential displacement associated with the relocation of the westbound truck scales. Because comparable replacement housing would be made available to the residents of the single property to be displaced, and because construction of replacement housing would not be necessary to accommodate a single displacement, this would be a less-than-significant impact.

4.2.1.13 Public Services

Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for fire protection or police protection?

Potential short-term impacts on police, fire, and emergency service providers may result from construction-related activities under all build alternatives. Potential impacts may include increased emergency response times within the project area caused by congestion during project construction and temporary lane closures. Lane closures are expected to be of short-term and occur in off-peak hours. The effect is expected to be minimal. In addition, as part of its standard procedure, the Department will prepare a Transportation Management Plan (TMP). Before

initiating construction, this TMP will be provided to all emergency service providers in the area. The TMP will serve to notify all emergency service providers in the project area of the project construction schedule and the time and location of lane closures. The TMP will identify anticipated dates and hours of construction, as well as any anticipated limits on access. Notice will be provided at least one week before construction begins. To the extent possible, emergency vehicles will be allowed through roadway segments temporarily closed for construction purposes. Accordingly, this will be a less-than-significant impact.

Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for schools?

A small portion of Rodriguez High School would be affected under Alternative C and Alternative C, Phase 1. The realignment of Lopes Road under these alternatives would affect a small landscaped area beyond the outfield fence of the school's softball field. However, because this area is small and located outside a fence, its loss would not affect the function of the school. This would be a less-than-significant impact.

Under Alternatives B and C, a portion of the Fairfield Linear Park east of Abernathy Road would be affected. As part of the project, the facility would be relocated prior to construction onto agricultural land that is currently under a Williamson Act contract. This impact is addressed in greater detail in Section 4.2.3.1. The portion of the alternatives that would encroach upon Williamson Act land is a relatively small subset of the overall project effects, and would constitute a less-than-significant impact.

4.2.1.14 Recreation

Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

Under Alternatives B and C, a portion of the Fairfield Linear Park east of Abernathy Road would be affected.. As part of the project, the facility would be relocated prior to construction onto agricultural land. This would be a less-than-significant impact.

4.2.1.15 Traffic and Transportation/Pedestrian and Bicycle Facilities

Would the project exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?

Alternatives B and C would clear all mainline sections of deficiencies experienced in the No-Project condition in 2035 in the AM peak period. Some deficiencies would remain in the PM peak period, although these deficiencies are due to the downstream bottleneck at Air Base Parkway, outside the project limits. This impact would be less than significant.

4.2.1.16 Utilities and Service Systems

Would the project require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

As discussed in Section 3.2.2, the build alternatives would increase the amount of stormwater runoff within the state right-of-way. To manage the stormwater runoff, the on-site drainage facilities would be reconfigured within the proposed right-of-way as part of the project design. The associated watersheds would be only minimally affected. Because facilities would be reconfigured in the same general area as existing facilities, there would be no entirely new facilities outside the project footprint. Preparing and implementing a SWPPP and implementing BMPs would reduce this impact to a less-than-significant level.

4.2.2 Significant Environmental Effects of the Proposed Project

4.2.2.1 Agriculture Resources

Would the project involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland to non-agricultural use?

Despite permanent protections, Solano County has had a steady erosion of its agricultural base, particularly along the I-80 corridor. Substantial amounts of prime agricultural land continue to be taken out of production every year. For example, according to statistics compiled by the Department of Conservation's Farmland Mapping and Monitoring Program, during the period between 2004 and 2008, 5,840 acres of prime farmland were taken out of production county-wide. While most of this loss consisted of conversion to grazing land, relegating prime soils to grazing rather than the production of crops is an indicator of an adverse change in the agricultural economy.

The build alternatives would result in the direct conversion of agricultural land within their boundaries, through the widening of access-controlled freeway segments. Although the federal LESA analysis indicates that this is a less-than-significant impact, there are other considerations that lead to a different conclusion for purposes of CEQA. The project alternatives will result in the conversion of a substantial portion of the Valine Conservation Easement. The purpose of that easement is the permanent protection of farmland within the Suisun Valley, consistent with the Solano County General Plan's emphasis on preserving the Suisun Valley Strategic Plan area for continued agricultural use. As such, it is a foundation of the County's efforts to halt conversion of agricultural lands in the area. Loss of most of the remaining easement south of the route of the North Connector conflicts with this objective. Further, the proposed project would result in the direct conversion of from 122 (Alternative C) to 140 (Alternative B) acres of existing farmland to non-agricultural use. This further erodes the agricultural base within the Suisun Valley Strategic Plan area and conflicts with the County's efforts to preserve the area for continued agricultural use.

This change in the environment would not likely result in the conversion of farmland outside the project boundaries, because it would not change the existing access to this thoroughfare from agricultural lands or otherwise encourage conversions.

This individual impact will be reduced below the level of significance by implementation of the mitigation measure to compensate for the conversion of important farmland.

Would the project contribute to the cumulative conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

The project alternatives would contribute to the steady loss of agricultural land within Solano County. While the project alternatives' contribution to this impact is relatively small in the context of Solano County that does not mean that it is not considerable in the context of agricultural land preservation in the Suisun Valley. The project alternatives are located in a visible portion of the county where conversions have already occurred and which Solano County has identified as one of ten areas to be strategically planned in order to preserve their agricultural character. The conversion of from 122 to 140 acres of farmland within the Suisun Valley Strategic Plan area will reduce the amount of land available to maintain the stable agricultural economy necessary to support continued agricultural use.

Agricultural land is a finite resource. However, the project mitigation will require the conservation of an equal amount of agricultural land and acquisition of a larger conservation easement; this mitigation would replace the land that is lost. For CEQA purposes, therefore, the proposed project's contribution to cumulative impacts on farmland is less than considerable.

4.2.3 Unavoidable Significant Effects of the Proposed Project

4.2.3.1 Traffic and Transportation/Pedestrian and Bicycle Facilities

Would the project exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?

Under the fundable first phases of the alternatives, certain segments would operate below STA's standard of LOS E, because the fundable first phase would not provide the full project's traffic carrying capacity. Under Alternative B, Phase 1 in 2015, the westbound SR 12E on-ramp from Jackson Street would continue to operate unacceptably during the a.m. peak hour, but this is due to the queue backup from the SR 12E/Pennsylvania Avenue intersection. During the p.m. peak hour, eastbound SR 12E between the truck scales and Beck Avenue would continue to operate unacceptably.

Under Alternative C, Phase 1 in 2015, westbound SR 12E from east of Main Street to Pennsylvania Avenue would continue to operate unacceptably during the a.m. peak hour, due to the spillback from the SR 12E/Pennsylvania Avenue intersection. During the p.m. peak hour, in the eastbound direction, queue spillback from the Beck Avenue and Pennsylvania Avenue

intersections on SR 12E would still extend back to I-680, but the extent of queue would be less than under no-project conditions.

These impacts are considered significant and no mitigation to reduce them to a less-than-significant level is available, therefore these impacts to traffic under the fundable first phases of the alternatives are significant and unavoidable.

4.2.4 Significant Irreversible Environmental Changes

There would be no significant irreversible environmental changes other than those typically associated with a roadway improvement project. For a detailed discussion of irreversible and irretrievable commitments of resources, refer to Section 3.5.

4.2.5 Growth-Inducing Impacts

Both build alternatives, in varying degrees, would add capacity to the I-80/I-680/SR 12 interchange complex to accommodate existing and future projected increases in traffic. By doing so, the project alternatives would, to some extent, accommodate growth both locally and regionally. This growth in traffic is the result of local and regional land use plans, which, in turn, have been considered in regional transportation plans. Locally, the proposed project could indirectly lead to the development and intensification of land uses in the study area by improving access and roadway capacity. However, this development and intensification would most likely occur in areas already planned for such development by the County, the City of Fairfield, and Suisun City. Accordingly, growth-inducing impacts would be less than significant.

4.2.6 Climate Change

Regulatory Setting

While climate change has been a concern since at least 1988, as evidenced by the establishment of the United Nations and World Meteorological Organization's Intergovernmental Panel on Climate Change (IPCC), the efforts devoted to greenhouse gas (GHG) emissions reduction and climate change research and policy have increased dramatically in recent years. These efforts are primarily concerned with the emissions of GHG related to human activity that include carbon dioxide (CO₂), methane, nitrous oxide, tetrafluoromethane, hexafluoroethane, sulfur hexafluoride, HFC-23 (fluoroform), HFC-134a (1, 1, 1, 2 –tetrafluoroethane), and HFC-152a (difluoroethane).

In 2002, with the passage of Assembly Bill 1493 (AB 1493), California launched an innovative and pro-active approach to dealing with GHG emissions and climate change at the state level. Assembly Bill 1493 requires the California Air Resources Board (CARB) to develop and implement regulations to reduce automobile and light truck GHG emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the 2009-model year. However, in order to enact the standards California needed a waiver from the U.S. Environmental Protection Agency (EPA). The waiver was denied by EPA in December

2007. See *California v. Environmental Protection Agency*, 9th Cir. Jul. 25, 2008, No. 08-70011. On January 26, 2009, it was announced that EPA will reconsider their decision regarding the denial of California's waiver. On May 18, 2009, President Obama announced the enactment of a 35.5-mpg fuel economy standard for automobiles and light duty trucks which will take effect in 2012. On June 30, 2009 EPA granted California the waiver. California is expected to enforce its standards for 2009 to 2011 and then look to the federal government to implement equivalent standards for 2012 to 2016. The granting of the waiver will also allow California to implement even stronger standards in the future. The state is expected to start developing new standards for the post-2016 model years later this year.

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05. The goal of this Executive Order is to reduce California's GHG emissions to: 1) 2000 levels by 2010, 2) 1990 levels by the 2020 and 3) 80% below the 1990 levels by the year 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006. AB 32 sets the same overall GHG emissions reduction goals while further mandating that CARB create a plan, which includes market mechanisms, and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." Executive Order S-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the state's Climate Action Team.

With Executive Order S-01-07, Governor Schwarzenegger set forth the low carbon fuel standard for California. Under this executive order, the carbon intensity of California's transportation fuels is to be reduced by at least 10% by 2020.

Climate change and GHG reduction is also a concern at the federal level. However, at this time no legislation or regulations have been enacted specifically addressing GHG emissions reductions and climate change. California, in conjunction with several environmental organizations and several other states, sued to force the EPA to regulate GHG as a pollutant under the Clean Air Act (*Massachusetts vs. Environmental Protection Agency et al.*, 549 U.S. 497 [2007]). The court ruled that GHG does fit within the Clean Air Act's definition of a pollutant, and that the EPA does have the authority to regulate GHG. Despite the Supreme Court ruling, there are no promulgated federal regulations to date limiting GHG emissions.

On December 7, 2009, the EPA Administrator signed two distinct findings regarding greenhouse gases under section 202(a) of the Clean Air Act:

- **Endangerment Finding:** The Administrator finds that the current and projected concentrations of the six key well-mixed greenhouse gases--carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆)--in the atmosphere threaten the public health and welfare of current and future generations.
- **Cause or Contribute Finding:** The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.

These findings do not themselves impose any requirements on industry or other entities. However, this action was a prerequisite to finalizing EPA's proposed greenhouse gas emission

standards for light-duty vehicles, which were jointly proposed by EPA and the Department of Transportation's National Highway Safety Administration on September 15, 2009.¹ On May 7, 2010 the final Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards was published in the Federal Register.²

The final combined EPA and National Highway Traffic Safety Administration (NHTSA) standards that make up the first phase of this national program apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. The standards require that these vehicles meet an estimated combined average emissions level of 250 grams of carbon dioxide per mile, equivalent to 35.5 mpg if the automobile industry were to meet this carbon dioxide level solely through fuel economy improvements. Together, these standards will cut greenhouse gas emissions by an estimated 960 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012–2016).

According to Recommendations by the Association of Environmental Professionals on How to Analyze GHG Emissions and Global Climate change in CEQA Documents (March 5, 2007), an individual project does not generate enough GHG emissions to significantly influence global climate change. Rather, global climate change is a cumulative impact. This means that a project may participate in a potential impact through its incremental contribution combined with the contributions of all other sources of GHG. In assessing cumulative impacts, it must be determined if a project's incremental effect is "cumulatively considerable." See CEQA Guidelines sections 15064(i)(1) and 15130. To make this determination the incremental impacts of the project must be compared with the effects of past, current, and probable future projects. To gather sufficient information on a global scale of all past, current, and future projects in order to make this determination is a difficult if not impossible task.

As part of its supporting documentation for the Draft Scoping Plan, CARB recently released an updated version of the GHG inventory for California (June 26, 2008). Figure 4-1 below is a graph from that update that shows the total GHG emissions for California for 1990, 2002–2004 average, and 2020 projected if no action is taken.

¹ <http://www.epa.gov/climatechange/ endangerment.html>.

² <http://www.regulations.gov/search/Regs/contentStreamer?objectId=0900006480a5e7f1&disposition=attachment&contenttype=pdf>.

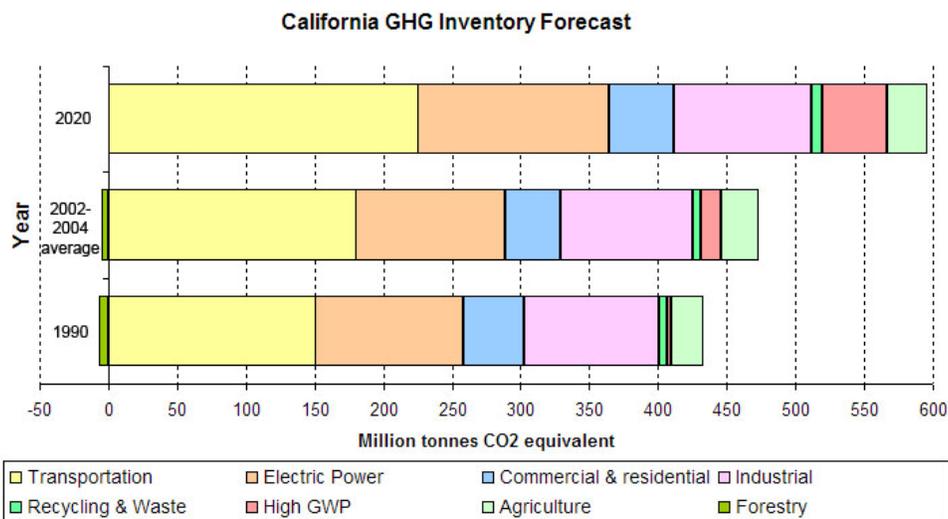
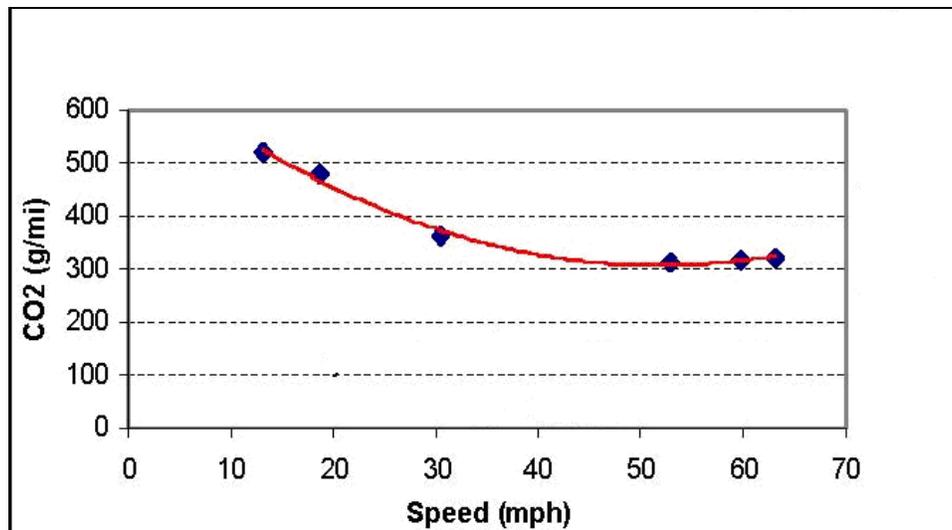


Figure 4-1. California Greenhouse Gas Inventory
 Taken from: <http://www.arb.ca.gov/cc/inventory/data/forecast.htm>

Caltrans and its parent agency, the Business, Transportation, and Housing Agency, have taken an active role in addressing GHG emission reduction and climate change. Recognizing that 98% of California’s GHG emissions are from the burning of fossil fuels and 40% of all human made GHG emissions are from transportation (see Climate Action Program at Caltrans (December 2006), Caltrans has created and is implementing the Climate Action Program at Caltrans that was published in December 2006. This document can be found at <http://www.dot.ca.gov/docs/ClimateReport.pdf>.

Project Analysis

One of the main strategies in the Department’s Climate Action Program to reduce GHG emissions is to make California’s transportation system more efficient. The highest levels of CO₂ from mobile sources such as automobiles occur at stop-and-go speeds (0–25 mph) and at speeds over 55 mph. The most severe emissions occur from 0 to 25 mph (see Figure 4-2). To the extent that a project relieves congestion by enhancing operations and improving travel times in high congestion travel corridors, GHG emissions, particularly CO₂, may be reduced.



Source: Center for Clean Air Policy— <http://www.ccap.org>

Figure 4-2. Changes in CO₂ Emissions and Vehicle Speeds

The purpose of the proposed project is to reduce congestion through the I-80/I-680/SR 12 interchange complex, encourage HOV and ridesharing, improve safety, reduce cut-through traffic on local roads, and accommodate current and future truck volumes in the project area.

For a discussion of purposes, the MTC Regional Transportation Plan EIR and subsequent findings are referenced. The Department as CEQA lead agency is responsible for determining the significance of the project’s environmental impacts, including climate change. The Department has not adopted MTC’s thresholds and will use its own independent judgment in determining CEQA significance.

Operational Emissions

Future-year GHG emissions associated with implementation of the proposed project were obtained by comparing future with-project emissions to future no-project emissions for both the interim (2015) and design (2035) years. It is important to note that CO₂ emissions are useful only for a comparison between alternatives. The numbers are not necessarily an accurate reflection of what the true CO₂ emissions will be because CO₂ emissions are dependent on factors that are not part of the emissions model, such as the fuel mix³, rate of acceleration, and the aerodynamics and efficiency of the vehicles.

Future year GHG emissions associated with implementation of the project alternatives were obtained by comparing future with-project emissions to future no-project emissions for both the interim (2015) and design (2035) years. Table 4-2 presents project-level emissions and indicates that under 2015 and 2035 conditions, implementation of the build alternatives is anticipated to result in increases in CO₂ emissions, when compared to the future no-project conditions. These increases are directly attributed to increases in VMT between the no-project and with project conditions.

³ EMFAC model emission rates are only for direct engine-out CO₂ emissions, not for full fuel cycle. In addition, fuel cycle emission rates can vary dramatically depending on the amount of additives, such as ethanol, and the source of the fuel components.

Table 4-2. Project-Related Operational VMT (vehicle miles traveled per day) and GHG Emissions (metric tons per year)

Scenario	VMT	CO ₂
Existing (2004)	2,929,304	493,410
2015 No Project	4,186,260	694,836
2015 Alt B Scenario 1	4,422,276	870,093
2015 Alt C Scenario 1	4,339,525	857,141
2035 No Project	4,286,723	908,948
2035 Alt B Scenario 1	5,131,890	1,014,343
2035 Alt C Scenario 1	4,619,496	915,991
2035 Alt B	5,560,155	1,093,767
2035 Alt C	5,571,158	1,079,032
Comparison of Alternatives to Existing		
2015 Alt B Scenario 1 to Existing	1,492,972	376,683
2015 Alt C Scenario 1 to Existing	1,410,221	363,731
2035 Alt B Scenario 1 to Existing	2,202,586	520,932
2035 Alt C Scenario 1 to Existing	1,690,192	422,581
2035 Alt B - Existing	2,630,851	600,357
2035 Alt C - Existing	2,641,853	585,621
Comparison of Alternatives to No Project		
2015 Alt B Scenario 1 to 2015 No Project	236,016	175,257
2015 Alt C Scenario 1 to 2015 No Project	153,265	162,305
2035 Alt B Scenario 1 to 2035 No Project	845,167	105,395
2035 Alt C Scenario 1 to 2035 No Project	332,773	7,043
2035 Alt B - 2035 No Project	1,273,433	184,819
2035 Alt C - 2035 No Project	1,284,435	170,084

Note: Emissions calculations based on CT-EMFAC.

MTC's 2035 RTP includes performance objectives to reduce per-capita delay while improving roadway safety. As indicated in Chapter 3 of this EIR, the proposed project would help to reduce congestion by reducing vehicle hours of delay and increasing average network speed. The proposed project also includes various mitigation measures, detailed below, that will reduce the project's GHG's emissions.

Transportation accounts for 40% of the Bay Area's GHG emissions. The MTC understands the urgent need to address climate change. The MTC coordinates regional planning efforts with the BAAQMD, Association of Bay Area Governments (ABAG), the Bay Conservation and Development Commission (BCDC), as part of the Joint Policy Committee (JPC). The Transportation Climate Action Campaign within the JPC seeks to enable climate-friendly behaviors, reduce the Bay Area's carbon footprint, and lay the groundwork for ongoing future climate change initiatives (Metropolitan Transportation Commission 2009).

The EIR for MTC's 2035 RTP states that while increases in VMT over the planning period are contributing somewhat to the significant cumulative impact of global climate change, the proposed project's contribution to the significant cumulative impact of global climate change is not cumulatively considerable. MTC's RTP identifies that despite feasible mitigation, this overall cumulative impact is expected to remain significant and unavoidable because of regional growth. However, the proposed project's contribution to the overall significant cumulative impact is not cumulatively considerable.

Within the RTP are various funded regional policy efforts that address the Bay Area's contribution to global climate change, including the Bay Area Regional Agency Climate Protection Program, the Transportation Climate Action Campaign, and the Bay Area 2009 Clean Air Plan.

MTC, as part of their mitigation, commits to working with the ABAG, BCDC, and the BAAQMD, through the JPC, to develop green construction policies and best management practices that will reduce impacts related to GHG emissions. Individual projects carried out as part of the RTP shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable impacts related to climate change. These measures may include, but are not limited to, the following:

- Adopt and implement “green building” standards for any public buildings (transit stations, ferry buildings, maintenance facilities, etc) funded by MTC to achieve a U.S Green Building Council LEED Green Building rating of Silver or better or equivalent certification.
- Use light-colored pavement for solar reflectivity and reduced heat island effects wherever construction costs are no higher than 5%–10% of the least cost alternative paving material.
- Install solar photovoltaic systems or use of renewable sources of energy for transportation buildings and maintenance facilities, wherever “feasible,” as the term is defined in CEQA.
- Plant shade trees as part of specified types of construction projects or wherever construction results in loss of tree cover, because trees have carbon sequestration capacity.
- Establish or update minimum standards for construction management, including specifying minimum content for recycled products in aggregate, concrete, etc. and construction waste management.
- Establish standards or incentives for light pollution reduction related to street lighting and lighting of transportation and parking facilities to promote low energy use for permanent as well as temporary fixtures (Metropolitan Transportation Commission 2009).

As part of the Department's Climate Action Program to reduce GHG emissions, measures outlined within the Transportation and Air Quality chapters of this EIR further reduce GHG emissions from transportation projects.

There were 12 initial interchange alternatives considered. Project alternatives were screened based on the ability of each alternative to meet the proposed project's defined purpose and need, potential for environmental impacts, cost, and ability to provide adequate traffic operation improvements. Transit-oriented and non-traditional alternatives were considered, but were determined insufficient to meet the proposed project's purpose and need. A detailed description of project alternatives is discussed in Chapter 2, Project Alternatives.

In addition, there are a variety of transit services within the project study area, including intra- and inter-city bus service provided by Fairfield and Suisun Transit (FAST), Rio Vista Delta Breeze, and BayLink. Amtrak provides passenger rail service and the Capital Corridor provides commuter rail service in the study area, and FAST and the Rio Vista Delta Breeze provide transit access to and from the Suisun-Fairfield Amtrak Station. There are also existing and planned bicycle facilities within the study area, including Class I, II, and III Bikeways. Pedestrian

circulation consists primarily of sidewalks along streets and crosswalks at major intersections. These transit bicycle/pedestrian facilities serve to reduce VMT and automobile trips within the region, which help to reduce GHG emissions.

A detailed description of the transit system within the project study area is discussed in Section 3.1.6, "Traffic and Transportation/Pedestrian and Bicycle Facilities Traffic." Limitations and Uncertainties with Modeling

EMFAC

Although EMFAC calculates CO₂ emissions from mobile sources, the model has limitations in regard to accurately reflecting CO₂ emissions. According to the National Cooperative Highway Research Program report, *Development of a Comprehensive Modal Emission Model* (April 2008), studies have revealed that brief but rapid accelerations can contribute significantly to a vehicle's carbon monoxide and hydrocarbon emissions during a typical urban trip. Current emission-factor models are insensitive to the distribution of such modal events (i.e., cruise, acceleration, deceleration, and idle) in the operation of a vehicle and instead estimate emissions by average trip speed. This limitation creates an uncertainty in the model's results when the estimated emissions of the various alternatives are compared with the baseline in an attempt to determine impacts. Although work by EPA and the CARB is underway on modal-emission models, neither agency has yet approved a modal emissions model that can be used to conduct this more accurate modeling. In addition, EMFAC does not include speed corrections for most vehicle classes for CO₂—for most vehicle classes emission factors are held constant, which means that EMFAC is not sensitive to the decreased emissions associated with improved traffic flows for most vehicle classes. Therefore, unless a project involves a large number of heavy-duty vehicles, the difference in modeled CO₂ emissions due to speed change will be slight.

It is interesting to note that CARB is currently not using EMFAC to create its inventory of GHG emissions. It is unclear why the CARB has made this decision. Their website only states:

REVISION: Both the EMFAC and OFFROAD Models develop CO₂ and CH₄ [methane] emission estimates; however, they are not currently used as the basis for [CARB's] official [greenhouse gas] inventory which is based on fuel usage information. . . However, [CARB] is working towards reconciling the emission estimates from the fuel usage approach and the models.

Other Variables

With the current science, project-level analysis of GHG emissions is limited. Although a GHG analysis is included for this project, numerous key variables are likely to change dramatically during the design life of the proposed project and would thus dramatically change the projected CO₂ emissions.

First, vehicle fuel economy is increasing. EPA's annual report, *Light-Duty Automotive Technology and Fuel Economy Trends: 1975 through 2008* (<http://www.epa.gov/oms/fetrends.htm>), which provides data on the fuel economy and technology characteristics of new light-duty vehicles including cars, minivans, sport utility vehicles, and pickup trucks, confirms that average fuel economy has improved each year beginning in 2005, and is now the highest since 1993. Most of the increase since 2004 is due to

higher fuel economy for light trucks, following a long-term trend of slightly declining overall fuel economy that peaked in 1987. These vehicles also have a slightly lower market share, peaking at 52% in 2004 with projections at 48% in 2008. Table 4.3 shows the alternatives for vehicle fuel economy increases currently being studied by the National Highway Traffic Safety Administration in its Draft EIS for New Corporate Average Fuel Economy (CAFE) Standards (June 2008).

Table 4-3. National Highway Traffic Safety Administration Model year 2015 Required Miles Per Gallon by Alternative

No Action		25% Below Optimized	Optimized (Preferred)	25% Above Optimized	50% Above Optimized	Total Costs Equal Total Benefits	Technology Exhaustion
Cars	27.5	33.9	35.7	37.5	39.5	43.3	52.6
Trucks	23.5	27.5	28.6	29.8	30.9	33.1	34.7

Second, near-zero-carbon vehicles will come to the market during the design life of this project. According to a March 2008 report released by University of California, Davis Institute of Transportation Studies:

“Large advancements have occurred in fuel cell vehicle and hydrogen infrastructure technology over the past 15 years. Fuel cell technology has progressed substantially resulting in power density, efficiency, range, cost, and durability all improving each year. In another sign of progress, automotive developers are now demonstrating over 100 fuel cell vehicles (FCVs) in California—several in the hands of the general public—with configurations designed to be attractive to buyers. Cold-weather operation and vehicle range challenges are close to being solved, although vehicle cost and durability improvements are required before a commercial vehicle can be successful without incentives. The pace of development is on track to approach pre-commercialization within the next decade.

“A number of the U.S. DOE 2010 milestones for FCV development and commercialization are expected to be met by 2010. Accounting for a five to six year production development cycle, the scenarios developed by the U.S. DOE suggest that 10,000s of vehicles per year from 2015 to 2017 would be possible in a federal demonstration program, assuming large cost share grants by the government and industry are available to reduce the cost of production vehicles.”⁴

Third, and as previously stated, California has recently adopted a low-carbon transportation fuel standard. CARB is scheduled to come out with draft regulations for low-carbon fuels in late 2008, with implementation of the standard to begin in 2010.

Fourth, driver behavior has been changing as the U.S. economy and oil prices have changed. In its January 2008 report, *Effects of Gasoline Prices on Driving Behavior and Vehicle Market*, (<http://www.cbo.gov/ftpdocs/88xx/doc8893/01-14-GasolinePrices.pdf>) the Congressional Budget Office found the following results based on data collected from California:

⁴ Cunningham, Joshua, Sig Cronich, Michael A. Nicholas. March 2008. Why Hydrogen and Fuel Cells are Needed to Support California Climate Policy, UC Davis, Institute of Transportation Studies, pp. 9–10.

- 1) freeway motorists have adjusted to higher gas prices by making fewer trips and driving more slowly;
- 2) the market share of sports utility vehicles is declining; and
- 3) the average prices for larger, less-fuel-efficient models have declined over the past five years as average prices for the most-fuel-efficient automobiles have risen, showing an increase in demand for the more fuel efficient vehicles.

Limitations and Uncertainties with Impact Assessment

Taken from pages 3-48 and 3-49 of the National Highway Traffic Safety Administration Draft EIS for New CAFE Standards (June 2008), Figure 4-3 illustrates how the range of uncertainties in assessing greenhouse gas impacts grows with each step of the analysis:

Cascade of uncertainties typical in impact assessments showing the “uncertainty explosion” as these ranges are multiplied to encompass a comprehensive range of future consequences, including physical, economic, social, and political impacts and policy responses.

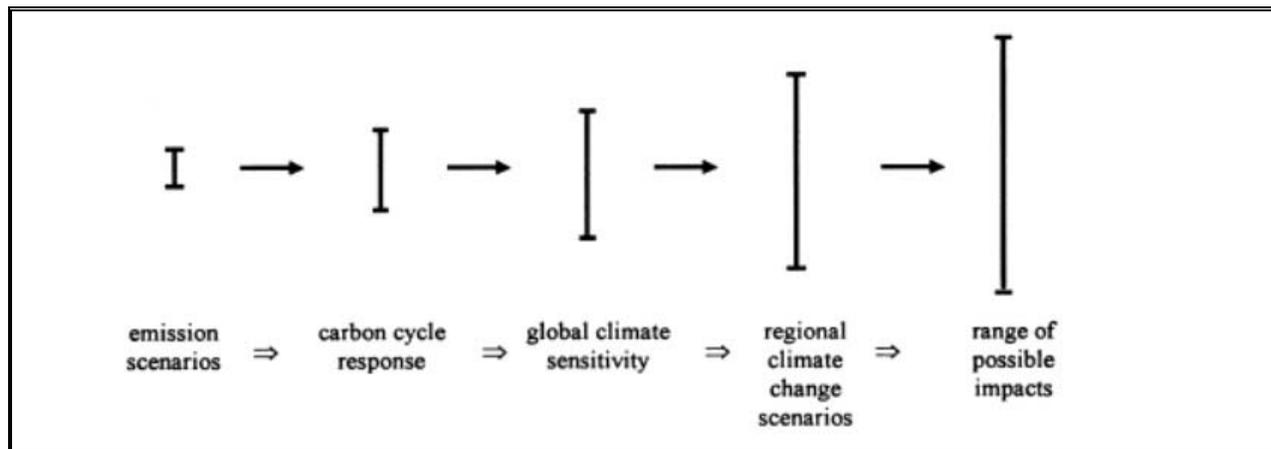


Figure 4-3. Cascade of Uncertainties

Much of the uncertainty in assessing an individual project’s impact on climate change surrounds the global nature of the climate change. Even assuming that the target of meeting the 1990 levels of emissions is met, there is no regulatory or other framework in place that would allow for a ready assessment of what the modeled 7,043 to 184,819 metric ton increase in design-year CO₂ emissions, relative to no-build conditions, would mean for climate change given the overall California GHG emissions inventory of approximately 430 million tons of CO₂ equivalent. This uncertainty only increases when viewed globally. The IPCC has created multiple scenarios to project potential future global greenhouse gas emissions as well as to evaluate potential changes in global temperature, other climate changes, and their effect on human and natural systems. These scenarios vary in terms of the type of economic development, the amount of overall growth, and the steps taken to reduce GHG emissions. Non-mitigation IPCC scenarios project an

increase in global GHG emissions by 9.7 up to 36.7 billion metric tons CO₂ from 2000 to 2030, which represents an increase of between 25% and 90%.⁵

The assessment is further complicated by the fact that changes in GHG emissions can be difficult to attribute to a particular project because the projects often cause shifts in the locale for some type of GHGs, rather than causing “new” GHG emissions. For example, the EMFAC model runs for this project were based on Solano County data. It is difficult to assess whether some of the trip increases on I-80 and I-680 are new versus whether they are transferred from surrounding areas such as Sacramento County. Although some of the emission increases might be new, the extent to which the modeled 7,043 to 184,819 metric ton increase in design-year CO₂ emissions, relative to no-build conditions represents a net global increase, reduction, or no change, is uncertain and there are no models approved by regulatory agencies that operate at the global or even statewide scale.

The complexities and uncertainties associated with project-level impact analysis are further borne out in the recently released Draft EIS for New CAFE Standards, completed by the National Highway Traffic Safety Administration June 2008. As the text quoted below shows, even when dealing with GHG emission scenarios on a national scale for the entire passenger car and light truck fleet, the numerical differences between alternatives is very small and well within the error sensitivity of the model.

In analyzing across the CAFE 30 alternatives, the mean change in the global mean surface temperature, as a ratio of the increase in warming between the B1 (low) to A1B (medium) scenarios, ranges from 0.5 percent to 1.1 percent. The resulting change in sea level rise (compared to the No Action Alternative) ranges, across the alternatives, from 0.04 centimeter to 0.07 centimeter. In summary, the impacts of the MY 2011-2015 CAFE alternatives on global mean surface temperature, sea level rise, and precipitation are relatively small in the context of the expected changes associated with the emission trajectories. This is due primarily to the global and multi-sectoral nature of the climate problem. Emissions of CO₂, the primary gas driving the climate effects, from the United States automobile and light truck fleet represented about 2.5 percent of total global emissions of all greenhouse gases in the year 2000 (EPA, 2008; CAIT, 2008). While a significant source, this is a still small percentage of global emissions, and the relative contribution of CO₂ emissions from the United States light vehicle fleet is expected to decline in the future, due primarily to rapid growth of emissions from developing economies (which are due in part to growth in global transportation sector emissions). [NHTSA Draft EIS for New CAFE Standards, June 2008, pp.3-77 to 3-78]

Construction Emissions

GHG emissions for transportation projects can be divided into those produced during construction and those produced during operations. Construction GHG emissions include emissions produced as a result of material processing, emissions produced by onsite construction equipment, and emissions arising from traffic delays due to construction. These emissions will be produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic management during construction phases. In addition, with innovations such as longer

⁵ Intergovernmental Panel on Climate Change (IPCC). February 2007. Climate Change 2007: The Physical Science Basis: Summary for Policy Makers. <http://www.ipcc.ch/SPM2feb07.pdf>.

pavement lives, improved traffic management plans, and changes in materials, the GHG emissions produced during construction can be mitigated to some degree by longer intervals between maintenance and rehabilitation events. Measures to reduce particulate, exhaust, and fugitive dust emissions described in Section 3.2.6 would reduce the severity of this impact. Table 4-4 presents the maximum emissions for each phase of construction. Total emissions per year for each phase represents the potential maximum annual emissions, while the total emissions provides an estimate of total maximum emissions associated with construction of the proposed project.

Table 4-4. Worst-Case Construction GHG Emission Estimates (Metric Tons per Year)

Construction Phase	CO ₂
Grubbing/land clearing	7,019.0
Grading/excavation	6,659.8
Drainage/utilities/sub-grade	3,153.4
Paving	2,320.5
Total	19,152.7

Note: Emissions calculations based on Road Construction Emissions Model (Version 6.3.1).

CEQA Conclusion

It is Caltrans determination that, in the absence of further regulatory or scientific information related to GHG emissions and CEQA significance, it is too speculative to make a determination regarding the project’s direct impact and its contribution on the cumulative scale to climate change. However, Caltrans is firmly committed to implementing measures to help reduce the potential effects of the project. These measures are outlined in the following section.

AB 32 Compliance

Caltrans continues to be actively involved on the Governor’s Climate Action Team as CARB works to implement the Governor’s Executive Orders and help achieve the targets set forth in AB 32. Many of the strategies the Department is using to help meet the targets in AB 32 come from the California Strategic Growth Plan, which is updated each year. Governor Arnold Schwarzenegger’s Strategic Growth Plan calls for a \$238.6 billion infrastructure improvement program to fortify the state’s transportation system, education, housing, and waterways, including \$100.7 billion in transportation funding through 2016. As shown in Figure 4-4, the Strategic Growth Plan targets a significant decrease in traffic congestion below today’s level and a corresponding reduction in GHG emissions. The Strategic Growth Plan proposes to do this while accommodating growth in population and the economy. A suite of investment options has been created that combined together yield the promised reduction in congestion. The Strategic Growth Plan relies on a complete systems approach of a variety of strategies: system monitoring and evaluation, maintenance and preservation, smart land use and demand management, and operational improvements.

As part of the Climate Action Program at Caltrans (California Department of Transportation 2006), Caltrans is supporting efforts to reduce vehicle miles traveled by planning and implementing smart land use strategies: job/housing proximity, developing transit-oriented

⁶ Governor’s Strategic Growth Plan, Fig. 1 (<http://gov.ca.gov/pdf/gov/CSGP.pdf>).

communities, and high density housing along transit corridors. While Caltrans is working closely with local jurisdictions on planning activities, Caltrans does not have local land use planning authority. Caltrans is also supporting efforts to improve the energy efficiency of the transportation sector by increasing vehicle fuel economy in new cars, light and heavy-duty trucks; Caltrans is doing this by supporting ongoing research efforts at universities, by supporting legislative efforts to increase fuel economy, and by its participation on the Climate Action Team. It is important to note, however, that the control of the fuel economy standards is held by EPA and CARB. Lastly, the use of alternative fuels is also being considered; Caltrans is participating in funding for alternative fuel research at the UC Davis.

Table 4-5 summarizes agency and statewide efforts that Caltrans is implementing in order to reduce GHG emissions. For more detailed information about each strategy, please see California Department of Transportation 2006.

Table 4-5. Climate Change Strategies

Strategy	Program	Partnership		Method/Process	Estimated CO ₂ Savings (MMT)	
		Lead	Agency		2010	2020
Smart Land Use	Intergovernmental Review (IGR)	The Department	Local Governments	Review and seek to mitigate development proposals	Not Estimated	Not Estimated
	Planning Grants	The Department	Local and regional agencies and other stakeholders	Competitive selection process	Not Estimated	Not Estimated
	Regional Plans and Blueprint Planning	Regional Agencies	The Department	Regional plans and application process	0.975	7.8
Operational Improvements & Intelligent Trans. System (ITS) Deployment	Strategic Growth Plan	The Department	Regions	State ITS; Congestion Management Plan	.007	2.17
Mainstream Energy & GHG into Plans and Projects	Office of Policy Analysis & Research; Division of Environmental Analysis	Interdepartmental effort		Policy establishment, guidelines, technical assistance	Not Estimated	Not Estimated
Educational & Information Program	Office of Policy Analysis & Research	Interdepartmental, CalEPA, CARB, CEC		Analytical report, data collection, publication, workshops, outreach	Not Estimated	Not Estimated
Fleet Greening & Fuel Diversification	Division of Equipment	Department of General Services		Fleet Replacement B20 B100	0.0045	0.0065 0.45 .0225
Non-vehicular Conservation Measures	Energy Conservation Program	Green Action Team		Energy Conservation Opportunities	0.117	.34
Portland Cement	Office of Rigid Pavement	Cement and Construction Industries		2.5 % limestone cement mix 25% fly ash cement mix > 50% fly ash/slag mix	1.2 .36	3.6
Goods Movement	Office of Goods Movement	Cal EPA, CARB, BT&H, MPOs		Goods Movement Action Plan	Not Estimated	Not Estimated
Total					2.72	18.67

To the extent that it is applicable or feasible for the project alternatives and through coordination with the project development team, the following measures will also be included in the project alternatives to reduce the GHG emissions and potential climate change impacts:

- The project will incorporate the use of energy-efficient lighting, such as LED traffic signals. LED bulbs—or balls, in the industry vernacular—cost \$60 to \$70 apiece but last 5–6 years, compared to the 1-year average lifespan of the incandescent bulbs previously used. The LED balls themselves consume 10% of the electricity of traditional lights, an additional reduction of the project’s CO₂ emissions.
- According to the Department’s Standard Specification Provisions, idling time for lane closure during construction is restricted to ten minutes in each direction; in addition, the contractor must comply with BAAQMD rules, ordinances, and regulations regarding air quality restrictions.
- The project will incorporate the use of reclaimed water whenever feasible. Currently, 30% of the electricity used in California is used for the treatment and delivery of water. Use of reclaimed water helps conserve this energy, reducing GHG emissions from electricity production.
- The use of lighter color surfaces, such as Portland cement, helps to reduce the albedo effect and cool the surface; in addition, the Department has been a leader in the effort to add fly ash to concrete mixes. Adding fly ash reduces the GHG emissions associated with concrete production; it also can make the pavement stronger.

Adaptation Strategies

Adaptation strategies refers to how The Department and others can plan for the effects of climate change on the state’s transportation infrastructure and strengthen or protect the facilities from damage. Climate change is expected to produce increased variability in precipitation, rising temperatures, rising sea levels, storm surges and intensity, and the frequency and intensity of wildfires. These changes may affect the transportation infrastructure in various ways, such as damaging roadbeds by longer periods of intense heat; increasing storm damage from flooding and erosion; and inundation from rising sea levels. These effects will vary by location and may, in the most extreme cases, require that a facility be relocated or redesigned. There may also be economic and strategic ramifications as a result of these types of impacts to the transportation infrastructure.

Climate change adaption must also involve the natural environment as well. Efforts are underway on a statewide-level to develop strategies to cope with impacts to habitat and biodiversity through planning and conservation. The results of these efforts will help California agencies plan and implement mitigation strategies for programs and projects.

On November 14, 2008, Governor Schwarzenegger signed Executive Order S-13-08 which directed a number of state agencies to address California’s vulnerability to sea level rise caused by climate change.

The California Resources Agency (now the Natural Resources Agency [Resources Agency]), through the interagency Climate Action Team, was directed to coordinate with local, regional, state and federal public and private entities to develop a state Climate Adaptation Strategy. The Climate Adaptation Strategy will summarize the best known science on climate change impacts to California, assess California's vulnerability to the identified impacts and then outline solutions that can be implemented within and across state agencies to promote resiliency.

As part of its development of the Climate Adaptation Strategy, Resources Agency was directed to request the National Academy of Science to prepare a *Sea Level Rise Assessment Report* by December 2010 to advise how California should plan for future sea level rise. The report is to include:

- Relative sea level rise projections for California, taking into account coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge, and land subsidence rates.
- The range of uncertainty in selected sea level rise projections.
- A synthesis of existing information on projected sea level rise impacts to state infrastructure (such as roads, public facilities and beaches), natural areas, and coastal and marine ecosystems.
- A discussion of future research needs regarding sea level rise for California.

Furthermore, Executive Order S-13-08 directed the Business, Transportation, and Housing Agency to prepare a report to assess vulnerability of transportation systems to sea level affecting safety, maintenance and operational improvements of the system and economy of the state. The Department continues to work on assessing the transportation system vulnerability to climate change, including the effect of sea level rise.

Prior to the release of the final Sea Level Rise Assessment Report, all state agencies that are planning to construct projects in areas vulnerable to future sea level rise were directed to consider a range of sea level rise scenarios for the years 2050 and 2100 in order to assess project vulnerability and, to the extent feasible, reduce expected risks and increase resiliency to sea level rise. However, all projects that have filed a Notice of Preparation, and/or have funds programmed for construction in the next five years (through 2013), or are routine maintenance projects as of the date of Executive Order S-13-08 may, but are not required to, consider these planning guidelines. Sea level rise estimates should also be used in conjunction with information regarding local uplift and subsidence, coastal erosion rates, predicted higher high water levels, storm surge and storm wave data. (Executive Order S-13-08 allows some exceptions to this planning requirement.)

Climate change adaptation for transportation infrastructure involves long-term planning and risk management to address vulnerabilities in the transportation system from increased precipitation and flooding; the increased frequency and intensity of storms and wildfires; rising temperatures; and rising sea levels. The Department is an active participant in the efforts being conducted as part of Governor's Schwarzenegger's Executive Order on Sea Level Rise and is mobilizing to be able to respond to the National Academy of Science report on Sea Level Rise Assessment, which is due to be released by December 2010.

On August 3, 2009, the Natural Resources Agency, in cooperation and partnership with multiple state agencies, released the 2009 California Climate Adaptation Strategy Discussion Draft, which summarizes the best known science on climate change impacts in seven specific sectors and provides recommendations on how to manage against those threats. The release of the draft document set in motion a 45-day public comment period. Led by the California Natural Resources Agency, numerous other state agencies were involved in the creation of discussion draft, including Environmental Protection; Business, Transportation and Housing; Health and

Human Services; and the Department of Agriculture. The discussion draft focuses on sectors that include: Public Health; Biodiversity and Habitat; Ocean and Coastal Resources; Water Management; Agriculture; Forestry; and Transportation and Energy Infrastructure. The strategy is in direct response to Gov. Schwarzenegger's November 2008 Executive Order S-13-08 that specifically asked the Natural Resources Agency to identify how state agencies can respond to rising temperatures, changing precipitation patterns, sea level rise, and extreme natural events. As data continues to be developed and collected, the state's adaptation strategy will be updated to reflect current findings. A revised version of the report was posted on the Natural Resource Agency website on December 2, 2009; it can be viewed at <http://www.energy.ca.gov/2009publications/CNRA-1000-2009-027/CNRA-1000-2009-027-F.PDF>.

Currently, the Department is working to assess which transportation facilities are at greatest risk from climate change effects. However, without statewide planning scenarios for relative sea level rise and other climate change impacts, the Department has not been able to determine what change, if any, may be made to its design standards for its transportation facilities. Once statewide planning scenarios become available, the Department will be able review its current design standards to determine what changes, if any, may be warranted in order to protect the transportation system from sea level rise.

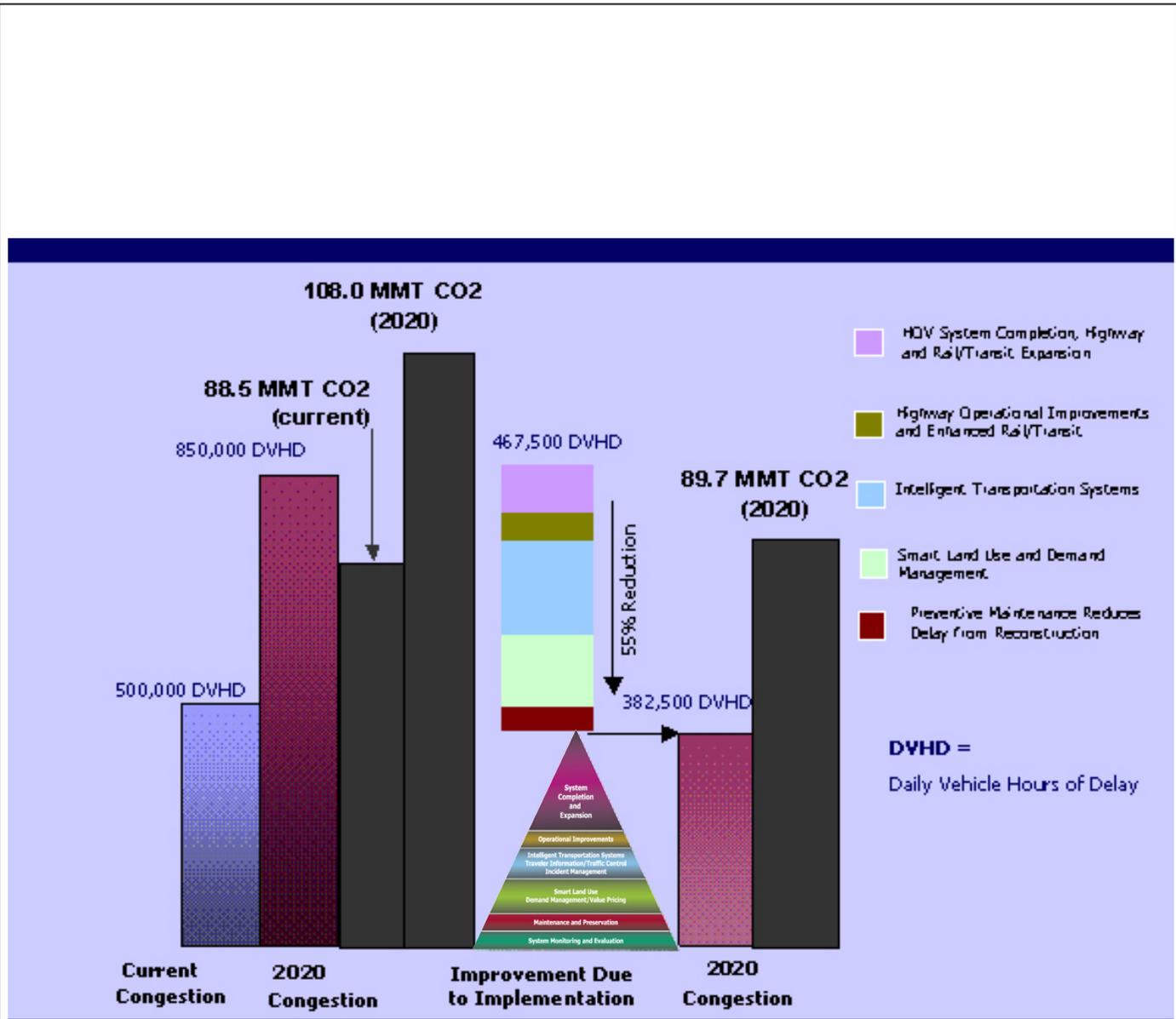
The proposed project had a Notice of Preparation filed and has funds programmed for construction in the next five years (through 2013). Therefore, no further analysis is mandated.

4.2.7 Mitigation Measures for Significant Impacts under CEQA

Table 4-6 summarizes mitigation measures for significant impacts under CEQA. Although mitigation is presented for conversion of farmland to non-agricultural use, these measures would not reduce the impact to a less-than-significant level.

Table 4-6. Significant Impacts and Mitigation Measures under CEQA

Potentially Significant Impacts	Mitigation Measures
Conversion of farmland to non-agricultural use Conflict with existing agricultural zoning or a Williamson Act contract	To mitigate impact to important farmland (those lands classified as "prime farmlands"), long-term land use restrictions such as agricultural conservation easements shall be obtained over Prime Farmland within Solano County at a 1:1 ratio (1 acre protected for every one acre directly affected). Lands under an agricultural conservation easement are considered to have higher agricultural value than other agricultural land in the project area. As such, the mitigation for the loss of lands under easement will be implemented at a higher ratio of 1.25:1.
Adverse physical effects on the environment associated with construction or expansion of recreational facilities	Refer to mitigation presented above for conversion of agricultural land to non-agricultural uses.



Conceptual Framework for Reducing Congestion that Needs to be Verified Through Experience

* Numbers reflect SHWY system

**Figure 4-4
Outcome of Strategic Growth Plan**

